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FACULTY OF SCIENCE/MEDICINE/ENGINEERING

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA
2015 POST-UTME SCREENING EXERCISE ENGLISH LANGUAGE

Fill out the gaps in the passage below with the correct option from the list provided in brackets in front of the gaps.

1._____ (a. jargon   b. vernacular   c. dialects d. wazobia) is specialized language that appears in a non-specialized context, thus giving a 2. _____ (a. generalized b. technical   c. restricted   d. straightforward) flavor to statements that would be better 3. _____ (a. addressed b. written   c. expressed d. spoken) in everyday words. When you are writing a 4. _____ (a. paper b. document c. treatise d. pamphlet) in, say, economics, anthropology, or psychology, you can and should use terms that are meaningful within the 5. _____ (a. pool b. conundrum c. register d. field) cash flow, kinship structure, paranoid, and so forth. But those same terms become jargon when used out of 6. _____ (a.   place   b.   meaning   c.   contest   d.   context).

Choose the option nearest in meaning to the italicized words in the following sentences.

7. He cannot hide his *aversion* for Kemi's unrepentant behavior. (a) abhorrence   (b) sadness (c) ignominy (d) moodiness.

8. The *investments* in stocks seemed to have gone down the drain with this meltdown in the banking sector (a) businesses (b) capital (c) surplus (d) dividends.

9. My efforts at making her to see my point were *rebuffed*. (a) embraced   (b) antagonized   (c) snubbed   (d) dividends.

10. He is a *lout* and can't be relied upon at all   (a) vagabond (b) thug (c) unserious (d) liar.

11. The undisputed boxer was quite a *mouthful* for his opponent. (a) not a match   (b) undeleated (c) evenly match (d) boastful.

12. Such stories are difficult to belive because they are *make-belief* (a) lies (b) vituperations   (c) genuine (d) fantasy.

13. I am all those who mistook President Buhari's _____ demeanour for cowardice will soon know him for who he actually is (a) stealthy (b) sloppy (c) snaky (d) succulent.

Choose the most appropriate option to complete the gaps in the following sentences.

14. The new inspector General of Police will alleged that terrorists had _____ the rank and file of the force (a) proliferated   (b) conquered   (c) infiltrated   (d) insulated.

15. He lay awake, his whole body _____ sleep (a) acting for (b) looking for (c) drumming for (d) aching for.

16. Please think _____ everything and let me have your answer tomorrow. (a) thoroughly   (b) through   (c) around (d) on.

17. I asked you _____   (a) when you are going to get marry   (b) the time when you are goint to get marry (c) at what point you are getting married (d) when you were going to get married.

Choose from the options A-D the word <u>opposite in meaning</u> to the underlined word.

18. I guess he is <u>indifferent</u> to our plans to rid Nigeria of societal ills.   (a) interested in   (b) opposed to   (c) bothered (d) not interested in.

19. The increase in transportation cost <u>imperiled</u> my sister's plant to travel this month. (a) propelled   (b) restricted (c) disturbed (d) hoodwinked.

20. The criminal's answers to the questions during interrogation were <u>evasive</u> (a) harsh   (b) outspoken (c) clever (d) direct.

Read the passage below and answer the questions under it.

Among his papers, there is the farewell lecture given in 1925 when he retired from his Copenhagen chair at the age of 65 ____ protesting himself 'an old fogey', though English studies were fortunate that so youthfully creative a 'fogey' was to go on writing for almost a further two decades. In the splendid apologia, he explained that for him 'linguistic investigation' involved primarily 'understanding the texts....to penetrate into the innermost thoughts of the best men arid women.' 'Speech is the noblest instrument to bind man to man, and... it is by speech as by literature, or best by both combined, that one comes to understanding the people from whom they emanated.' First and foremost, of course, a student of language, he insisted on studying language at its best and in that way he hoped, he says, 'to have imparted to my hearers some of my own enthusiasm for the great poets.

My greatest enjoyment, and no doubt that of my hearers as well, has been in my Chaucer classes, partly becaue Chaucer has such a wonderful power of describing human beings.' So far from confining himself to expounding linguistic history for its own sake, he sees his work as 'combating mark' of which 'is antipathy', disdain, finally hatred'. 'Especially now since the World-war this is a task of the greatest importance, sicne it is necessary that the wounds of this gruesome time sould be healed.' Thus he spoke to his students in 1925. Sadly, this noble friend of mankind was to see a still more gruesome manifestation of nationalism and to die in 1943 when his country had already suffered for some years the horrors of the Nazi occupation, when there was little opportunity 'to diffuse knowledge and love of what is best in other peoples'.

21. Another word used in the passage that can serve as a synonym to 'ghastly' is _____ (a) exponding (b) essential   (c) splendid (d) gruesome.

22. The figure of speech used by the writer in 'though English studies were fortunate that so youthfully creative a 'fogey'   was to go on writing for almost a further two decades' in describing the person being talked about is _____ (a)   hyperbole (b) irony (c) innuendo (d) sarcasm.

23. The writer believes that _____ (a) human beings are best understood by what they say or by what is written   about them (b) human beings are very difficult to penetrate in a linguistics investigation (c) the innermost   thoughts of all men and women are the major preoccupations of linguistis (d) literature and language are combined   in any worthwhile linguistic enquiry to understand human beings.

24. According to the writer, he derived greatest enjoyment in (a) Chaucer, the great personality he befriended when he   was in school (b) the profound ideas expounded by his teachers while he was in school (c)

series of lectures he received about Chaucer and his writings (d) the wonderful ways his teacher described human beings in many of his lectures.

25. We can categorically pinpoint on the passage that the writer was talking about _____ (a) a former student of his who is intelligent (b) disturbing trend in linguistic study (c) distinguished scholar who had impacted positively on the field of discussion (d) the ghastly malady of out time, nationalsim', 'the essential mark' of which 'is antipathy, disdain, finally hatred.'

ANSWERS TO 2015 ENGLISH LANGUAGE
1.A 2. C 3. C 4.A 5. D 6.D 7.A 8.A 9.C 10.B 11.B 12.D 13.A 14.C 15.D 16.B 17.D 18.A 19.A 20.D 21.D 22.D 23.D 24.C 25.C

OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA
2014 POST-UTME   AUGUST 2,2014 SCREENING EXERCISE ENGLISH LANGUAGE

Read the passage and use it to answer question 1-4

As we both fed our eyes wistfully at the used under-wear section, Vivian noticed a heap of women's underwear, a mixture of braziers of various sizes and designs, panties, g-strings and tongs, underskirts, lingerie of different colours, all heaped and scattered on a big bedspread like a pile of rubbish. Some were quite ancient and threadbare, while a few appeared not to have suffered much oppression in the hands and private parts of their previous owners. It was apparent that the international businessman who imported such inglorious assortment had agent with prongs, long enough to dip deep into deepest and farthermost refuse bins and dumps of Europe to be able meet the demand back home.

1. We can infer from the passage above that
A. the effort of international businessmen were commended by the writer for their contribution to Nigeria's economy
B. the writer believes that Nigerian government has not been doing enough to encourage importers of goods to remain in business and recoup money they have invested in their business
C. The writer makes comic comments on the porous Nigerian borders through which contraband goods are imported into the country D.the writer subtly castigates and derides the patronage of substandard goods that dots the Nigerian market in the name of imported goods

2. "...all heaped and scattered on a big bedspread like a pile of rubbish" The figure of speech used in that quotation is A. metaphor B. simile C. hyperbole D.pun

3. It was apparent that the international businessman who imported such inglorious assortment had agents with prongs, long enough to dig deep into the deepest and farthermost refuse bins and dumps of Europe to be able to meet the demand back home. From the quotation above, it is apparent that the writer is being A. metaphorical B. categorical C.sarcastic D. specific

4. Another word that means the same as the word 'threadbare' as it is used in the passage is ....
A.worn-out B. dirty C. expensive D. cheap

Choose the most appropriate option from a-d to complete the gaps in the following sentences.

5. While the host community was condemned roundly by their hostility, the visiting contingent was applauded for their A.friendliness
B. hospitality C. dexterity C. methodology

6. It is hard to quantify the ____ that the abducted Chibok girls would have gone through since they were taken away by the dreaded Boko Haram insurgents. A.rape B. trauma C. isolation D. insecurity

7. The high-profile witness has been discredited having been accused of being ____ with the truth in his testimony A. biological B.geographical C. circumventing D.economical

8. The jailed businessman has left his family in ____ due to the confiscation of his property by the government A. bliss B. quandary C. opulence D. Eldorado

9. The Federal Government has expressed the fear that the violent activity of the insurgents may ____ if powerful foreign assistance is not received soon. A. extrapolate B. proliferate C. metamorphose D.escalate

10. I am sure that if you probe further, the accused person will reveal where the ____ money is kept. A. pilfered B. missed C. lost D. robbed

11. I was waving frantically but you drove ____ me A. past B. pass C. passed D. passing

12. The driver was reckless, the road was slippery due to the early morning downpour, and ____ there was a crash that claimed two lives A. frantically B. subsequently C. constantly D. unequivocally

13. Did you know we were very fortunate to run __ for the newly elected president of the country when he was campaigning for the office?
A. errant B. errands C.an errand D. around

Choose the option nearest in meaning to the italiced words in the sentences below

14. The *erratic* power supply these days has caused a lot of damage to household items that use electricity. A. lackadaisical B. regular C. uneven D. high-voltage

15. "You need to go and study the *etymology* of the underlined words in the returned essay," the lecturer told the student. A. meaning B. technicality C. originality D. origin

16. The man told him point blank that his argument was bereft __ sound reasoning. A. with B. of C. in D.off

17. The workers expressed their heartfelt thanks ____ the management for the notable improvement to their conditions of service
A. toward B. with C. towards D. to

18. He won the elections but many people were killed by his thugs, and thus many said his was a ____ A. Philistine victory B. pyrrhic victory C. crocodile victory D. pseudo victory

19. The aspirant for the highest office in the coming elections has started distributing live cows to each electorate in his ward; but some rejected it because they considered it a ____ A. an Eldorado gift B. Grievous gift C. Greece gift D. Greek gift

Fill out the gap in the passage below with the correct option from the list provided in brackets in front of the gaps

__20__. is specialized language, that appears in a non-specialized context, thus giving a __21__ flavour to statements that would be better __22__ in everyday words. When you are writing __23__ in, say, economics, anthropology, or psychology, you can and should use terms that are meaningful within the __24__ cash flow, *kinship* structure, paranoid, and so forth. But those same terms become jargon when used out of __25__.

20. A. jargon B. Vernacular C. Dialects D. Wazobia

21. A.Generalized   B. Technical   C. Restricted   D. straightforward
22. A.Addressed B. Written C. Expressed D. Spoken
23. A.Paper B. Document C.Treaties D.Pamphlet
24. A.Pool B. Conundrum C. Register D. Field
25. A. Place B. Meaning C. Contest D. Context.

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA.
2013 POST-UTMEENGLISH LANGUAGE.   Passage

All over the world till lately, and in most of the world still today, mankind has been following the course of nature that is to say, it has been breeding up to the maximum. To let nature take her extravagant course in the reproduction of the human race may have made sense in an age in which we were also letting her take her course in decimating mankind by the casualties of war, pestilence, and famine. Being human, we have at last revolted against that senseless waste. We have started to impose on nature's heartless play a humane new order of our own. But when once man has begun to interfere with nature, he cannot afford to stop half way. We cannot, with impunity, cut down the death rate and at the same time allow the birth-rate to go on taking nature's course. We must consciously try to establish equilibrium or, sooner or later, famine will stalk abroad again.

Now answer the following questions.

1. The author observes that A. war, pestilence and famine were caused by the extravagance of nature B. it was wise at a time when mankind did not interfere with normal production C. nature is heartless and senseless D. there was a time when uncontrolled birth made sense.
2. Which of these statements does not express the opinion of the author? A. many people had died in the past through want and disease B. mankind should not have the maximum number of children possible C. mankind has started to interfere with the work of nature D. Man's present relationship with nature in matters of birth and death is a happy one.
3. 'humane' as used in the passage means A. wise B. human C. benevolent D. sensible
4. 'We must consciously try to establish an equilibrium', in the passage implies that mankind must A. strive not to be wasteful B. realistically find an equation C. purposely find a balance D. deliberately try to fight nature
5. The main idea of this passage is that A. nature is heartless B. man should control the birth-rate C. man should change nature's course gradually D. pestilence causes more deaths than war.

In each of questions 6- 8, choose the option nearest in meaning to the word(s) or phrase in italics.
6. Nobody could say precisely when the landlord became a *recluse* A. loner B. drunkard C. nincompoop D. cantankerous
7. If I had known his delicate state of mind, I would not have *broached* the matter A. told them B. divulged C. brought up D. cancelled
8. Don't talk like that; you know the Professor will not entertain such *vituperative* remarks A. irresponsible B. insulting C. angry D. illiterate

In each of questions 9-11, choose the most appropriate option opposite in meaning to the word or phrases in Italics.
9. He has been advised to beware of political *jobbers* if he hopes to succeed A. neophytes B. masquerades C. stockbrokers D. masterminds
10. What a *tangled* web we weave, when we try to deceive! A. complicated B. crooked C. simple D. loose
11. She devoted too much time to the *peripheral* aspects A. superficial B. minor C. main D. real

In each 4 questions 12-16, fill each gap with the most appropriate option from the list provided.
12. My daughter would become _____ if I paid no attention to her behaviour A. rhascally B. rhapsodically C. rascally D. rascality

13. When the soldiers saw that resistance was_____ they stopped fighting A. inadvertent B. futile C. inappropriate D. insurmountable
14. The last time the man saw his ex-wife, she _____ A. was thinking of a proposal of starting a new business B. was intending to start a new business C. intended to start a new business D. was going to start a new business.
15. Two days before the execution, the robber was taken to the place where he would be _____With doleful eyes, he looked at the spot where his execution____ A. hunged/was to be taken place B. hanging/shall take place C. hung/would take place D. hanged/was to take place
16. Don't _____!, said the leader, 'I want a decision now A. prevaricate B. predicate C. precipitate D. be pejorative

For question 17, choose the letter which contains the correct phonetic symbol in the underlined sounds below.
17. Women A. /l/ B. /e/ C. /ou/ D. /u/
For question 18, choose the word which contains the correct sound as given in each of the sound below.
18. /v/ A. off B. fan C. of D. four

In each of questions 19 and 20, choose the option that best completes the gap(s)
19. The car owner does not think about the .... of his vehicle and other payments involved in owning it A. transportation B. depreciation C. calculation D. appreciation
20. We shall offer a good job to a .... to register guests in the Central Hotel. A. waiter B. watchman C. cashier D. receptionist

In questions 21 and 22, fill in the right word or phrase
21. There is not .... sense in what that politician has just said. A. many B. plenty C. lot of D. much
22. I'm sorry I can't give you any of the oranges, I have ... left. A. few B. little C. only a little D. a few

Fill in the gaps in the following sentences with appropriate preposition
23. Lawrence did not win the contract .... the long run A. at, B. in, C. on, D. to
24. Memuna was careful not to fall .... Ameen's tricks A. into B. for C. in D. with
25. The Commander had placed his troop .... alert A. in, B. on, C. at, D. over

ANSWERS TO ENGLISH LANGUAGE 2013

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA.
2012 POST-UTME SCREENING EXERCISE   ENGLISH LANGUAGE

Choose the correct options to fill the gaps in the three questions below.

1. I don't understand *what exactly you were saying*. What is the name of the subordinate clause in this sentence? (a) Adverbial Clause (b) Nominal Clause (c) Adjectival Clause (d) Interrogative Clause

2. Are you going to Lagos____your car? (a) with (b) in (c) through (d) by

3. Another name for a relative clause is _____ (a) Adverbial clause (b) Infinitive Clause (c) Adjectival Clause (d) Relational Clause

Choose from the options A-D the word or phrase that is nearest in meaning to the word underlined.

4. My efforts at making her to see my point were <u>rebuffed</u>. (a) embraced (b) antagonized (c) snubbed (d) successful

5. He is a <u>lout</u> and can't be relied upon at all. (a) shifty (b) thug (c) unserious (d) liar

6. The speech was delivered with great <u>trepidation</u>. (a) fear (b) dexterity (c) power (d) creativity

7. He cannot hide his <u>aversion</u> for Kemi's unrepentant behaviour. (a) Abhorrence (b) sadness (c) ignominy (d) moodiness

8. My sister is known by everybody to be <u>scurrilous</u>. (a) pleasant (b) vituperative (c) active (d) inactive

Choose from the options A-D the word opposite in meaning to the underlined word.

9. The criminal's answers to the questions during interrogation were <u>evasive</u>. (a) harsh (b) outspoken (c) clever (d) direct

10. I guess he is <u>indifferent</u> to our plans to rid Nigeria of societal ills. (a) interested in (b) bothered (c) opposed to (d) not interested in

11. The girl is very <u>somber</u> in her style of dressing. (a) solemn (b) pleasant (c) provocative (d) exposing

Select from the options A-D the correct meaning of the idiom underlined.

12. The manager behaved as if he <u>had bats in the belfry</u>. (a) he was pleasant (b) he had strange ideas (c) he was speechless (d) he was angry

13. I learnt Agnes was <u>off colour</u> this morning. She was not in class. (a) busy somewhere else (b) not able to wake up early enough (c) not in her right mind (d) not in good health

Fill in the spaces in the passage below with the appropriate words.

One needs to observe the __14__ of the __15__ to appreciate how interesting it can be. I witnessed a land __16__ many years back. The __17__ had __18__ those who sold him a piece of land to court for __19__ on his land. Appearing for the defendants the __20__ argued that the land had been lying untouched for over thirty years and had become a hideout for social miscreants.

	A	B	C	D
14.	Work	proceedings	hearing	Working
15.	Law	document	War	Ruling
16.	Quarrel	Law	Matter	Case
17.	Plaintiff	defendant	Accused	criminal
18.	Arrested	Sued	Fought	prosecuted
19.	Trespassing	claiming	Building	working
20.	legal luminary	plaintiff	Defence Counsel	Criminal

Choose from the options A-D the appropriate verb that best completes the following sentences.

21. Although she suffered a lot of hardship she still ___(a) gloated (b) glowed (c) flowed (d) splashed

22. Our plane _____ down at Aminu Kano international Airport at exactly 12 midnight. (a) landed (b) descended (c) got (d) touched

23. The disease was _____ very rapidly in the community. (a) widening (b) catching people (c) spreading (d) raging

Choose from the options A-D the correct spelling.

24. (a)embaras (b) embarass (c) embarras (d) embarrass

25. (a) conterfit (b) contertiet (c) counterfeit (d) counterteet

ANSWERS TO ENGLISH LANGUAGE 2012

1B 2A 3C 4B 5A 6A 7A 8B 9D 10A 11D 12B 13C 14B 15A 16D 17A 18B 19A 20C 21B 22B 23C 24D 25C

OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA
2011 POST-UTME SCREENING EXERCISE -USE OF ENGLISH

Passage 1

The privilege of blackening one's stool is not granted to every dead chief or queen-mother without conditions. The honour is merited only on the fulfilment of certain conditions on the part of the occupant of a stool. The blackening of a king's stool is regarded as the greatest honour that could be conferred on a ruler; thus in many Akan states only the stools of kings who proved to be true leaders are blackened.

No royal person's stool is reserved unless he died while still a ruler. A destooled chief is the last person whose memory anybody wants to keep fresh. He must have broken a taboo or committed a serious crime to merit his degradation. He may have committed adultery with his servants' wives; he may have bought and sold slaves, who are considered as heirlooms to the stool; he may have used the oath unreasonably; he may have cursed people. All these crimes can deprive a chief of his regal powers. Once this happens, he becomes, in the eyes of the people, more insignificant than a commoner who has no right whatever to be a chief.

However, a chief may 'die on the stool', and yet not have his stool blackened. This is so because one must die a 'good death'. Sudden death through an accident destroys the right to have one's stool blackened. So does death through an unusual disease like leprosy, lunacy, epilepsy and dropsy — which, if discovered in time, are causes for destoolment. The only exception here is death in war which magnifies one's fame and dignity. But even here, if it is found out that one fell when retreating, or running away, from the enemy, one is regarded as a treacherous and infamous leader who should be erased from all historical memory. A chief who suffered from an unclean disease, but got cured before dying, is said to have been engaged in a personal difficult war with the disease and emerged triumphant. Such a chief is worthy of respect. Suicide is, perhaps, one of the worst deaths a chief could undergo. Under no condition whatever will the stool of a ruler

who takes his own life, or is killed by a 'fetish' be consecrated

Answer the following questions on the passage

1. Which of the following is true according to the passage? (a). it is entirely up to the chief whether or not his stool will eventually be blackened(b). it is partly up to him, partly due to circumstances beyond his control (c). it is entirely due to circumstances beyond his control (d). it depends entirely on people's opinion of him during his lifetime

2. A destooled chief can be correctly defined as (a). a chief who has committed crimes (b). a chief who was removed during his reign (c). a chief who has broken taboos (d). a chief who is more insignificant than a commoner

3. What is meant by 'die on the stool'? (a). dying a miserable and unworthy death (b). dying as a reigning ruler (c). dying while on stool in the palace (d). dying after a disease of stooling

4. Which of the following is the most suitable title for the passage? (a). reasons for destoolment (b). how to live a worthy life by an Akan ruler (c). an aspect of traditional custom of the Akan people (d). stool blackening by the royal personages

5. The most basic condition that qualifies anybody for stool darkening is (a). dying a worthy death (b). having being crowned as a ruler (c). being a ruler with tangible achievements(d).having respect for traditional customs

In the following sentences, choose the option that is most nearly opposite to the underlined word.

6. In any group there are people who display apathy (A. enthusiasm B. patience C. respect D. tolerance).

7. Femi was very open about his ambition (A. silent B. withdrawn C. closed D. secretive).

8. Angela is very indolent. (A. perfect B. devoted C. diligent D. trustworthy).

9. Rather than support the chairman, Olu slept off. (A. deny B. oppose C. doubt D. back).

10. Ngozi's beauty is natural (A. unnatural B. artificial C. awkward D. fake).

Passage 2
The passage below has gaps numbered 11 to 20. Immediately following each gap, four options are provided. Choose the most appropriate option for each gap.

Coach Samson Siasia has asked that Heartland be paid their ___11___ salaries and___12___ so as to ___13___ them to victory against Al-Ahly of Egypt in Sunday's all-important CAF Championships League match. Heartland are third in Group B with four points ___14___ as many matches and need to ___15___defeat at second-placed Al-Ahly to stay in the ___16___for a place in the semi-final of Africa's most prestigious club competition. Siasia told MTN Football.com

that the team would be better motivated if they at least receive their August salaries before the Al-Athly ___17___. We have to make sure that they are paid their salaries ___18___ so that they could play the game of their lives. The government has done very well, but it will be a big morale ___19___to get paid for them to go out there and play. Siasia informed MTNFootbafl.com that Heartland plan to employ the counter ___20___ to get a result in Cairo.

11. A. left over B. outstanding C. owed D. late
12. A. match bonuses B. match payments C. match wages D. match fees
13. A. push B. instigate C. spur D. move
14. A. from B. in C. at D. with
15. A. afford B. annul C. avoid D. afford
16. A. focus B. centre C. running D. front
17. A. show B. showdown C. show up D.blow out
18. A to time B. for time C. as due D. as and when due
19. A. boomer B. inspirer C. booster D. pusher
20. A. attack B. attacker C. getter D. goal

For questions 21 -23, choose the best options from letters a – d that best summarises the information contained in the underlined sentence.

21. In an answer to the question as to how life is treating him, the politician said it never rains but it pours.
    a. things are getting decidedly worse.
    b. his financial status is deteriorating.
    c. the blessings of life shower on him like a heavy rain.
    d. he is contented with improved fortunes.

22. Camilla waited for her friend in the library for a good hour.a. Camilla enjoyed the sixty minutes she waited for her friend.b. When Camilla was waiting, she spent the time in a profitable way.
    c. Camilla waited for her friend rather more than sixty minutes.d. It was good for Camilla to wait an hour for her friend.

23. This is your instruction and I have had no hand in it. From this sentence we know that the writer
    a. does not support the instruction
    b. is refusing to obey the instruction
    c. dislikes the person that issues the instruction
    d. is somehow happy with the instruction

For questions 24 and 25, choose the letter which contains the correct phonetic symbol in the underlined sounds below.

24. Plumb a. /m/ b. /b/ c. /ph/ d. /p/
25. Women a. /I/ b. /e/ c. /ou/ d. /u/

ANSWERS TO ENGLISH LANGUAGE 2011
1.A 2.B 3.B 4.C 5.C 6.D 7.D 8.B 9.B 10.B 11.B 12.A 13.C 14.A 15.C 16.D 17.B 18.D 19.C 20.A 21.D 22.B 23.A 24.A 25.A

OBAFEMI AWOLOWO UNIVERSITYILE-IFE, NIGERIA
2010 POST-UTME SCREENING EXERCISETHE USE OF ENGLISH
Choose the words that are closer in meaning to the words in initial positions.

1. Futile: (a) worthless (b) vain (c) dangerous (d) useless
2. Halt: (a) wait (b) fault (c) stop (d) stay
3. Virtuous: (a) seeing (b) good (c) upright (d) religious
4. renowned; (a) famous (b) popular (c) well read (d) familiar
5. Solitary: (a) private (b) sultry (c) alone (d) lonely

In each of questions 6 and 7, choose the option that best completes the gap(s)

6. The car owner does not think about the ____ of his vehicle and other payments involved in owning it. (a)

transportation (b) depreciation (c) calculation (d) appreciation

7. We shall offer a good job to a _____ to register guests in the Central Hotel.
(a) Waiter (b) watchman (c) cashier (d) receptionist

In each of the questions 8 and 9, choose the option opposite in meaning to the word in italics.

8. Lola was *agitated* when the sad news of her mother's accident was broken to her. (a) excited (b) calm (c) uncontrollable (d) unreasonable.

9. The president took exception to the *ignoble* role the young man played in the matter. (a) honourable (b) embarrassing (c) dishonourable (d) extraordinary

In each of questions 10 to 12, select the option that best explains the information conveyed in the sentence.

10. The crowd in the hall is *intimidating* (a) The crowd is frightening (b) The crowd is angry (c) The crowd is overwhelming (d) The crowd is riotous

11. The events of last Friday show that there is *no love lost* between the Principal and the Vice-Principal. (a) They like each other (b) They work independently (c) They cannot part company (d) They dislike each other.

12. Adawo is an *imp.* (a) Adawo behaves badly (b) Adawo behaves decently (c) Adawo behaves differently (d) Adawo behaves queerly

In questions 13 and 14, select from the options to fill in the gaps

13. There is no _____ sense in what that politician has just said. (a) many (b) plenty (c) lot of (d) much

14. The candidate made _____ at the village square a day before the elections (a) a sermon (b) an address (c) a eulogy (d) a lecture (e) a speech

In each of Questions 15 to 17, choose the option that best completes the gap(s)

15. The city_____ as a federal capital only _____the last twenty years. (a) existed/over (b) has existed/for (c) was existing/from (d) is existing/in

16. He is _____ Kaduna _____ an official assignment. (a) at/in (b) at/for (c) in/on (d) for/in

17. The members of the other team agree_____all the terms of the contract. (a) on (b) by (c) to (d) with

In each of Questions 18 and 19, choose the word(s) or phrases which best fill(s) the gap(s)

18. After Jerry had made the bed, he____ on it. (a) layed (b) laid (c) lied (d) lay

19. The buildings damaged by the rainstorm _____ schools, hospitals and private houses. (a) included (b) include (c) were included (d) was including

In each of Questions 20 and 21 fill the gap(s) with the most appropriate option.

20. _____ any problems, I shall travel to London tomorrow on a business trip. (a) In spite of (b) Given (c) Barring (d) In case

21. 'I can't stand people prying into my private life', Ladi said '_____' agreed Agbemu. (a) Me either (b) Me too (c) I also (d) Likewise myself

In each of Questions 22 to 25, choose the option that has the same consonant sound as the one represented by the letter(s) underlined.

22. <u>ch</u>eap: (a) ma<u>ch</u>ine (b) <u>sh</u>eep (c) <u>ch</u>ip (d) <u>ch</u>emist

23. S<u>ch</u>ool: (a) <u>c</u>ool (b) <u>ch</u>art (c) it<u>ch</u> (d) lee<u>ch</u>

24. <u>Ph</u>armacy: (a) e<u>v</u>ery (b) rou<u>gh</u> (c) plou<u>gh</u> (d) wa<u>v</u>e

25. <u>h</u>appy: (a) <u>h</u>our (b) eyes (c) <u>h</u>onour (d) be<u>h</u>ind

ANSWERS TO ENGLISH LANGUAGE 2010

1.A 2.C 3.C 4.A 5.C 6.B 7.D 8.B 9.C 10.A 11.D 12.A 13.D 14.B 15.B 16.C 17.C 18.D 19.B 20.C 21.B 22.C 23.A 24.B 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2009 POST-UME SCREENING EXERCISEUSE OF ENGLISH

Comprehension

Read the following passages carefully and answer the question that follows.

Passage 1

The best acceptable definition of history is that it is a record of the past actions of mankind, based on surviving evidence. It is this evidence that the historian employs to chronicle and correlate events, by which he arrives at conclusions which he believes to be valid. Hence, the historian is referred to as an interpreter of the development of mankind.

It should be understood that there is more than one way of treating the past. For example, in trying to deal with the revolutions in Nigeria, past and present, the historian may describe the events in a narrative order. Or, he may choose to concentrate on analysis of the general causes, comparing their stages of evolution with the patterns of revolution in other countries.

The historian does not seek to attain the same kind of results as the scientist, who can verify his conclusions by repeating his experiment under controlled conditions. Whilst he also attempts to classify the phenomena, the historian is more likely to consider events in terms of their uniqueness.

Added to this is the fact that history is concerned, fundamentally, with the lives and actions of men, and as such, the historian's search for causes is bound to be relatively subjective as compared to that by the scientist. In essence, however, historians are agreed and insist that history should be written as scientifically as possible and that the evidence should be analyzed with the same objective attitude employed by the scientist when he examines certain phenomena of nature.

1. History could be defined as (a) a record of the evolution of a country (b) a record of development of mankind (b) a record of the present actions of mankind based on surviving evidence (d) a record of the past action of mankind based on surviving evidence.

2. According to the passage, one of the duties of a historian is (a) to predict the future (b) to analyze the past and future (c) to explain the significance of past events (d) to interpret the development of mankind

3. How can history be scientifically recorded? (a) by examining available evidence and analyzing unusual occurrences (b) by falsifying and fabricating available facts (c) by speculating on what was and ought to have been (d) by concealing some of the evidence.

4. The scientist tends to be more reliable than a historian because (a) he works in a laboratory (b) he is better qualified (c) he can crosscheck his results several times (d) he has more time to work at his experiments.

5. According to the passage, a historian should try to examine a material (a) scientifically (b) subjectivity (c) accurately (d) objectively.

Passage 2

From the apex of the Niger Delta southwards, dry land, overgrown with dense forests still virginal in various spots, gives way to seasonally inundated zones. Here, sweet water swamps with strands of raffia palms gradually merge into tidal swamps of brackish ooze, where mud skippers thrive under the arching roots of mangroves. The Niger, fingering through a thousand creeks, meets the sea in a dozen estuaries. Strong River current drifts and mud across the rivers mouths, sealing them again and again to navigation.

6. According to the passage, how would you describe a seasonally inundated zone? (a) a zone always covered with mud (b) a zone always covered with shallow water

(c) a zone under water at certain times of the year (d) a zone subject to heavy rain every season.

7. What is brackish ooze? (a) a strong river current (b) a mixture of fresh water and mud (c) a mixture of fresh water and salt water (d) fresh and clear water

8. Where do mudskippers thrive? (a) in the creeks (b) in the swamps (c) in the mangroves (d) in the roots

9. Where does the Niger meet the sea? (a) in the creeks (b) in the Delta (c) in the swamps (d) in the forest

10. 'Fingering through' as used in the passage means (a) cutting across (b) passing through (c) cutting between (d) passing between

Lexis and Structure

In each of the following sentences, there is one word underlined and one gap. From the list of words lettered (a)-(e), choose the word that is most nearly opposite in meaning to the word underlined and which will appropriately fill the gap in the sentence. (11-15).

11. She was a very proficient hairdresser but had little aptitude for sewing in which she was… (a) new (b) unskilled (c) unlearned (d) ignorant (e) awkward

12. A metal will expand when it is heated and….. when it cools (a) shorten (b) lesser (c) contract (d) congeal (e) curtail

13. Athletes wishing to get rid of their… and get more energy should take more exercise (a) fat (b) oxygen (c) lethargy (d) trainers (e) espots

14. If you do not accept the offer of a job in the secretariat within the next one week, we shall assume you have… it. (a) denied (b) refused (c) deprived (d) left (e) lost

15. The political aspirant asked the villagers to support him and not to… his authority in anyway (a) deny (b) undermine (c) defy (d) despite (e) attack

From the list of words lettered a-e below each of the following sentences, choose the one which is nearest in meaning to the underlined word, as it is used in the sentence (Nos. 16-20).

16. After finishing the 800 metres race, he fell asleep from exhaustion (a) weakness (b) fatigue (c) overwork (d) eagerness (e) sloth

17. The footballers went back to their camp sullenly (a) cheekily (b) quickly (c) stubbornly (d) resentfully (e) silently

18. After Warri, on our way to Benin, we passed through a dense forest (a) crowded (b) close (c) thick (d) heavy (e) wooded

19. Last night there was a very fierce rain storm (a) raging (b) storming (c) angry (d) violent (e) ferocious

20. The examiners said that the candidate's performance in the examination was not good enough (a) failure (b) achievement (c) E-marks (d) presentation (e) marks

In each of the following question, fill each gap with the appropriate option from the list. Following exercises express different times by using different tenses. From the options suggested, choose any one that best suits each context

21. The editor was not happy that the Nigeria press was hemmed… (a) up (b) across (c) in (d) over (e) sideway

22. More… to your elbow as you campaign for press freedom! (a) energy (b) power (c) effort (d) grease (e) kinetic

23. A child that shows mature characteristics at an early age may be descried as… (a) precocious (b) ingenious (c) premature (d) preconceived

24. That is a very terrible woman; everyday she makes a lot of noise about one thing or the other. I'm not surprised, that's what her sisters… too (a) are used to doing (b) do (c) always used to do (d) are doing

25. Sir, I'm not lying about the matter, I know nothing of it. If I knew, (a) I must tell you (b) I can tell you (c) I would tell you (d) I shall tell you.

ANSWERS TO ENGLISH LANGUAGE 2009

1.D 2.D 3.A 4.C 5.D 6.B 7.C 8.C 9.A 10.A 11.B 12.C 13A 14E 15.D 16.B 17.E 18.C 19.D 20.E 21.C 22.B 23.A 24.B 25.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2008 POST-UME SCREENING EXERCISE
ENGLISH LANGUAGE

Read the following passage and answer the questions based on it

Why should an artist attempt to concentrate his experience of life in a unique work of art? No final answer can be given, but two possible reasons suggest themselves. Man seems always to have preferred order to disorder. His whole progress on earth has been a struggle to this end. Everything he has done, from the creation of vast empires to the growing of small gardens, has been a triumph, in greater or lesser degree, of order over chaos. To help control his own thought, the sudden surprises of his limitless mind, he has had to invent Language. As each new thing appears, whether it be an idea or an object, he gives it a name and thus brings it into line with the things he already understands. And he has invented for himself more than one kind of language. There is a language of painting, a language of architecture, or mathematics- to name but three each has its own special symbols, its own form of logic; and each enables him to express some of the myriad thoughts that crowd his mind. high among the languages of man is the language of music.

1. Through his struggles man has achieved (a) the return of a state of utter confusion (b) the complete destruction of vast empires (c) the growth of disorder from order (d) the transformation of order out of chaos

2. Man invent the Language because (a) it helped to organize his thoughts and unceasing ideas (b) there was little he could do at the time to diversify his talents (c) he already had control over his mind and its countless ideas (d) it was a method or realizing his position as a Supreme Being.

3. By naming objects or ideas, man was able to (a) comprehend less and less the things around and about him (b) clarify things and correlate them wit facts already known (c) allow an area of complete confusion to develop in language (d) make visual impressions for more important than ever before.

4. The various language can be identified by (a) their use of the same marks or signs and system of logic (b) the manner in which their logic agrees and their symbolism is similar. (c) the endings of the various symbols and their simplified logic (d) their own science of reasoning and their peculiar marks or signs

5. The work "myriad" (line 11) as used in the context means (a) terrible (b) mysterious (c)frequent (d) multitude

In each of question 6-10, there is a gap. Complete the gaps with appropriate item from the options A-D under sentence.

6. If you try to write without having a clear idea, you often end up just _____ without saying anything very meaningful. (a) drooling (b) boasting (c) gambling (d) rambling

7. The four of you should share the remainder _____ you.(a) among (b) around (c) between (d) within

8. I have no doubt that Enyimba will _____Oaks next Saturday. (a) flog (b) whip (c) win (d) beat

9. "You need not go _____ down the road before you notice a huge white building on the road", the man said. (a) inside (b) farther (c) further (d) deep

10. If your writing lacks coherence, your reader will just find something else to read or _____ the television. (a) tune in (b) turn on (c) switch up (d) open.

Choose the appropriate option to complete the following:

11. The President promised a higher allocation to the education sector in this year's budget, _____ (a) isn't he? (b) did he? (c) didn't he? (d) doesn't he?

12. This picture is **ascribed**to Leonardo da Vinci. This means that _____ (a) Leonardo da Vinci painted it (b) Leonardo da Vinci might have painted it (c) Leonardo da Vinci definitely painted it (d) Leonardo da Vinci did part of the painting.

13. The Principal's reference to the cane _____ the boy with much mental uneasiness. (a) inflicted (b) assaulted (c) afflicted (d) insulted

14. The government's envoy had left the country again in his latest round of **trouble shooting**. The underlined expression means (a) trip marring efforts (b) troublesome efforts. (c) peacemaking efforts (d) trouble making efforts

15. His three sons, Sanmi, Chukwu and Collins are eleven, nine and seven _____ (a) respectively (b) respectedly (c) succeedingly (d) successively.

16. As the examination progressed, it was observed that more and more candidates stared into space. this means many candidates (a) looked into the sky (b) looked straight for long but to nothing in particular (c) looked through the window for would-be helpers (d) tried to ensure that the spaces, between them were well maintained.

17. Hundreds of car went _ us before we were given a ride to the campus. (a) pasted (b) past (c) passed (d) by

18. You told me that Johnson is your trusted friend, why did you not **stand up for** him during his trial? (a) defend (b) ridicule (c) pity (d) disown.

19. When you pronounce the word **university**, how many sounds could you perceive? (a) 5 (b) 4 (c)10 (d)

ANSWERS TO ENGLISH LANGUAGE 2008
1.D 2.A 3.A 4.C 5.D 6.D 7.A 8.C 9.B 10.B 11.C 12.A
13.A 14.C 15.A 16.B 17.C 18.A 19.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2007 POST-UME SCREENING EXERCISEENGLISH LANGUAGE

Fill in the blanks in the following sentences making use of one of the four options in the letters A-D

1. They _____ arrived Lagos by now, all things being equal (a) had (b) must (c) might have (d) would have

2. The pupils _____ so much noise that the teacher had to tell them to stand up and raise up their hands (a) had been making (b) should have made (c) were making (d) had made

3. I _____that he was insincere all along (a) could know (b) must know (c) should have known (d) may have known

4. If I had gone to Lokoja, I _____the opportunity of seeing the President (a) should not have had (b) must not have had (c) would not have had (d) should not have

Choose the preposition that best fills the gaps in the following sentences

5. My sister does not have flair _____Mathematics (a) at (b) at (c) with (d) for

6. When I got to her house, she was still _____ bed (a) in (b) on (b) on the (d) in the

7. During the demonstration, the anti-riot policemen were instructed to break _____ the students' defence line (a) off (b) open (c) through (d) down

8. I was _____ hearing distance of the speaker (a) at (b) in (c) on (d) within

From the words labeled A-D in numbers 9 to 20, choose the one that best completes each of the following sentences

9. The electricity cable had to be _____ enough to be laid along the bend in the road (a) elastic (b) taut (c) compliment (d) flexible

10. We didn't have a lot of money, so I had to live quite _____(a) niggardly (b) frugally (c) wastefully (d) grudgingly

11. I acted too impetuously, I do not know what _____ me (a) came along (b) came over (c) came at (d) came on

12. The hurricane raged for several days, learning a trial of _____ across the land (a) destruction (b) depoilation (c) desperation (d) demolition

13. If a player breaks the rules during a match, one point will be _____ to his opponent (a) adjourned (b) credited (c) debited (d) allied

14. Mouse-traps are not always very effective, as some mice prove to be remarkably _____ (a) inaccessible (b) perpetual (c) inconspicuous (d) elusive

15. At the frontier he hid the watches in his pocket in order to __customs duty (a) evade (b) incur (c) repel (d) deceive

16. The driver was short of petrol, so he _____ down all the hills with the engine switched off (a) glided (b) cut (c) wheeled (d) coasted

17. Everyone in my family has a job. My mother is s teacher; my father is an engineer, and my granny _____ (a) used to sell roast chicken (b) is selling roast chicken (c) has roast chicken (d) sells roast chicken

18. One curious thing about my uncle is that he wishes _____ (a) he is having eight wives (b) he had eight wives (c) he can have eight wives (d) he can be allowed to have eight wives

19. I'm afraid, you know. My father has been sleeping since 4:00p.m yesterday. It's about time _____ (a) to wake up (b) he wakes (c) he woke (d) he's awake

20. Are you deaf? I asked you _____ (a) how old you were (b) how old are you (c) how old is your age (d) what is your age

21. What is a sentence? (a) it is a made up of words (b) it is made up of phrases and clauses (c) it is a group of words giving a complete sense (d) it can be simple or complex

22. What is a clause? (a) it is made up of words (b) it is made up of sentences (c) it is made up of phrases (d) it is a group of words containing a finite verb
23. What is a phrase? (a) it is a group of words containing a finite verb (b) it is a group of words giving a complete sense (c) it is a group of words not containing a finite verb (d) it usually begins with a preposition or a participle
24. An example of a finite verb is (a) going to school every day (b) given his position as the principal (c) while going to school (d) while they were going to school
25. What is tense? (a) it has to do with present, past and future times (b0 it is a correspondence between the form of the verb and the concept of time (d) it is a derived from the Latin word "transpire" (e) it is a controversial topic in linguistics
26. What is aspect? (a) it is the manner in which the verbal action is experienced or regarded (b) it reflects the attitude or mood of the speaker (c) it is made up of progressive and perfective forms (d) it is normally joined together with tense
27. What are "minor sentences"? (a) they are complete sentences (b) they are incomplete statements (c) they are incomplete statements but normally function as sentences (d) they are used by writers for economical purposes
28. In measuring one's linguistics competence in a particular language, itemize four sentence types that one needs to master (a) simple, complex-multiple, difficult and more difficult (b) simple, complex, compound and compound-complex (c) simple, more simple, difficult, more difficult (d) rational, more rational, logical and more logical.

ANSWERS TO ENGLISH LANGUAGE 2007
1.D 2.C 3.C 4.C 5.D 6.A 7.C 8.A 9.B 10.B 11.B 12.A 13.B 14.D 15.A 16.A 17.D 18.C 19.C 20.A 21.C 22.D 23.C 24.A 25.B 26.B 27.C 28.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2006 POST-UME SCREENING EXERCISE ENGLISH LANGUAGE

From the words lettered A-E, choose the word that is alike in meaning to the word underlined.

1. Andrew made some underlined bellicose statement about his strength to other boys in the street. This means that Andrew (a) is a brave man (b) wishes to fight (c) is a coward (d) loves to help others with his power (e) has a lot of power
2. The excuse that he forgot about the meeting was a flimsy one. This means the excuse was (a) very bad (c) a complete lie (c) difficult to believe (d) not important (d) a very good one.
3. Scrupulous politicians do not have a place in the Nigerian politics. Scrupulous politicians are (a) honest (b) dishonest (c) corrupt (d) good-natured (e) insincere
4. The woman was happy because her gorgeous dressing made her quite obtrusive. The woman was very (a) appreciated (b) proud (c) good (d) noticeable (d) excellent
5. The man is known to be a sly. I won't trust him with anything. This means the man is known as a (a) deceiver (b) thief (c) kidnapper (d) rogue (e) burglar

From the alternatives suggested, select the answer that best expresses the same meaning as the expression italicized in each exercise.

6. Don't take the plate away; *it is possible for the owner to ask for it*. (a) the owner might (b) the owner can (c) the owner is going to (d) the owner will come to (e) none of them
7. I wonder *if you would allow me* to put out the fire (a) I might (b) I can (c) I should (d) I have to (e) all of them
8. When your great-grandmother was in Vietnam, *did she have the ability to speak Chinese?* (a) had she been able (b) was she enabled (c) could she (d) how possible was it for her (c) none of them.
9. I know a carpenter that *knows how to* make that kind of wardrobe (a) could (b) has the-know-how (c) can (d) can be able (e) may be able to
10. Frances, where is your male visitor? Don't lie to me, *it is not possible that he has gone through the high window* (a) he couldn't have (b) he can't have (c) he shouldn't (d) he mustn't have (e) none of them
11. My father *made no bones about* telling his friend how he felt about his behavior. This means that my father (a) spoke well to his friend about his behavior (b) spoke honestly to this friend about his behavior (c) spoke in the open to his friend about his behavior (d) spoke hesitantly to his friend about his behavior (e) spoke with all his might to his friend about his behavior.
12. After much talk, my brother thought it was time to *hit the hay*. This means that my brother thought it was time to (a) make hay while the sun shines (b) burn the collection of hay (c) go to bed (d) keep quiet (e) tell the others off
13. The housemaster was *foaming in the mouth* when he discovered that some students had sneaked out of the hostel. This means the house master (a) was very sad (b) had epilepsy (c) became silent and calculative (d) was uncontrollably furious (e) was jittery
14. Who told Mabel she could sing? She really *laid an egg* at the talent show. This means (a) Mabel's performance was very embarrassing (b) Mabel's performance was very interesting (c) Mabel's performance was very impressive (d) Mabel's performance was not very bad (e) Mabel's performance was like that of a hen laying an egg.
15. Mr. Johnson is *on the warpath because* his car broke down again. This means Mr. Johnson is (a) ready to fight his mechanic (b) started fighting the government because the road was bad (c) very infuriated (d) fighting a war with his family in the car (e) drawing a battle in between him and his mechanic

For questions 16-20, choose among the options A-E the word that is nearest in meaning to the italicized words in each of the sentences.

16. The President announced that all political prisoners have been *pardoned*. (a) condemned (b) severely rebuked (c) banished (d) reprieved (e) released
17. He resented being criticized every time by his boss (a) preferred (b) abhorred (c) ignored (d) carefully considered (e) enjoyed
18. The most striking thing about the just-concluded World-Cup Finals in Germany was the complete *eclipse* of the defending champion-Brazil (a) sudden disappearance (b) defeat (c) failure (d) brilliant performance (e) arrogance
19. As he watched the winning film his face remained inscrutable (a) unreadable (b) pale (c) unfriendly (d) impossible to please (e) bright

20. His latest album has done much to *boost* his reputation as a writer (a) increase (b) establish (c) nourish (d) destroy (e) decrease

For question 21-25, choose from the option A-E the word or phrase opposite in meaning to the underlined word.

21. The doctor certified the tumour <u>malignant</u> (a) benign (b) ripe (c) painless (d) dangerous (e) slow

22. Andrew is too <u>garrulous</u> for my liking (a) dull (b) apathetic (c) laconic (d) easygoing (e) dumb

23. The man holds <u>parochial</u> views on almost every issues (a) rational (b) realistic (c) popular (d) broad-minded (e) sensible

24. Your idea on this issue seems to me quite <u>novel</u> (a) bookish (b) dangerous (c) archaic (d) genuine (e) good

25. The people appreciated the chairman for his <u>invaluable</u> contributions to the community's development (a) worthless (b) costly (c) unrecognized (d) incalculable (e) meaningless

26. Which of the following statements is true with regard to summary writing? (a) details are more important than main ideas (b) main ideas are more important than examples (c) illustrations are more important than main ideas (d) elaborations, exemplifications and details are more important than main idea (e) none of the above

Choose the appropriate option to complete the following:

27. At the crusade, we prayed to God to _____ this on us (a) breath His breathe (b) breathe His breath (c) breathe His breathe (d) breath His breath

28. The chairman, Committee of Deans needs to see your friend Dele urgently, do you know his _____? (a) where and about (b) whereabouts (c) whereabout (d) where and abouts

29. "As from now, this university will have zero tolerance for any form of malpractice", so the Vice-Chancellor. The Vice-Chancellor said that (a) as from then, that university would have zero tolerance for any form of malpractice (b) as from now, this university would have zero tolerance for any form of malpractice (c) as from the, his university will have zero tolerance for any form of malpractice (d) as from then, that university would begin to have zero tolerance for any form of malpractice.

30. The teacher took me for one of those students who could not spell such words as
(a) 'miscellaneous and maintenance'
(b) 'miscellaneous and maintenance'
(c) 'miscellaneous and maintenance'
(d) 'miscellaneous and maintenance'

31. God should take control of the heart of the organizers of this Post-UME screening exercise, they should not make this test _____than UME (a) more tough (b) more tougher (c) much tougher (d) more much tougher.

ANSWERS TO ENGLISH LANGUAGE 2006

1.B 2.C 3.D 4.B 5.A 6.A 7.C 8.C 9.D 10.A 11.B 12.C 13.D 14.C 15.C 16.D 17.B 18.D 19.A 20.A 21.A 22.E 23.D 24.C 25.A 26.B 27.B 28.B 29.A 30.C 31.C

1. The probability of an event A given by P(A) is a number between   (a) -1 and 1 (b) 0 and ½ (c) 0 and 1   (d) -1 and 0.

2. Noting that, $\sin^2\theta + \cos^2\theta = 1$, simplify $\frac{1-\cos\theta}{\sin^2\theta}$
(a) $\frac{1}{1+\cos\theta}$ (b) $\frac{1}{1-\cos\theta}$ (c) $\frac{1}{1+\sin\theta}$ (d) $\frac{1}{1-\sin\theta}$

3. A circle has an eccentricity   (a) < 1 (b) 1 (c) > 1 (d) 0.

4. It two elements A and B are independent then *P(A and B)* is   (a) $P(A \cap B)$ (b) $(A \cup B)$ (c) P(A) (d) P(B).

5. Simplify $\frac{3^{n+3} - 3^{n+2}}{3^{n+1} - 3^n}$ (a) -9   (b) 9 (c) 10   (d) -10.

6. Noting that $\cos\alpha = (90-\alpha)$, find y in terms of x in the equation $\cos\left(1 + \frac{1}{2}x\right) = \sin\left(\frac{3}{2}y\right)$ (a) y = $\frac{178+x}{3}$ (b) y = $\frac{x-178}{3}$ (c) $\frac{178-x}{3}$ (d) $\frac{-(178+x)}{3}$.

7. For what values of x is $x^{-1} < -1$?   (a) 0 < x < 1 (b) x < -1, x > 0   (c) x > 1, x < 0   (d) -1 < x < 0.

8. In how many ways can the letters of the word NWAFOR be permuted?   (a) 7200 (b) 72   (c) 720 (d) 72000.

9. If α, β are the roots of equation $18 + 15x - 3x2 = 0$, find $\alpha\beta - \alpha - \beta$ (a) 11 (b) -11   (c) 10 (d) -10.

10. Resolve $\frac{1}{(1-x^2)}$ into partial fractions   (a) $\frac{1}{2(1+x)} - \frac{1}{2(1-x)}$ (b) $\frac{1}{2(1+x)} + \frac{1}{2(x-1)}$ (c) $\frac{1}{2(x+1)} + \frac{1}{2(1-x)}$ (d) $\frac{1}{2(1-x^2)}$

11. Given that the sum of infinity $S_\infty = a + ar + ar^2 + ... = \frac{a}{1-r}$, to what sum does the infinite series $1 - \frac{2}{3} + \frac{4}{9} - \frac{8}{27} + \cdots$ coverage   (a) $-\frac{3}{5}$ (b) $\frac{5}{3}$ (c) $-\frac{5}{3}$ (d) $\frac{3}{5}$

12. What is the value of x for which $x2 - 5x + 6$ is minimum?   (a) $\frac{5}{2}$ (b) $-\frac{5}{2}$ (c) 3   (d) -3.

13. Integrate $5x4 + e^{-x}$ with respect to x   (a) $-e^{-x} + 5^x + k$ (b) $e^{-x} + x^5 + K$ (c) $-e^{-x} - x^{-5} + K$ (d) $-e^{-x} + x^4 + K$.

14. If $X = \{2, 3, 6, 7, 8\}$ and $Y = \{6, 7, 10, 3, 17\}$, find $Y - \{X \cap Y\}$.   (a) { }   (b) {10, 17}   (c) {2, 3, 6, 7, 8, 10, 17} (d) {3, 6, 7}.

15. Find the angle in the line $\frac{1}{\sqrt{3}}y - x = 0$ makes with positive y-axis   (a) 30° (b) 60° (c) 0° (d) 45°.

16. Find the value of p which satisfies the equation $\sqrt{P} - \frac{6}{p} = 1$ (a) 4 (b) -4 (c) 9   (d) -9.

17. Find the area of circle $4x^2 + 4y^2 - 400 = 0$ (a) $10\pi \, sq.units$ (b) $40\pi \, sq.units$ (c) $400\pi \, sq.units$ (d) $100\pi \, sq.units$.

18. Let the mean of x, y^{-1}, z^5 be 6 find the mean of 10, y^{-1}, 12, x z5.   (a) 7 (b) 8 (c) 9 (d) 10.

19. What is the addition of y and x- intercepts of the line $\frac{2}{3} + \frac{3}{2}y + 9 = 0$?   (a) -19.5 (b) 19.5 (c) 20.5 (d) -20.5

20. Given that $h(x) = 3 + 2x$ and $f(x) = 1 - x$, find h(– f (x)). (a) 1 – 2x (b) 1 + 2x (c) 2x – 1   (d) -1 – 2x.

21. Find the value of k in the equation $\frac{5}{5\sqrt{2}} - \sqrt{8} = k\sqrt{2}$ (a) 4/3 (b) ¾ (c) -3/4 (d) -4/3.

22. Evaluate $\int_0^1 3^x \log 3 dx$ (a) 3   (b) 4   (c) 1   (d) 2.

ANSWERS TO 2015 POST-UTME SCREENING EXERCISE

1. **C**

2. $\frac{1-\cos\theta}{\sin^2\theta}$
Recall that: $\sin^2\theta + \cos^2\theta = 1$
$\sin^2\theta = 1 - \cos^2\theta$
$\frac{1-\cos\theta}{1-\cos^2\theta}$
But $1 - \cos^2\theta = (1 - \cos\theta)(1 + \cos\theta)$
$\Rightarrow 1 \frac{1-\cos\theta}{1-\cos^2\theta}$
$= \frac{1-\cos\theta}{(1-\cos\theta)(1+\cos\theta)}$
$= \frac{1}{1+\cos\theta}$**Ans:A**

3. **D**

4. **A**

5. $\frac{3^{n+3} - 3^{n+2}}{3^{n+1} - 3^n}$ $= \frac{3^n X 3^3 - 3^n X 3^2}{3^n X 3^1 - 3^n}$ $= \frac{3^{n+3} - 3^{n+2}}{3^n (3-1)}$
$= \frac{3^n X 3^2 X 2}{3^n X 2}$ $= 3^2 = 9$**Ans:B**

6. $\cos\left(1 + \frac{1}{2}x\right) = \sin\left(\frac{3}{2}y\right)$
But $\cos\alpha = \sin(90 - \alpha)$
$= \cos\left(1 + \frac{1}{2}x\right) = \sin\left[90 - \left(1 + \frac{1}{2}x\right)\right]$
$\cos\left(1 + \frac{1}{2}x\right) = \sin\left(\frac{3}{2}y\right)$
$= \sin\left[90 - \left(1 + \frac{1}{2}x\right)\right] = \sin\left(\frac{3}{2}y\right)$
$= 90 - \left(1 + \frac{1}{2}x\right) = \frac{3}{2}y$
$= 90 - \left(\frac{2+x}{2}x\right) = \frac{3}{2}y$
Multiply through by 2
$180 - (2 + x) = 3y$
$180 - 2 - x = 3y$
$178 - x = 3y$
$y = 1/3 (178 - x)$
$y = \frac{178-x}{3}$ **Ans: C**

7. $x^{-1} =< -1$
$\frac{1}{x} < -1$
Multiply through by x^2
$\frac{1}{x} X zx^2 < -1 X x^2$
$x < -x^2$
$x + x^2 < 0$
$x(1 + x) < 0$
$x = 0 \ or \ 1 + x = 0$
$x = 0 \ or \ -1$

Factor

	$x < -1$	$-1 < x < 0$	$x > 0$
x	-ve	-ve	+ve
1 + x	-ve	+ve	+ve
x(1 + x)	+ve	-ve	+ve

Since $x(1 + x) <$
0 $(i.e. negative)$ $the\ solution\ of\ the\ inequality\ is - 1 <$
$x < 0$ **Ans: D**

8. The word NWAFOR has six (6) distinct letters.
$\Longrightarrow n = 6$
The number of ways of arranging n distinct object is n!
No of ways = $n! = 6! = 720$ **Ans: C**

9. $18 + 15x - 3x^2 = 0$
a = -3, b = 15, c = 18
$\alpha + \beta = \frac{-b}{a} = \frac{-15}{-3} = 5$
$\alpha\beta = \frac{c}{a} = \frac{18}{-3} = -6$
$\alpha\beta - \alpha - \beta = \alpha\beta - (\alpha + \beta)$
$= -6 - (5)$ $= -11$ **Ans:B**

10. $\frac{1}{1-x^2}$
$But\ 1 - x^2 = (1 - x)(1 + x)$
$\frac{1}{1-x^2} = \frac{1}{(1-x)(1+x)}$.
A linear factor of the form ax + b always gives a partial fraction of $\frac{A}{ax\_b}$
$\frac{1}{(1-x)(1+x)} = \frac{A}{1-x} + \frac{B}{1+x}$
$\frac{1}{(1-x)(1+x)}$
$= \frac{A(1+x)+B(1-x)}{(1-x)(1+x)}$
$1 = A(1 + x) + B(1 - x)$
Let x = 1
$1 = A(1 + 1) + B(1 - 1)$
$1 = 2A + B(0)$
$1 = 2A$
A = ½
$Let\ x = -1$
$1 = A(-1 + 1) + B[1 - (-1)]$
$1 = A(0) + B(1 + 1)$
B = ½
$\frac{1}{(1-x)(1+x)} = \frac{A}{1-x} + \frac{B}{1+x}$
$= \frac{\frac{1}{2}}{1-x} + \frac{\frac{1}{2}}{1+x}$
$\frac{1}{2(1-x)} + \frac{1}{2(1+x)}$
$= \frac{1}{(1-x)(1+x)} = \frac{1}{1-x^2} = \frac{1}{2(1-x)} + \frac{1}{2(1+x)}$ **Ans: C**

11. $1 - \frac{2}{3} + \frac{4}{9} - \frac{8}{27} + \cdots$
$T_1 = 1, T_2 = -\frac{2}{3}, T_3 = \frac{4}{9}$
For a given series to be an A.P
$T_2 - T_1 = T_3 - T_2$
For a given series to be a G.P
$\frac{T_2}{T_1} = \frac{T_3}{2}$
The series is a G.P
$r = \frac{T_2}{T_1} = \frac{-\frac{2}{3}}{1}$

$r = -\frac{2}{3}$
$S_\infty = \frac{a}{1-r}$
a = T1 = 1
$S_\infty = \frac{1}{1-(-\frac{2}{3})} = \frac{1}{1+\frac{2}{3}}$
$= \frac{1}{\frac{3+2}{3}} = \frac{1}{\frac{5}{3}} = \frac{3}{5}$ **Ans: D**

12. $Let\ y = x^2 - 5x + 6$
Minimum and maximum are turning point. At turning $\frac{dy}{dx} = 0$
$\frac{dy}{dx} = 2x - 5 = 0$
$2x - 5 = 0$
$x = \frac{5}{2}$ **Ans: A**

13. $\int(5x^4 + e^{-x})dx$
$= \frac{5x^{4+1}}{4+1} + (-e^{-x}) + c$
$\frac{5x^5}{5} - e^{-x} + c$
$= x^5 - e^x + c$
$\int(5x^4 + e^x + x^5 + c$ **Ans**: **A**

14. X = {2, 3, 6, 7, 8} Y = {6, 7, 10, 3, 17}
The intersect of two sets X and Y is a set that contain elements that are common to both sets.
$X \cap Y = \{3,6,7\}$
The difference of two sets A and B (i.e. A − B) is a set, which contain only elements that are formed in set A but not in set B.
$Y - (X \cap Y)$ = {6, 7, 10, 3, 17} − {3, 6, 7} = {10, 17}
$Y - (X \cap Y) = \{10, 17\}$ **Ans: B**

15. $\frac{1}{\sqrt{3}}y - x = 0$
$\frac{y}{\sqrt{3}} - x = 0$
Multiply through with $\sqrt{3}$
$y - x\sqrt{3} = 0$
$y = x\sqrt{3}$
Divide through by x
$\frac{y}{x} = \frac{\sqrt{3}}{1}$
but $\tan\theta = \frac{y}{x} = \frac{\sqrt{3}}{1}$
$\theta = \tan^{-1}(\sqrt{3})$ $= 60^o$
The angle 60° is the angle the line makes with the positive x-axis
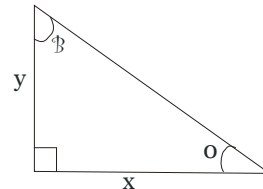
$\Theta + \beta = 90$
$60 + \beta = 90$
$\beta = 90 - 60$
$\beta = 30^o$
Note that the angle the line $\frac{1}{\sqrt{3}}y - x = 0$ makes with the positive y-axis is given by $\tan\beta = \frac{x}{y}$ **Ans: A**

16. $\sqrt{P} - \frac{6}{\sqrt{p}} = 1$
Multiply through by $\sqrt{P}$

$P - 6 = \sqrt{P}$

Square both side $(P - 6)^2 = (\sqrt{P})^2$

$P^2 - 12P + 36 = P$

$P^2 - 12P - P + 36 = 0$

$P = 9$ or 4

Check to see if 9 or 4 satisfied the equation

$\sqrt{P} - \frac{6}{\sqrt{P}} = 1$

When $P = 9$

$\sqrt{9} - \frac{6}{\sqrt{P}} = 1$

$3 - \frac{6}{3} = 1$

$3 - 2 = 1$

$1 = 1$

Hence the value p = 9 satisfied the equation when p = 4

$\sqrt{4} - \frac{6}{\sqrt{4}} = 1$

$2 - \frac{6}{2} = 1$

$2 - 3 = 1$

$-1 \neq 1$

Hence the value p = 4 does not satisfy the equation $\therefore p = 9$ **Ans: C**

17. $4x^2 + 4y^2 - 400 = 0$

Divide through by 4

$x^2 + y^2 - 100 = 0$

$x^2 + y^2 = 100$

$x^2 + y^2 + 10^2$...............(i)

The general equation of a circle is given by $x^2 + y^2 = r^2$ ....(ii)

From equation i and ii

$r^2 = 10^2$

r = 10

Area of a circle $(A) = \pi r^2$

$A = \pi(10)^2$

$A = 100\pi$ **Ans:D**

18. $\bar{x} = \frac{\sum x}{n}$

For the numbers: x, y^{-1} & z^5

$\bar{x} = \frac{x + y^{-1} + z^5}{3} = 6$

$x + y^{-1} + z^5 = 3 \times 6 = 18$

$x + y-1 + z^5 = 18$........................(i)

$\bar{x} = \frac{\sum x}{n}$

For the numbers: $10, y^{-1}, 12, x, z^5$

$\bar{x} = \frac{10 + y^{-1} + 12 + x + y^5}{5}$

$\bar{x} = \frac{10 + 12 + x + y^{-1} + y^5}{5}$

But $x + y^{-1} + z^5 = 18$

$\bar{x} = \frac{10 + 12 + 18}{5}$

$\bar{x} = \frac{40}{5} = 8$ **Ans: B**

19. $\frac{2}{3} + \frac{3}{2}y + 9 = 0$?

$\frac{2x}{3} + \frac{3y}{2} = -9$

$\frac{4x + 9y}{6} = -9$

$4x + 9x = -9 \times 6$

Divide through by 36

$\frac{4x}{36} + \frac{9y}{36} = \frac{-9 \times 6}{36}$

$\frac{x}{9} + \frac{y}{4} = \frac{-3}{2}$

Multiply through by $\frac{2}{3}$

$\frac{2}{3}x \frac{x}{9} + \frac{2}{3}x \frac{y}{4} = \frac{-3}{2}x \frac{2}{3}$

$\frac{2x}{27} + \frac{y}{6} = -1$

Multiply through by -1

$-\frac{2x}{27} + \frac{y}{6} = -1$

The above equation can be written as shown below

$-\frac{x}{\frac{27}{6}} - \frac{y}{6} = 1 \ldots \ldots \ldots \ldots (i)$

The double intercept form of the equation of a straight line is

$\frac{x}{a} + \frac{y}{b} = 1 \ldots \ldots \ldots \ldots \ldots (ii)$

$a = -\frac{27}{2}, b = -6$

$a + b = -\frac{27}{2} - \frac{6}{1}$

$= \frac{-27 - 12}{2}$

$= \frac{-39}{2} = -19.5$ **Ans: A**

20. $h(x) = 3 + 2x$

$f(x) = 1 - x = -(x - 1)$

$-f(x) = -[(x - 1)]$

$= x - 1$

$h[-f(x)] = h(x - 1)$

$= 3 + 2(x - 1)$

$= 3 + 2x - 2$

$h[-f(x)] = 2x + 1$ **Ans: B**

21. $\frac{5}{5\sqrt{2}} - \sqrt{8} = k\sqrt{2}$

$= \frac{5}{5\sqrt{2}} - 2\sqrt{2} = k\sqrt{2}$

Multiply through by $2\sqrt{2}$

$5 - 2\sqrt{2}(2\sqrt{2}) = 2\sqrt{2}(k\sqrt{2})$

$5 - 4(2) = 2k(2)$

$5 - 8 = 4k$

$-3 = 4k$

$k = -3/4$ **Ans: C**

22. $\int_0^1 3^x log3 dx$

$\int_0^1 3^x log3 dx$

$\int_0^1 3^x log\ 3_e\ dx$

$= \int_0^1 3^x\ In\ 3\ dx$

$= \int^0 a^x In\ a\ dx = a^x$

$\int_0^1 3^x In\ 3\ dx = [3^x]_0^1$

$= 3^1 - 3^0$

$= 3 - 1 = 2$ **Ans: D**

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA
2014 POST-UTME SCREENING EXERCISE MATHEMATICS

1. Evaluate $\left(\frac{1}{25}\right)^{-\frac{1}{2}} + \left(\frac{1}{8}\right)^{-\frac{2}{3}}$ A.8 B.10 C.9 D.6

2. Find the remainder when $x^4 - 11x + 2$ is divided by x A.2 B.6 C.-2 D.5

3. If $\cos A = \frac{12}{13}$ and A is an acute angle, find $(1 + \tan^2 A)$. A.$\frac{144}{25}$ B.$\frac{25}{144}$ C.$\frac{169}{25}$ D.$\frac{169}{144}$

4. Integrate the function $1 - 2x$. A. $x - x^2 + K$ B. $x + x^{-2} + K$ C. $-x - x^{-2} + K$ D. $x - x^{-2} + K$

5. If α and β are the roots of equation $cx^2 - ax + b = 0$, find $\alpha\beta$ A. $-\frac{b}{a}$ B. $-\frac{a}{c}$ C. $\frac{b}{c}$ D. $\frac{c}{a}$

6. The binary operation $\otimes$ is divided by a $\otimes$ b is defined by a $\otimes$ b = 2a -1. Find 3 $\otimes$ (2$\otimes$1)
   A.3 B.4 C.5 D.6

7. Two coins are tossed; find the probability of having at least two heads A. $\frac{1}{2}$ B. $\frac{3}{4}$ C. $\frac{1}{4}$ D.1

8. If x is a real number and $x + 11 < 0$, evaluate $\frac{|x|}{x}$
   A.0 B.-1 C.1 D.2

9. If P is directly proportional to $\sqrt{Q}$; P = 20 when Q = 4. Find Q when P = 100
   A.200 B.300 C.100 D.400

10. Find the angel in degree which the line $x - \sqrt{3}y = 0$ makes with the positive y – axis
    A.30° B.90° C.60° D.180°

11. If equation $6 - kx + 2x^2 = 0$ has equal roots, find $k^2 + 4$. A.48 B.52 C.44 D.96

12. Simplify $\log_{100}\sqrt{10}^{-1}$. A. $-\frac{1}{8}$ B. $-\frac{1}{4}$ C. $\frac{1}{4}$ D. $\frac{1}{8}$

13. Obtain the centre of the circle $7(y^2 + 10y) + 7x^2 = 1$ A.(0,5) B.(-5,0) C.(0,-5) D.(5,0)

14. Given $\int_{-a}^{a} 15x^2\ dx = 3430$, find the value of the constant a A.8 B.6 C.7 D.9

15. Evaluate $\frac{d}{dx}$ (In Sin $3x$) A.3 cos 3x B.3tan 3x C. $\frac{1}{\sin 3x}$ D. 3 sin 3x

16. Find the equation of a line which passes through a point (-2,3) and makes an angle of 45° with positive x-axis A. $y - x - 5 = 0$ B. $y + x = 0$ C. $x - y - 5 = 0$ D. $y - x + 5 = 0$

17. Find the sum of infinity of the sequence 1,-1,1,-1,1,-1 .... A.2 B. $-\frac{1}{2}$ C.1 D. $\frac{1}{2}$

18. Differentiate $2 - \sin(2 - ax)$ with respect to x
    A.a cos (2 – ax) B. $-a \sin(2 - ax)$ C. $-a\cos(2 - ax)$ D. $-a\sin(2 - ax)$

19. Simplify $\left(\frac{8\sqrt{n}^2}{m^{3/2}}\right)\left(\frac{4^{-1}m^2}{2n^{-2}}\right)$ A. $128n^3m^{-1}$ B. $8n^3m^{-1}$ C. $8n^3m$ D. $8n^4m$

20. Solve the equation

21. Simplify: $\frac{30}{\sqrt{2}} + \sqrt{50}$ A. $4\sqrt{5}$ B. $20\sqrt{2}$ C. $5\sqrt{5}$ D. $10\sqrt{2}$

22. If m is the gradient of the line $pq - px - qy = 0$ and $q \neq 0$, find $\frac{1}{m}$
    A. $\frac{q}{p}$ B. $\frac{p}{q}$ C. $-\frac{q}{p}$ D. $-\frac{p}{q}$

SOLUTION TO MATHEMATICS 2014

1. $\left[\frac{1}{25}\right]^{-1/2} + \left[\frac{1}{8}\right]^{-2/3}$

   $\frac{1}{\left[\sqrt[2]{\frac{1}{25}}\right]^1} + \frac{1}{\left[\sqrt[3]{\frac{1}{8}}\right]^2}$

$\frac{1}{\left[\frac{1}{5}\right]^1} + \frac{1}{\left[\frac{1}{2}\right]^2}$

$\frac{5}{1} + \frac{4}{1} = 5+4 = 9$ **Ans:C**

2. Let $f(x) = x^4 - 11x + 2$

$$x^3 - 11$$
$$x\ \overline{)\ x^4 - 11x + 2}$$
$$\underline{(-)x^4 + 0x + 0}$$
$$-11 + 2$$
$$\underline{(-) - 11x + 0}$$
$$2$$

   $Remainder = +2$ **Ans:A**

3. O² = h² – a²
   O² = 13² - 12²
   O² = 169 − 144
   O² = 25
   O= $\sqrt{25}$
   O = 5
   Cos A $\frac{12}{13}$, Tan A = $\frac{5}{12}$
   $1 + \tan^2 A = 1 + (\frac{5}{12})^2 = 1 + \frac{25}{144} = -\frac{169}{144}$**Ans:D**

4. $\int 1 - 2x$
   $\underline{x^{OH}} - \underline{2x^2} + K$
   $0 +1\quad 1+1$
   $x - x^2 + K$ **Ans:A**

5. $\alpha\beta = \frac{b}{c}$ **Ans:C**

6. a $\otimes$ b = 2a -1
   2 $\otimes$ 1 = 2(2) -1
   4 − 1 = 3
   3 $\otimes$ 3 = 3 (3) − 1
   = 6 -1 = 5 **Ans:C**

7. p(HH, HT, TT, TH)
   p(2 heads) = $\frac{1}{4}$ **Ans:C**

8. $x + 11 < 0$
   $x < 0 - 11$
   $x < -11$
   $\frac{|x|}{x} = \frac{\pm x}{x} = \frac{x}{x}\ or\ \frac{-x}{x}$
   $\frac{|x|}{x} = \frac{x}{x}or\frac{-x}{x}$
   $1\ or - 1$**Ans:C**

9. P = K$\sqrt{Q}$
   20 = K$\sqrt{4}$
   20 = 2K
   K = 10
   Q when P = 100
   100 = 10$\sqrt{Q}$
   $\frac{100}{10} = \sqrt{Q}$
   10 = $\sqrt{Q}$
   10² = Q
   Q = 100 **Ans:C**

10. $x - \sqrt{3}y = 0$
    Divide both sides by $\sqrt{3}$
    $\frac{x}{\sqrt{3}} - \frac{\sqrt{3}}{\sqrt{3}} = \frac{0}{\sqrt{3}}$
    $\frac{x}{\sqrt{3}} - y = 0$
    $y = \frac{x}{\sqrt{3}} - 0$
    From : $y = mx + c$
    m = $\frac{1}{\sqrt{3}}$
    $\tan\theta = m$

$\tan\theta = \frac{1}{\sqrt{3}}$

$\theta = tan^{-1}\frac{1}{\sqrt{3}}$

$\theta = 30^{\circ}$**Ans:A**

11. $6 = kx + 2x^2 = 0$

$2x^2 - kx + 6 = 0.........(1)$

Comparing the equation (1) with $ax^2 + bx + c = 0$

$ca = 2$

$cb = -k$

$C = b$

$b^2 = 4ac$ for equal roots

$(-k)^2 = 4 \times 2 \times 6$

$k^2 = 48$

$k = \sqrt{48}$

$k^2 + 4 = (\sqrt{48})^2 + 4$

$48 + 4\ 52$ **Ans: B**

12. $Log_{100}\sqrt{10^{-1}}$

$Log_{100}(10^{-1})^{1/2}$

$\frac{1}{2}Log_{10}10^{-1}$

$-1 \times \frac{1}{2} Log_{100}10$

$-\frac{1}{2}Log_{10}{}^2 10^1$

$\frac{1}{2} \times -\frac{1}{2} Log_{10}10$

$-\frac{1}{4} \times 1 = -\frac{1}{4}$ **Ans:B**

13. $7(y^2 + 10y) + 7x^2 = 1$

$7y^2 + 10y + 7x^2 = 1$

Divide through by 7

$y^2 + 10y + x^2 = 1/7$

$y^2 + 10y + \left(\frac{10}{2}\right)^2 + x^2 = 1/7 + \left(\frac{10}{2}\right)^2$

$y^2 + 10y + 25 + x^2 = 1/7 + 25$

$(y+5)^2 + x^2 = 176/7$

From the general formular

$(x-h)^2 + (y-k)^2 = r^2$

Where $(x-h)^2$ $(y-k)^2$ represent the centre of the circle and r = radius

Where h and k represent the centre of the circle and r= radius ($y+5)^2 = (y-k)^2$

Square root both sides

$y+5 = y-k$, $y-y+5 = -k$, $5 = -k$, $k=-5$

$x^2 = (x-h)^{2,}$ $x = x-h$, $x-x = -h$, $h = 0$

Centre of the circle = (h,k) = (0,5) **Ans:C**

14. $\int_{-a}^{a} 15x^2 dx = 3430$

$\left[\frac{15x^{2+1}}{2+1}\right]_{-a}^{a} = 3430$

$\left[\frac{15x^3}{3}\right]_{-a}^{a} = 3430$

$[5x^3]_{-a}^{a} = 3430$

$[5a^3] - [5(-a)^3] = 3430$

$5a^3 - (-5a^3) = 3430$

$5a^3 + 5a^3 = 3430$

$10a^3 = 3430$

$a^3 = \frac{3430}{10}$

$a^3 = 343$

$a^3 = \sqrt[3]{343}$

$a = 7$**Ans: C**

15. Let $y = \ln\sin 3x$

Let $u = \sin 3x$

$y = \ln u$

$\frac{dy}{du} = \frac{1}{u}$

$\frac{du}{dx} = 3\cos 3x$

$\frac{dy}{dx} = \frac{dy}{dx} \times \frac{du}{dx}$

$\frac{1}{u} \times 3cos3x$

$\frac{3\cos 3x}{u}$

$But\ u = \sin 3x$

$\frac{3\cos 3x}{\sin x}$

$\frac{\cos 3x}{\sin 3x}$

$3 \times \frac{Cos\ 3x}{Sin\ 3x}$

But $\frac{Cos\ 3x}{Sin\ 3x} = Cos\ 3x$

$= 3 \times \frac{\cos 3}{\sin 3x} = 3\cos 3$

$\frac{dy}{dx} = \frac{d}{dx} = (\ln\ \sin 3x) = 3\cos 3x$**Ans:A**

16. $y - y_1 = m(x - x_1)$

$y_1 = 3$

$x_1 = -2$

$m = \tan A$

$m = \tan 45^{\circ}$

$m = 1$

$y - 3\ 1(x - (-2))$

$y - 3 = 1(x + 2)$

$y - 3 = x + 2$

$y - x = 2 + 3$

$y - x = 5$

$y - x - 5 = 0$**Ans:A**

17. $S = \frac{a}{1-r}$

$S = \frac{1}{1 - \left(\frac{1}{1-(-\frac{1}{1})}\right)}$

$S = \frac{1}{1+1}$

$S = \frac{1}{2}$**Ans:D**

18. $y = 2 - \sin(2-ax)$

$\sin(2 - ax)$

let $2 - ax = u$

$\sin u$

$\frac{dv}{dx} = \cos v\ . -a$

$= -a\cos u$

$= -a\cos 2 - ax$

$\frac{dy}{dx} = 0 - (-a\cos 2 - ax)$

$\frac{dy}{dx} = 0 + a\cos 2 - ax$

$\frac{dy}{dx} = a\cos 2 - ax$**Ans:A**

19. $\left[\frac{\sqrt[8]{n}}{m^{\frac{3}{2}}}\right]^2 \left[\frac{4^{-1}m^2}{2n^{-2}}\right] = \frac{(8\sqrt{n})^2}{m^{\frac{3}{2}}} \times \frac{4^{-1}m^2}{2n^{-2}}$

$\frac{64n}{m^3} \times \frac{\frac{1}{4} \times m^2}{2 \times \frac{1}{n^2}}$

$\frac{64n}{m^3} \times \frac{\frac{m^2}{4}}{\frac{2}{n^2}}$

$\frac{64n}{m^3} \times \frac{m^2 n^2}{8}$

$\frac{64n \times m^2 n^2}{8m^3}$

$\frac{64m^2 n^3}{8m^3}$

$\frac{8n^3}{m} = 8m^{-1}n^3$**Ans:B**

20. $\frac{1}{1+\frac{1}{x^3}} = 0$

$\frac{1}{\frac{x^3+1}{x^3}} = 0$

$\frac{x^3}{x^3+1} = 0$

$x^3 = 0(x^3 + 1)$

$x^3 = 0$

$x = \sqrt[3]{0} = 0$

$x = 0$**Ans: A**

21. $\frac{30}{\sqrt{2}} + \sqrt{50}$

$\frac{30+\sqrt{100}}{\sqrt{2}}$

$\frac{40}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$

$\frac{40\sqrt{2}}{2} = 20\sqrt{2}$**Ans: B**

22. $pq - px - qy = 0$
Comparing this equation with y = mx + c
$qy = -px + pq$
$y = mx + c$
$y = \frac{px}{q} + \frac{pq}{q}$
$y = mx + c$
$m = -\frac{p}{q}$
$1/m = 1/\frac{-p}{q}$
$= -p/q$**Ans:C**

OBAFEMI AWOLOWO UNIVERSITYILE-IFE, NIGERIA
2013 POST-UTME SCREENING EXERCISE
MATHEMATICS

1. If the probability of success in an event is $\frac{y}{x}$. What is the probability of failure?
   A. $\frac{x-y}{x}$ B. $\frac{y-x}{x}$ C. $\frac{x-y}{y}$ D. $\frac{y-x}{y}$

2. What is the circumference of the circle $x^2 + y^2 = \left(\frac{7}{\pi}\right)^2$? A. 16 units   B. 14 units
   C. 15 units   D. 15 units

3. Find the diameter of the circle $2x^2 + 2y^2 - 50 = 0$
   A. -10units B. 14units   C. 25units
   D. -25units

4. Find point of intersection of the lines $3x - 2y = 5$ and $2x + 5y = -7$
   A. $x = \frac{11}{19}, y = -\frac{31}{19}$ B. $x = -\frac{11}{19}, y = \frac{31}{19}$
   C. $x = -\frac{11}{19}, y = -\frac{31}{19}$ D. $x = \frac{11}{19}, y = \frac{31}{19}$

5. Solve $4x^2 + 20x - 24 = 0$ A. 1,6   B. -1,-6
   C. 6,-1   D. -6,1

6. What is the 15th term of the sequence -3,2,7,...?
   A. 65 B. 66 C. 68 D. 67

7. What is the distance between the points (-1,5) and (-7, -3)?
   A. 9   B. 10   C. 11   D. 12

8. Evaluate $\frac{\log\sqrt{27}-\log\sqrt{8}}{\log 3-\log 2}$ A. $\frac{2}{3}$ B. $-\frac{2}{3}$
   C. $\frac{3}{2}$ D. $-\frac{3}{2}$

9. What is the remainder when $x^3 + 5x^2 - 6x + 1$ is divided by $x - 1$?
   A. -1   B. 2   C. -2   D. 1

10. Giving that $-x^2 + 5x + 6 = 0$
    Find $\alpha\beta + \alpha + \beta$

11. What is the value of y for which the function $\frac{y-1}{y+1}$ is undefined?
    A. -1   B. 1   C. 0   D. 2

12. Resolve $\frac{1}{x(1+x)}$ into partial fractions
    A. $\frac{1}{x} + \frac{1}{1+x}$ B. $\frac{1}{1+x} - \frac{1}{x}$
    C. $\frac{-1}{x} - \frac{1}{1+x}$ D. $\frac{1}{x} - \frac{1}{1+x}$

13. Solve the equation $5^{x^2} = 25^{x+4}$ A. -4, 2   B. -4, -2   C. 4, -2   D. 4, 2

14. Evaluate $\sum_{n=2}^{4}(2^n + 1)$ A. 28   B. 31   C. 29   D. 32

15. Integrate $4x^3 + \frac{1}{x}$ with respect to x
    A. $\ln x + x^4 + K$ B. $x^{-1} + x^4 + K$
    C. $12x^2 - x^{-2} + K$ D. $\frac{1}{5}x^5 + x^{-2} + K$

16. If X = {2,3,6,7,8} and Y = {6,7,10,3,17}, find X∩Y
    A. {}   B. 3,6,7
    C. {2,3,6,7,8,10,17} D. {6,3,7}

17. What is the coordinate of centre of the circle $x^2 + y^2 + 2x - 4y = 10$?   A. (-1, -2) B. (1, 2)
    C. (-1, 2)   D. (1, -2)

18. Simplify $\log_x^{x^4} + \log_4^{4^x}$ A. $4x$ B. $-\frac{1}{2}$
    C. $4 + x$ D. $4x\log_{4x}^{4x}$

19. Solve the equation $3^{x+1} = 27^{1-x}$ A. $\frac{1}{2}$ B. $-\frac{1}{2}$
    C. $\frac{3}{4}$ D. $-\frac{3}{4}$

20. Given f(x) = 3 + x and g(x) = 3 − x, find g(f(x)).
    A. 6   B. x C. $-x$ D. 0

21. Differentiate sin $(2x - 5)$ with respect to x.   A. cos(2x - 5)   B. -cos(2x - 5)
    C. 2cos(2x - 5)   D. -2cos(2x - 5)

22. if δ, λ are the roots of equation $x^2 - 5x + 7 = 0$, find the value of $\delta^2 + \lambda^2$
    A. 25   B. -25   C. -11   D. 11

SOLUTION TO MATHEMATICS 2013

1. Let A represent the event success and B represent the event failure. The sum of the probability of A [Pr(A)] and the probability of B [Pr(B)] is always equal to one (1)
   $=> Pr(4) + Pr(B) = 1$
   But $Pr(A) = \frac{y}{x}$
   $\frac{y}{x} + Pr(B) = 1$, $Pr(B) = 1 - \frac{y}{x} = \frac{x-y}{x}$
   Therefore, if $\frac{y}{x}$ is the probability of success, then the probability of failure is $\frac{x-y}{x}$**Ans: A**

2. The general equation of a circle is given as: $x^2 + y^2 + 2gx + 2fy + c = 0$
   The above equation can also be written as $(x - a)^2 + (y-b)^2 = r^2$
   Where a and b are the centre of the circle and r is the radius.
   Since the given equation of the circle is: $x^2 + y^2 = \left(\frac{7}{\pi}\right)^2$, $= \alpha = 0, b = 0, r = \frac{7}{\pi}$
   The circumference of a circle (c) = $2\pi r$
   $c = 2\pi \times \frac{7}{\pi} = 14 \, units$**Ans: B**

3. The general equation of a circle is given as $x^2 + y^2 + 2gx + 2fy + c = 0$

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Where $a = -g$, $b = -f$ and c = (a² + b²)) - r². By comparing the standard equation of a circle [$x2 + y2 + 2gx + 2fy + c = 0$] and the given equation of the circle $(2x^2 + 2y^2 - 50 = 0)$ the values of g, f and c can be obtained. But before the comparism the two equations must be in the same form.

$2^2 + 2y^2 - 50 = 0$

Divide through the equation by 2, $x^2 + y^2 - 25 = 0$

By comparism

$g = 0, f = 0, c = -25$, But $\alpha = -g = 0$, b= -f =0

$c = a^2 + b^2 - r^2$, $-25 = a^2 + b^2 - r^2$

$-25 = 0^2 + 0^2 - r^2$, $-25 = r^2$, $r^2 = 25$

$r^2 = \sqrt{25} = 5$

$Diameter(d) = 2r = 2 \times 5 = 10\ units$ **Ans: B**

4. 3x-2y = 5 ....x 2
    2x + 5y = -7 ....x 3
    $\frac{(-)6x+15y=-21}{-19y=31}$

    y = $-\frac{31}{19}$, But 3x - 2y = 5, $3x - 2\left(-\frac{31}{19}\right) = 5$

    $3x + \frac{62}{19} = 5$, $3x = \frac{5}{1} - \frac{62}{19}$, $= \frac{95-62}{19} = \frac{33}{19}$, $x = \frac{33}{19} \times \frac{1}{3} = \frac{11}{19}$

    $(x, y) = \left(\frac{11}{19} - \frac{31}{19}\right)$ **Ans: A**

5. $4x^2 + 20x - 24 = 0$
    Divide through the equation by 4
    $x^2 + 5x - 6 = 0$
    $(x + 6)(x - 1 = 0)$
    $x = -6\ or\ 1$ **Ans: D**

6. Determine if the sequence is an A.P or G.P. If the sequence is an A.P; $T_2 - T_1 = T_3 - T_2$
    −3,2,7...
    $T_1 = -3$, $T_2 = 2$, $T_3 = 2-3 = 7 - 2$
    Hence the sequence is an A.P. Note that if the sequence is a G.P;
    $\frac{T_2}{T_1} = \frac{T_3}{T_2}$
    $d = T_2-T_1 = 2-3 = 2+3 = 5$
    $T_{15} = a + (\pi - 1)d$
    a = -3, π = 15, & d = 3
    T_{15} = -3 + (15 - 1) X 5
    = -3 + 14 x 5, T_{15} = -3 + 70, T_{15} = 67
    The 15th term of the sequence is 67   **Ans: D**

7. The distance (d) between two points $(x_1 y_1)$ is given as
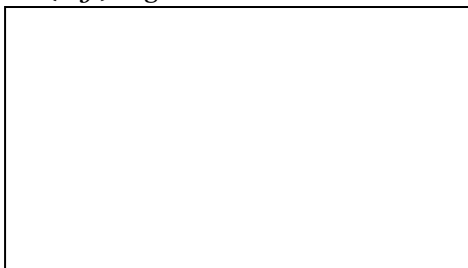
    d= 10 units   **Ans:B**
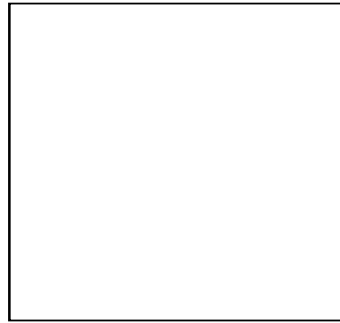
Ans: C

Ans: D

$\alpha\beta = \frac{c}{a} = \frac{6}{-1} = -6$

$\alpha\beta + \alpha + \beta = (\alpha\beta) + (\alpha + \beta) =$

$-6 + 5 = -1$ **Ans: D**

11. For a function to be undefined the denominator mustbe equal to zero
    For $\frac{y-1}{y+2}$ to be undefined y + 1 = 0, y = -1   **Ans: A**

12 A linear factor of the form $ax + b$ always give a partial fraction of the form $\frac{A}{ax+b}$

    $\frac{1}{x(1 + x)} \equiv \frac{A}{x} + \frac{B}{1 + x}$

    $\frac{1}{x(1 + x)} \equiv \frac{A(1 + x) + Bx}{x(1 + x)}$

Since the denominators are equal, the numerator must also be equal

    $1 = A(1 + x) + Bx$
    $1 = A + Ax + Bx$
$1 + 0x = A + (A + B)x$ By comparism

$A = 1$ and $A + B = 0$
    $1 + B = 0 \Rightarrow B = -1$
    $\frac{1}{x(x + 1)} = \frac{1}{x} - \frac{1}{1 + x}$ **Ans: D**

13. $5^{x^2} = 25^{x+4}$
    $5^{x^2} = 5^{2(x+4)}$
    $5^{x^2} = 5^{2x+8}$
    $x^2 = 2x + 8$
    $x^2 - 2x - 8 = 0$
    $x = 4\ or\ -2$ **Ans: C**

14. $\sum_{n=1}^{4}(2^n + 1)$

    To evaluate the above, starts from $n = 2\ to\ n = 4$ and sum up everything.

$$\sum_{n=1}^{4}(2^n+1)$$

$$=(2^2+1)+(2^3+1)+(2^4+1)$$

$$=(4+1)+(8+1)(16+1),\ =\ 5\ +\ 9\ +\ 17\ =\ 31$$
Ans: B

15. $f(x)=4x^3+\dfrac{1}{x}$

$$\int\left(4x^3+\dfrac{1}{x}\right)dx=\dfrac{4x^{3+1}}{3+1}+1nx+c$$

$$=\dfrac{4x^4}{4}+\ln x+c$$

$$=x^4+\ln x+c$$
Ans: A

16. X = (2,3,6,7,8) and)Y = (6,7,10,3,17)

X∩Y = {3,6,8}**Ans: B**

17. The general equation of a circle is given as $x^2+y^2+2gx+2fy+c=0$

Compare the standard equation of a circle with the given equation $x^2+y^2+2x-4y-10=0$

$2gx=2x$, $g=1$, $2fy=-4y$. $F=-2$, $a=-g=-1$, b = -f = 2, (a,b) = (-1,2)

The circle of the circles is (-1,2) **Ans: C**

18. $Log_x^{x^4}+Log_4^{4^x}=4Log_x^x+xLog_4^4$

But $Log_a^a=1$

$\Rightarrow 4Log_x^x+xLog_4^4=4(1)+x(1)$

$=4+x$
Ans: C

Ans: A

Ans: C

21. y = sin(2x-5)
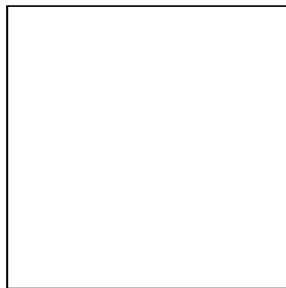
Let u = 2x-5

y = sinu

$\dfrac{dy}{du}=\cos u$

$\dfrac{du}{dx}=2$

$\dfrac{dy}{dx}=\dfrac{dy}{du}\ x\ \dfrac{du}{dx}-\ chain\ rule$

$=\cos u\ x\ 2$

$=2\cos u$

but u = 2x - 5

$\dfrac{dy}{dx}=2\cos u\ (2x-5)$
Ans: C
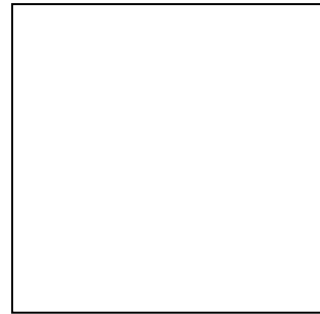
Ans: D

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA
2012 POST-UTME SCREENING EXERCISE
MATHEMATICS

1. What is the highest possible value of $\dfrac{8}{1+x^2}$ If $0\le x\le 3$? (a) 8 (b) 4 (c) 2 (d) 16

2. The fifth term in the progression $9,27,81,...$ is (a) 243 (b) 3^7 (c) 729 (d) 3^8

3. The interior angles of an hexagon are $120^o,100^o,80^o,150^o,x$ and 130°. The value of x is (a) 170° (b) 20° (c) 120° (d) 140°

4. Obtain the product of 1100_2 and 101_2 (a) 111100_2 (b) 110100_2 (c) 2220_5 (d) 1144_7

5. Simplify $\left(\dfrac{8\sqrt{n}}{m^{\frac{3}{2}}}\right)^2\left(\dfrac{4^{-1}m^2}{2n^{-2}}\right)$ (a) $128n^3m^{-1}$ (b) $8n^3m^{-1}$ (c) $8n^4m$ (d) $8n^3m$

The universal set U consists of all integers subsets of U are defined as:
$A=\{y:y\le 3\}$ $B=\{y:-5<y<12\}$
$C=\{y:-2\le y<5\}$

Use the information above to answer question 6.

6. $A\cap(B\cup C)'$ is (a) $\{y<-4\}$ (b) ∅ (c) $\{y<0\}$ (d) $\{-4\le y\le 3\}$

7. Make k the subject of the formular $m=\dfrac{2nk}{p}+\dfrac{k}{2p}$
(a) $k=\dfrac{2mp}{2n+1}$ (b) $k=\dfrac{2mp}{4n+1}$ (c) $k=\dfrac{mp}{2n+1}$ (d) $k=\dfrac{2n+1}{2mp}$

8. Evaluate $\log_8 128+\log_3 9$ (a) 19 (b) 48 (c) $\dfrac{13}{3}$ (d) 6

9. Find the value of y if $\dfrac{1}{2}\log_3 y=2$ (a) 9 (b) 18 (c) $\dfrac{9}{2}$ (d) 81

10. Which of the following is a perfect square? (a) x^2-3x-4 (b) x^2+9x+9 (c) $2x^2+2x+2$ (d) x^2+2x+1

11. Integrate $\sqrt{2x+1}$ (a) $\dfrac{1}{3}(2x+1)^{\frac{3}{2}}+K$ (b) $\dfrac{1}{3}(2x+1)^{\frac{3}{2}}+K$ (c) $-\dfrac{1}{3}(2x+1)^{\frac{3}{2}}+K$ (d) $-\dfrac{1}{3}(2x+1)^{\frac{3}{2}}+K$

12. Obtain the centre of the circle $3y^2+3(x+5)^2=17$ (a) (0.5) (b) (-5.0) (c) (0.-5) (d) (5.0)

13. If $f(x+1)=\dfrac{x^2+1}{x^3}$, find $f(2)$ (a) $\dfrac{5}{8}$ (b) 2 (c) $\dfrac{1}{4}$ (d) 1

14. The quadratic equation whose roots are $(x-3)$ and $\left(x+\dfrac{1}{3}\right)$ is (a) $x^2+\dfrac{8}{3}x-1=0$ (b) $x^2-2x-3=0$ (c) $x^2-\dfrac{8}{3}x-1=0$ (d) $x^2-3=0$

15. If the bearing of a town B from A is 145°, the bearing of A from B is (a) 305° (b) 325° (c) 35° (d) 145°

16. A number is selected randomly from the set of integers 1 to 30 inclusive. The probability that the number is prime is (a) $\frac{4}{15}$ (b) $\frac{1}{3}$ (c) $\frac{3}{15}$ (d) $\frac{7}{30}$

17. Differentiate $\cos ax$ with respect to x (a) $a \sin ax$ (b) $\frac{1}{a} \sin ax$ (c) $-a \sin ax$ (d) $-\frac{1}{a} \sin ax$

18. Obtain the values of x in $|x - 9| = 16$ (a) 25 (b) -7 (c) $25, -7$ (d) $-25, 7$

19. Which of these numbers is an irrational number (a) $\sin 0^o$ (b) $\sin 30^o$ (c) $\sin 60^o$ (d) $\sin 90^o$

20. Given $\int_{-a}^{a} 15x^2 dx = 3430$, find the value of the constant a (a) 8 (b) 6 (c) 7 (d) 9

21. Which of these lines is a right angle with the line $x = -7$ (a) $2x + y = -1$ (b) $2x - y = 1$ (c) $y = 0$ (d) $x = 49$

The scores of students in a class test are shown in the table below. Use the information to answer question 22.

Scores	1	2	3	4	5	6	7	8
No of students	0	1	3	5	3	4	2	0

The modal score is (a) 5 (b) 4 (c) 6 (d) 8

SOLUTION TOMATHEMATICS 2012
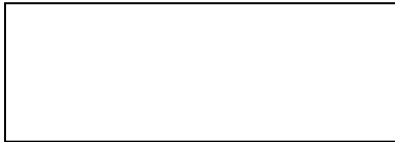
Ans: A
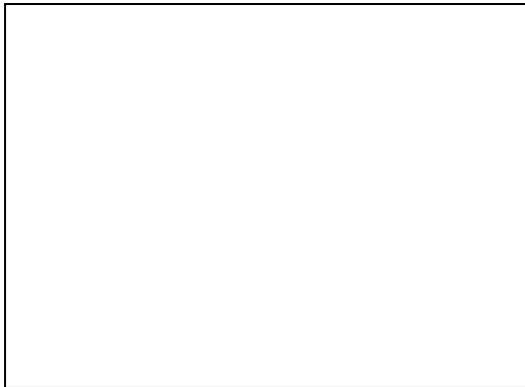
Ans: C

3. Sum of interior angle = $(n - 2) \times 180$
   For hexagon $(n) = 6$
   Sum of interior angle = $(6 - 2) \times 180$
   $= 4 \times 180$
   $= 720$
   $120 + 100 + 80 + 150 + x + 130$
   $= 720$
   $580 + x = 720$
   $x = 720 - 580$
   $x = 140^o$

   Ans: D

4. $1100_2 \times 101_2 = 111100$ **Ans: A**
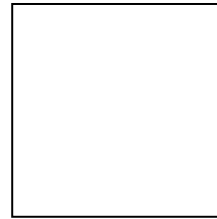
Ans: B

6. $U = \{...,-3,-2,-1,0,1,2,...\}$
   $A = \{...-3,-2,-1,0,1,2\}$
   $B = \{-4, -3, -2, -1,0,1,...11\}$
   $C = \{-2,-1,0,1,2,3,4\}$
   $(B \cup C) = \{...,-5,12,13,...\}$
   $An (B \cup C) = \{..., -5\}$
   $= \{y < -4\}$ **Ans: A**

7. $m = \frac{2nK}{p} + \frac{K}{2p}$
   $m = \frac{4nK + K}{2P}$
   $2mp = K(4n + 1)$
   $K = \frac{2mP}{4m+1}$ **Ans: B**
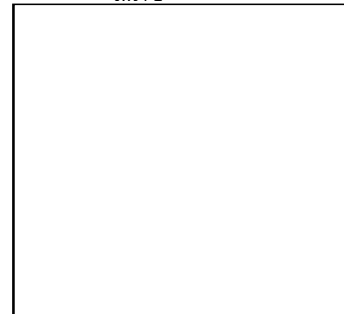
Ans: C
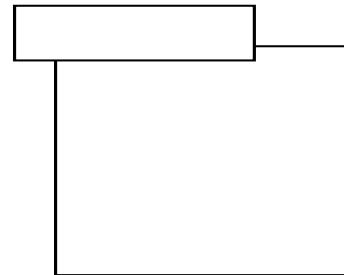
Ans: D
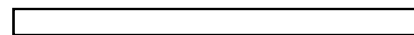
Ans: D

11. $y = \sqrt{2x + 1}$
    $y = (2x + 1)^{1/2}$
    $Let\ U = 2x + 1$
    $y = u^{1/2}$
    $\frac{du}{d} = 2$
    $dx = \frac{du}{2}$
    $\int u^{1/2} dx$
    $\int u^{\frac{1}{2}} \cdot \frac{du}{2}$
    $\frac{1}{2} \int u^{\frac{1}{2}} du$
    $\frac{1}{2} \left[\frac{u^{\frac{3}{2}}}{\frac{3}{2}}\right] + K$
    $\frac{1}{2} \left[\frac{2}{3} u^{\frac{3}{2}}\right] + K$
    $\frac{1}{3} u^{\frac{3}{2}} + K$
    $But\ u = 2x + 1$
    $\frac{1}{3} (2x + 1)1^{\frac{3}{2}} + k$

$\frac{1}{3}(2x+1)^{\frac{3}{2}} + k$ **Ans: A**

12. $3y^2 + 3(x+5)^2 = 17$
$3y^2 + 3(x^2 + 10x + 25) - 17 = 0$
$3y^2 + 3x^2 + 30x + 75 - 17 = 0$
$3y^2 + 3x^2 + 30x + 58 = 0$
Divide through by 3, $y^2 + x^2 -1- 10x + -\frac{58}{3} = 0 \dots\dots\dots (1)$
Compare equation 1 with the standard of a cycle.
$x^2 + y^2 + 2gx + 2/y = c = 0$
$= 2gx = 10x$
$g = 5$
$2fy = 0, f = 0, (a, b) = (-g,-f) (a, b) = (-5,0)$
    Ans: B

13. $f(x+1) = \frac{x^2+1}{x^3}$
$f(x+1) = f(2)$
$x + 1 = 2$
$x = 2 - 1 = 1$
$x = 1$
$f(1) = \frac{1^2+1}{1^3} = \frac{1+1}{1} = \frac{2}{1} = 2$
$f(1) = 2$
    Ans: B

14. $(x-3)\left(x+\frac{1}{3}\right) = x^2 + \frac{1}{3}x - 3x = 0$
$x^2 - \frac{8}{3}x - 1 = 0$**Ans: C**

15. A
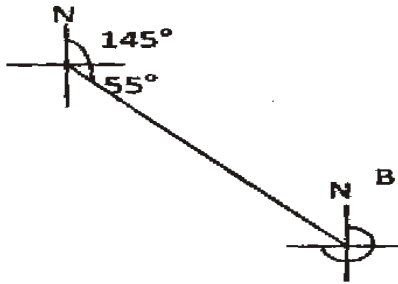
Bearing of A from B = 90 + 90 + 90 + 55 = 325°
    Ans: B

16. The prime number between 1 - 30 are 2, 3. 5, 7, 11, 13. 17, 19,23,29
$E = \{2,3,5,7,11,13,17,19,23,29\}$
$S = \{1,2,3, \dots 30\}$
$Pr(prime) = \frac{n(E)}{n(S)}$
$= \frac{10}{30}$
$= \frac{1}{3}$
    Ans: B

17. $y = \cos ax$
$\frac{dy}{dx} = -a\sin ax$**Ans: C**

18. $|1 - 9| = 16$
$x - 9 = 16 \dots\dots (1)$
$-(x - 9) = 16 \dots\dots (2)$
From equation 1
$x = 16 + 9 = 25$
From equation 2
$-x + 9 = 16$
$-x = 16 - 19$
$-x = 7$

$x = -7$
$x = -7, 25$**Ans:C**

19. $Sin\ 0^0 = 0$
$\sin 30 = 0.5 = \frac{1}{2}$
$\sin 60 = \frac{\sqrt{3}}{2}$
$\sin 90 = 1$
$\frac{\sqrt{3}}{2}$ is an irrational number   **Ans: C**

20. $\int_{-a}^{a} 15x^2 dx = \left[\frac{15x^3}{3}\right]_{-a}^{a}$
$[5x^3]_{-a}^{a} = 5a^3 - [5(-a)^3]$
$= 5a^3 - (-5a^3)$
$= 5a^3 + 5a^3$
$= 10a^3$
$\int_{-a}^{a} 15x^2 dx = 10x^3$
$\int_{-a}^{a} 15x^2 dx = 3430$
$10a^3 = 3430$
$a^3 = 343$
$a^3 = 7^3$
$a = 7$
    Ans: C

21.
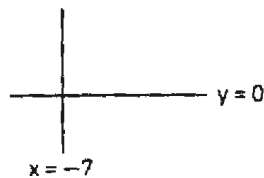
The line $x = -7$ and y = 0 are perpendicular (at 90°) to each other. **Ans: C**

22. The modal score is the score with the highest frequency which is 4   **Ans:B**

**OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE, NIGERIA
2011 POST-UTME SCREENING
EXERCISE
MATHEMATICS**

1. If the universal set U ={1,2,3,4,5,6,7,8,9,10}, M = {1,3,5,7,9)}and N = {2,4,6,8,10}, which of the following is equal to $(M\ U\ N)'$? A. $(M \cap N)'$ B. $M'U\ N'$, C. $M' \cap N'$, D. $M \cap N$.

2. $\cos(180 - \theta)$ is equivalent to A. $\cos(\theta - 180)$, B. $\cos\theta$, C. $-\cos\theta$, D. $-\cos(180 + \theta)$.

3. Find the equation of the circle with centre (-1,3) and radius 4. A. $x^2+y^2 - 6x + 2y = 6$, B. $x^2 + y^2 + 2x - 6y = 16$, C. $x^2 + y^2\_6x + 2y = 16$, D. $x^2 + y^2 + 2x-6y = 6$.

4. Find $\frac{dy}{dx}$, if $y = \frac{3}{\sqrt{x}}$ A.$-\frac{3}{2}x^{\frac{-3}{2}}$
B. $3x^{\frac{-3}{2}}$ C.$\frac{3}{2}x^{\frac{-3}{2}}$ D. $\frac{3}{4}x^{\frac{-3}{2}}$.

5. Integrate $\frac{1}{2x}$ A. not defined, B. 0   C. $\frac{1}{2}\ln x + C$ D. $\frac{1}{4}x^2 + C$

6. A die is tossed twice. What is the probability of obtaining a total of 6 if both numbers are odd?
A. $\frac{1}{12}$ B. $\frac{1}{18}$ C. $\frac{5}{36}$ D. $\frac{1}{6}$.

7. If the mean of the numbers a,b,c,d,e is x, find the mean of numbers $a + k$, $b + 2k$, $c - k$, $d - 2k$, e.
A. x B. $x + k$, C $x - k$, D. $2x$

8. Factorize: $a^2 - b^2 + (a + b)^2$ A. $2a^2$, B. $2a(a - b)$, C. $2a(a + b)$, D. $2b(b - a)$

9. Let α and β be roots of quadratic equation $x^2 + 2x - 3 = 0$, then αβ is A. -3, B. -2, C. 2, D. 6.

10. Convert 69_{10} to a number in base two
A. 1001101, B. 1010001, C.1000101, D. 100101.

11. The reciprocal of $\frac{\frac{3}{4}}{\frac{1}{4} + \frac{1}{3}}$ is A. $1\frac{2}{7}$ B. $\frac{7}{9}$ C. $-1\frac{2}{7}$ D. $-\frac{7}{9}$

12. The speed of 30 kilometres per minute, expressed centimeters per second is
A. 5   B. 50   C. 500   D. 5000.

13. Evaluate x if,$\log_4(x + 3)(x - 3) = 2$ A. 3 or -3, B. 5 or -5, C. 5 or -3, D. 3 or -5.

14. Given that $a = \frac{1}{2-\sqrt{3}}, b = \frac{1}{2+\sqrt{3}}$, find the value of $a^2 + b^2$ A. $\frac{14}{37}$ B. 7 C. $14 + 2\sqrt{3}$ D. 14

15. If the binary operation * is defined as x * y = 2, find 2 * (4 * 5) A. 4 , B. 5, C. -5, D. 2

16. Find the value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6}}}}}$ A. -2, B. 2, C. 6, D. 3.

17. Find the value of $\int_0^{\frac{\pi}{2}}(2\pi + 2cos2x)dx$ A. $\pi^2 + 1$ B. π^2 C. $\pi^2 - 4$ D. $\pi^2 + 3$

18. The circle $2x^2 + 2(y - \frac{3}{2})^2 = 2$ has centre and radius respectively as
A. $(0, \frac{3}{2})$ and 2 B. $(0, \frac{-3}{2})$ and 1 C. $(\frac{3}{2}, 0)$ and 2 D. $(0, \frac{3}{2})$ and 1.

19. The line perpendicular to the straight line $y + \frac{3}{2}x - 1 = 0$ has the gradient A. $-\frac{2}{3}$, B. $\frac{3}{2}$, C. 3, D. $\frac{2}{3}$

20. Find x if $2^{x^2} = 4^{(x+4)}$A. 2 or 4, B. -2 or 2, C.-4 or 4, D. -4 or 2.

21. Express in partial fraction$\frac{3x}{x^2-1} \equiv \frac{A}{x-1} + \frac{B}{x+1}$. Then A and B respectively is
A. $-3,3$ B. $\frac{2}{3}, \frac{2}{3}$ C. $-\frac{3}{2}, -\frac{3}{2}$ D. $\frac{3}{2}, \frac{3}{2}$

22. A square has a perimeter of 40cm. What is its area in cm square? A. 80 B. 1600 C. 100 D. 160

SOLUTION TO MATHEMATICS 2011
1. $\mu = \{1,2,3,4,5,6,7,8,9,10\}$
$M = \{1,3,5,7,9\}$
$N= \{2,4,6,8,10\}$
$M' = \mu - M$
$= \{1,2,3,4,5,6,7,8,9,10\} - \{1,3,5,7,9\} = \{2,4,6,8,10\}$
$N' = \mu - N = \{1,2,3,4,5,6,7,8,9,10\} - \{2,4,6,8,10\} = \{1,3,5,7,9\}$
$M \cap N = \{1,3,5,7,9\} \cap \{2,4,6,8,10\} = \emptyset$

$(M \cap N)' = \mu - (M \cap N)$
$= \{1,2,3,4,5,6,7,8,9,10\} - \emptyset$
$(M \cap N)' = \{1,2,3,4,5,6,7,8,9,10\} = \mu$
$M' \cup N' = \{2,4,6,8,10\} \cup \{1,3,5,7,9\}$
$= \{1,2,3,4,5,6,7,8,9,10\} = \mu$
$(M' \cup N') = \{2,3,4,6,8,10\} - \{1,3,5,7,9\} = \emptyset$
$(M \cup N)' = \mu - (N \cup M)$
$\{1,2,3,4,5,6,7,8,9,10\} - \{1,2,3,4,5,6,7,8,9,10\}$
$(M \cup N)' = \emptyset$
$(M \cup N)' = M' \cap N' = M \cap N$
$Note\ that\ by\ De - Morgan's\ law$
$(M \cup N)' = M' \cap N'$ **Ans: C and D**

2. $cos (180 - \theta) = -Cos\theta$
$sin (180 - \theta) = -Sin\theta$
$tan (180 - \theta) = -Tan\theta$**Ans: C**

3. The standard equation of a circle is
$x^2 + y^2 + 2gx + 2fy + C = 0$
Where $g = -a, f = -b$ and $c = a^2 + b^2 + r^2$
The centre of the circle $(a,b) = (-1,3) = a = -1$ and $b = 3$
The radius of the cirle (r) = 4
$g = -a = -(-1) = 1$
$f = -b = -3$
$r = 4$
$C = a^2 + b^2 - r^2$
$= 1^2 + (-3)^2 - 4^2$
$1 + 9 - 16$
$10 - 16 = -6$
$x^2 + y^2 + 2gx + 2fy + C = 0$
$x^2 + y^2 + 2(1)x + 2(-3)y - 6 = 0$
$x^2 + y^2 + 2x - 6y - 6 = 0$
$x^2 + y^2 + 2x + 6y = 6$**Ans: D**
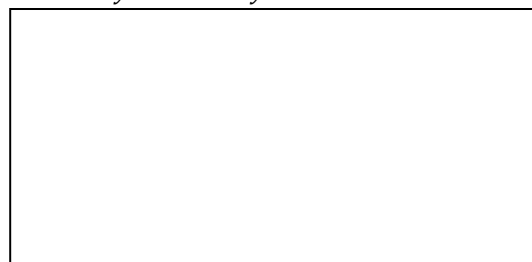
Ans: A

Ans: C
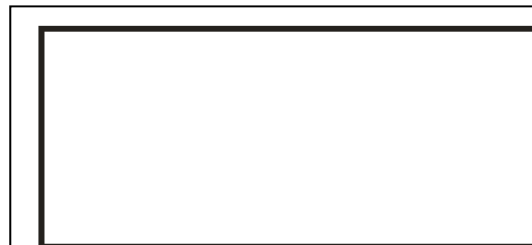
Total number of sample space (s) =36
$n(s)= 36$
$n(E) = 3$
Note that the number of 6 obtain from odd numbers are circle in the table above.
Let the event of obtaining a total of 6 if both numbers are odd be E

$\Pr(E) = \frac{n(E)}{n(s)} = \frac{3}{36} = \frac{1}{12}$ **Ans: A**

7. $\bar{x} = \frac{\varepsilon x}{n}$

   If the meaqn of a, b, c, d, e, is x then;

   $x = \frac{a+b+c+d+e}{5}$

   $5x = a + b + c + d + e \dots \dots (1)$

   $\bar{x} = \frac{\varepsilon x}{n}$

   $\bar{x} = \frac{(a+k)+(b+2k)+(c-k)+(d-2k)+e}{5}$

   $\bar{x} = \frac{(a+b+c+d+e)+(k+2k-k-2k)}{5}$

   $\bar{x} = \frac{5x+0}{5} = x$ **Ans: A**

8. $a^2 - b^2 = (a+b)(a-b)$

   $a^2 - b^2 - (a+b)^2$

   $\qquad (a+b)(a-b) + (a+b)^2$

   $\qquad\qquad (a+b)(a-b+a+b)$

   $\qquad\qquad\qquad (a+b)(2a)$

   $2a(a+b)$ **Ans: C**

9. $x^2 + 2x - 3 = 0$

   $a = 1, b = 2$ and $c = -3$

   $\alpha + \beta = -\frac{b}{a}$ and $\alpha\beta = \frac{c}{a}$

   $\alpha\beta = -\frac{3}{1} = -3$ **Ans: A**

10.

2	**69**
2	34 R1
2	17 R0
2	8 R1
2	4 R0
2	2 R0
2	1 R0
	0 R1

   $69_{10} = 1000101_2$ **Ans: C**

11. $\frac{\frac{3}{4}}{\frac{1}{4}+\frac{1}{3}} = \frac{\frac{3}{4}}{\frac{3+4}{12}} = \frac{\frac{3}{4}}{\frac{7}{12}}$

   $\frac{3}{4} \div \frac{7}{12} = \frac{3}{4} X \frac{12}{7} = \frac{3 X 3}{7} = \frac{9}{7}$

   The reciprocal or inverse of

   $\frac{\frac{3}{4}}{\frac{1}{4}+\frac{1}{3}}$ *is* $\frac{\frac{1}{3}}{\frac{4}{\frac{1}{4}+\frac{1}{3}}}$

   But $\frac{\frac{3}{4}}{\frac{1}{4}+\frac{1}{3}} = \frac{9}{7}$

   Reciprocal $= \frac{1}{\frac{9}{7}} - \frac{7}{9}$ **Ans: B**

12. $V = \frac{30 Km}{min}$

   $V = \frac{30km}{1min} X \frac{1000m}{1km} X \frac{100cm}{1m} X \frac{1min}{60secs}$

   $\frac{30 X 1000 X 100cm/s}{60} = 50,000 cm/s$ **No   correct**

   answer in the options

13. $log_4[(x+3)(x-3)] = 2$

   If $log_b^p =$ then $P = b^x$

   $[(x+3)(x-3)] = 4^2$

$x^2 = 9 = 16$

$x^2 + 16 + 9 = 25$

$x = \sqrt{25} = \pm 5$

$x = 5 \text{ or } -5$ **Ans: B**

14. $a = \frac{1}{2-\sqrt{3}} X \frac{2+\sqrt{3}}{2+\sqrt{3}}$

   $= \frac{2+\sqrt{3}}{(2-\sqrt{3})(2+\sqrt{3})}$

   $= \frac{2+\sqrt{3}}{4-3}$

   $a = 2 + \sqrt{3}, a^2 = (2+\sqrt{3})^2 = 4 + 4\sqrt{3} + 3 = 7 + 4\sqrt{3}$

   $b = \frac{1}{2\sqrt{3}} X \frac{2-\sqrt{3}}{2-\sqrt{3}}$

   $= \frac{2-\sqrt{3}}{(2+\sqrt{3})(2-\sqrt{3})}$

   $b = \frac{2-\sqrt{3}}{4-3} = 2 - \sqrt{3}$

   $b^2 = (2-\sqrt{3})^2 = 4 - 4\sqrt{3} + 3 = 7 - 4\sqrt{3}$

   $a^2 + b^2 = 7 + 4\sqrt{3} + 7 - 4\sqrt{3}$

   $7 + 7 = 14$ **Ans: D**

15. $x * y = 2$

   In $2 * (4 * 5)$ *we find* $4 * 5$ *first*

   $x * y = 2$

   $4 * 5 = x = 4$ and $y = 5$

   $\therefore x * y = 4 * 5 = 2$

   $= 2 * (4 * 5) = 2 * 2$

   $2 * 2 = x = 2$ and $y = 2$

   $x * y = 2 * 2 = 2$

   $\therefore 2 * (4 * 5) = 2$ **Ans: D**

16. *Let* $x = \sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}}$.

   Square both side to remove the first square root sign or the radical sign ($\sqrt{}$)

   $x^2 = \left(\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}}\right)$

   $x^2 = 6 + \left(\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}}\right)$

   $x^2 - 6 = \left(\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}}\right)$

   But $x = \left(\sqrt{6 + \sqrt{6 + \sqrt{6 + \sqrt{6 + \cdots}}}}\right)$

   $x^2 - 6 = x$

   $x^2 - x - 6 = 0$

   $x = 3$

   Note that the value of the expression cannot benegative. **Ans: D**

17. $\int_0^{\frac{\pi}{2}}(2\pi + 2Cos2x)dx$

   Note that $\int \cos nx = \frac{1}{n} Sin nx$

   $\int 2\pi dx = 2\pi$

   $\int_0^{\frac{\pi}{2}}(2\pi + 2Cos2x)dx \left[2\pi x + \frac{2sin2x}{2}\right]_0^{\frac{\pi}{2}}$

Page 23

$$[2\pi x + \sin 2x]_0^{\frac{\pi}{2}}$$
$$\left[2\pi\left(\frac{\pi}{2}\right) + \sin 2\left(\frac{\pi}{2}\right)\right] - [2\pi x(0) + \sin 2(0)]$$
$$(\pi^2 + \sin\pi) - (0 + \sin 0)$$
$$\sin 0 = 0 \text{ and } \sin\pi = 0$$
$$\int_0^{\frac{\pi}{2}}(2\pi + 2\cos 2\pi)\,dx = \pi^2 \quad \textbf{Ans: B}$$

18. $2x^2 + 2\left(y - \frac{3}{2}\right)^2 = 2$

$2x^2 + 2\left(y^2 - 3y + \frac{9}{4}\right) = 2$

$2x^2 + 2y^2 - 6y + \frac{9}{2} = 2$

Divide through by 2

$x^2 + y^2 - 3y + \frac{9}{4} = 1$

$x^2 + y^2 - 3y = 1 - \frac{9}{4}$

$x^2 + y^2 - 3y = \frac{4-9}{4} = \frac{-5}{4}$

$x^2 + y^2 - 3y + \frac{5}{4} = 0$

$x^2 + y^2 + 0x - 3y + \frac{5}{4} = 0 \dots\dots(i$

Compare equation (i) with the standard equation circle.

$x^2 + y^2 + 2gx + 2fy + c = 0$

$2gx = 0$

$= g = 0$

$2f\,y = -3y$

$2f = -3$

$f = \frac{-3}{2}$

But $g = -a$

$a = 0$

$f = -b$

$\frac{-3}{2} = -b$

$b = \frac{3}{2}$

$c = a^2 - b^2 - r^2$

$\frac{5}{4} = 0^2 + \left(\frac{3}{2}\right)^2 - r^2$

$r^2 = \frac{9}{4} - \frac{5}{4} = \frac{9-5}{4} = \frac{4}{4} = 1$

$r^2 = 1$

$r = \sqrt{1} = 1$

Centre of the circle $(a, b) = \left(0, \frac{3}{2}\right)$

The radius of the circle $(r) = 1\ unit$ **Ans: D**

19. $y + \frac{3}{2}x - 1 = 0$

$y = \frac{-3}{2}x + 1$

$m_1 = \frac{-3}{2}$

The gradient of the line; $y + \frac{3}{2}x - 1 = 0$ is $\frac{-3}{2}$ Let the gradient of the perpendicular line to the given line be m_2.

For two perpendicular line; $m_1 m_2 = -1$

$\frac{-3}{2}m_2 = -1$

$m_2 = \frac{2}{3}$ **Ans: D**

20. $2^{x^2} = 4^{(x+4)}$

$2^{x^2} = 2^{2(x+4)}$

$2^{x^2} = 2^{2x+8}$

If $a^x = a^y$ then $x = y$

$x^2 = 2x + 8$

$x^2 = 4\ or\ -2 \quad \textbf{Ans: A}$

21. $\frac{3x}{x^2-1} = \frac{3x}{(x-1)(x+1)} = \frac{A}{x-1} + \frac{B}{x+1}$

$\frac{3x}{(x-1)(x+1)} = \frac{A(x+1)+B(x-1)}{(x-1)(x+1)}$

$3x = A(x + 1) + B(x + 1)$

Let $x = 1$

$3(1) = A(1 + 1) + B(1 - 1)$

$3 = 2A + B(0)$

$3 = 2A$

$A = \frac{3}{2}$

Let $x = -1$

$3(-1) = A(-1 + 1) + B(-1 - 1)$

$-3 = A(0) + B(-2)$

$-3 = -2B$

$(A, B) = \left(\frac{3}{2}, \frac{3}{2}\right)$ **Ans: D**

22.

$P = 4l$

$40cm = 4l$

$l = 10cm$

$A = l^2 = 10^2 = 100$

If the shape is a triangle the steps below will be applied
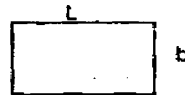
$P = 2(l + b)$

$P = 40cm$

$2(l + b) = 40cm$

$l + b = 20cm$

$l = 20 - b \dots\dots\dots\dots (1)$

$A = lb = (20 - b)b$

$A = 20b - b^2 \dots\dots\dots\dots (2)$

To obtain the maximum breadth and length differentiate equation 2 with respect to b. since maximum or minimum is a turning point $\frac{dA}{db} = 0$

$\frac{dA}{db} = 20 - 2b = 0$

$2b = 20$

$b = 10$

$l = 20 - b = 20 - 10 = 10$

$l = 10cm$

$b = 10cm$

$A = l \times b = 10 \times 10 = 100cm^2$

Ans: C

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2010 POST-UTME SCREENING EXERCISE POST UME 2010 MATHEMATICS

1. Find x if $x^2 - 2x - 15 = 0$ (a) 3, -5 (b) -3, 5 (c) 1, 15 (d) -2, -15

2. A father leaves a legacy of ₦45 million for his children – Peter, David and Paul to be shared in the ratio 7:5:3. What amount in million Naira would each receive respectively? (a) ₦14, ₦7, ₦3

(b) ₦15, ₦5, ₦3   (c) ₦21, ₦15, ₦9   (d) ₦20, ₦16, ₦10

3. As θ tends to zero, what does Cosθ tend to? (a) sin θ   (b) 0   (c) ½   (d) 1

4. The expression $2Cos\theta + Sin^2\theta$ has the numerical value   (a) 1   (b) 2   (c) 4   (d) 0

5. If $\tan x = \frac{sinx}{\cos x}$, find $\tan(90^0 + x)$ for acute value of x. (a) −cot x (b) −tan x (c) cot x (d) tan x

6. Evaluate the length of perpendicular from A to BC (a) $\frac{\sqrt{52}}{12}cm$ (b) $\frac{12}{\sqrt{52}}cm$ (c) $\frac{24}{\sqrt{52}}cm^2$ (d) $\frac{24}{\sqrt{52}}cm$

7. The indefinite integral of xe^x, for any real constant c is (a) c   (b) $x + e^x + c$ (c) $x^2 + e^x + c$ (d) $e^x(x-1) + c$

8. Find the area under the curve $y(x) = \sin x$ between $x = 0$ and $x = \pi$ (a) 2 (b) 1 (c) -2 (d) π

9. Let the letters P, Q, R and S denote parallelogram, quadrilateral, rectangle and square respectively. Using subset notation, which of these inclusions is correct? (a) $Q \subset R \subset P \subset S$ (b) $R \subset Q \subset P \subset S$ (c) $S \subset P \subset R \subset Q$ (d) $S \subset R \subset P \subset Q$

10. In a convex polygon with n sides, the sum of interior angles is (a) (n-2)π (b) 2(n-1)π (c) 4(n-1)π (d) (2n+4) π

11. Find the equation of the line perpendicular to the line $y = 2x + 1$ and passing through a point (3, 1). (a) $y = \frac{1}{2}x + \frac{5}{2}$ (b) $y = -\frac{1}{2}x + \frac{5}{2}$ (c) $y = x + 5$ (d) $2y = x + 5$

12. What is the distance between points (1,2) and (4,5) on a plane? (a) $3\sqrt{2}$ (b) $2\sqrt{3}$ (c) 3 (d) 9

13. Integrate $\int 2\tan(2x + \pi) dx$
    (a) $2\cot(2x + \pi) + k$ (b) $\log[cos2x + \pi)] + k$
    (c) $-\log[cos2x + \pi)] + k$ (d) $4\cot(2x + \pi) + k$

14. Find the values of x for which $5 + 2x - 3x^2 = 0$ (a) -2 and $\frac{6}{5}$ (b) -1 and $\frac{5}{3}$ (c) -2 and -1 (d) $\frac{6}{5}$ and $\frac{5}{3}$

15. If $\left(\frac{3}{4}\right)^x \left(\frac{2}{3}\right)^y = \frac{32}{27}$, find the value of $3y - 2x$ (a) -1   (b) 7   (c) 1   (d) -7

16. The integral value of y which satisfy the inequality $-1 < 5 - 2y \le 7$ are   (a) -1, 0, 1, 2 (b) 0, 1, 2, 3   (c) -1, 0, 2, 3   (d) -1, 0, 2, 3

17. If $x^2 - 5x + 6 = (x - a)^2 + b$, the value of b is   (a) $-\frac{1}{4}$ (b) $\frac{5}{2}$ (c) 2   (d) 3

18. The scores of 16 students in a mathematics test are 65, 65, 55, 60, 60, 65, 60, 70, 75, 70, 65, 70, 60, 65, 65, 70. What is the sum of the median and modal scores? (a) 125 (b) 130 (c) 140 (d) 150.

19. A businessman invested a total of ₦200,000 in two companies which paid dividends of 5% and 7% respectively. If he received a total of ₦11,600, how much did he invest at 7%? (a) ₦140,000   (b) ₦160,000   (c) ₦80,000   (d) ₦100,000

20. If $a\sqrt{5} + b\sqrt{2}$ is the square root of $95 - 30\sqrt{10}$, the values of a and b are, respectively (a) 5, 2 (b) 2, -5 (c) -5, 3 (d) 3, -5

21. If $\frac{x}{y} = \frac{z}{w} = c$, find the value of $\frac{3x^2 - xz + z^2}{3y^2 - yw + w^2}$ in terms of c. (a) $3c^2$ (b) $\frac{17c^2}{4}$ (c) $2c - c^2$ (d) c^2

22. Express $\frac{5y-12}{(y-2)(y-3)}$ in partial fractions
    (a) $\frac{2}{y-2} - \frac{3}{y-3}$ (b) $\frac{2}{y-2} + \frac{3}{y-3}$
    (c) $\frac{2}{y-3} - \frac{3}{y-2}$ (d) $\frac{5}{y-3} - \frac{4}{y-2}$

23. The second term of an infinite geometric series is $-\frac{1}{2}$ and the third term is $\frac{1}{4}$. Find the sum of the series. (a) 2   (b) 1   (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

24. In the figure AB and AD are tangents to the circle. If BCD = 55º and BDC = 48º, find BAD.

(a) 80⁰   (b) 70⁰   (c) 110⁰ (d) 55⁰
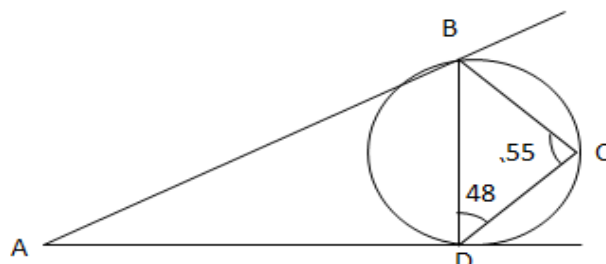
25. Find the area of triangle: (a) 24cm   (b) 24cm²   (c) 12cm²   (d) 12cm

SOLUTION TO MATHEMATICS 2010

1. $x^2 - 2x - 15 = 0$
   $x^2 - 5x + 3x - 15 = 0$
   $(x^2 - 5x) + (3x - 15) = 0$
   $x(x - 5) + 3(x - 5) = 0$
   $(x + 3)(x - 5) = 0$
   $x = -3$ or 5 **Ans: B**

2. Total ratio = 7 + 5 + 3 = 15
   Peter's share = $\frac{7}{15} \times ₦45M = ₦21M$
   David's share = $\frac{5}{15} \times ₦45M = ₦15M$
   Paul's share = $\frac{3}{15} \times ₦45M = ₦9M$
   The amount in million received by Peter, David and Paul are respectively ₦21, ₦15 & ₦9 million **Ans: C**

3. Lim Cosθ
   θ→ 0
   = Cosθ = 1 **Ans: D**

4. $2Cos\theta + Sin^2\theta$
   But $Sin^2\theta = 1 - Cos^2\theta$
   $2Cos\theta + 1 - Cos^2\theta$
   $-Cos^2\theta + 2Cos\theta + 1$
   $-[Cos^2\theta - 2Cos\theta - 1]$
   To determine the numerical value of the expression more information need to be supply or the expression must be equated to zero

5. $\tan(90 + x) = \frac{Sin(90+x)}{Cos(90+x)}$
   $= \frac{Sin90Cosx + Cos90Sinx}{Cos90Cosx - Sin90Sinx}$
   But $Sin90 = 1$ and $Cos90 = 0$

$$\tan(90 + x) = \frac{1 \times Cosx + 0 \times Sinx}{0 \times Cosx - 1 \times Sinx}$$

$$\tan(90 + x) = \frac{Cosx}{-Sinx} = -\frac{Cosx}{Sinx} = -cotx$$

$$\Rightarrow \tan(90 + x) = -Cotx \quad \textbf{Ans:A}$$

6. The diagram for the question was not given.

7. $\int udv = vu - \int vdu$

$$\Rightarrow u = x, \frac{du}{dx} = 1$$

$$\therefore du = dx$$

$$dv = e^x dx$$

$$v = e^x$$

$$\int xe^x dx = xe^x - \int e^x dx$$

$$= xe^x - e^x + c$$

$$= e^x(x - 1) + c \quad \textbf{Ans:D}$$

8. $A = \int_0^\pi sinxdx = [-cosx]_0^\pi = \quad [-cos\pi] - [-cos0] = 1 + 1 = \quad 2 square\ units$ **Ans: A**

9. **D**

10. **A**

11. $y = 2x + 1 \quad m_1 = 2$

Let the gradient of the require line be m_2.

$m_1 m_2 = -1$ for perpendicular lines

$$2m_2 = -1$$

$$m_2 = \frac{-1}{2}$$

$$y - y_1 = m_2(x - x_1), \quad y - 1 = m_2(x - 3)$$

$$y - 1 = \frac{-1}{2}(x - 3), \quad 2(y - 1) = -1(x - 3)$$

$$2y - 2 = -x + 3, \quad 2y = -x + 3 + 2, \quad 2y = -x + 5$$

$$y = \frac{-1}{2}x + \frac{5}{2} \quad \textbf{Ans: B}$$

12. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$$= \sqrt{(4 - 1)^2 + (5 - 2)^2}$$

$$= \sqrt{3^2 + 3^2}$$

$$= 3\sqrt{2}\ unit \quad \textbf{Ans: A}$$

13. $\int 2\tan(2x + \pi)\,dx$

$$= 2\int \tan(2x + \pi)\,dx$$

$$\tan(2x + \pi) = \frac{Sin(2x + \pi)}{Cos(2x + \pi)}$$

$$2\int \tan(2x + \pi)\,dx$$

$$= 2\int \frac{Sin(2x + \pi)}{Cos(2x + \pi)}dx$$

$$= -2\int \frac{-Sin(2x + \pi)}{Cos(2x + \pi)}dx$$

let $u = Cos(2x + \pi)$

$$\frac{du}{dx} = -2\,[Sin(2x + \pi)]$$

$$dx = \frac{1}{-2[Sin(2x + \pi)]}\,du$$

$$2\int \tan(2x + \pi)\,dx$$

$$= -2\int \frac{Sin(2x + \pi)}{-Cos(2x + \pi)}dx$$

$$= -2\int \frac{-Sin(2x + \pi)}{u}dx$$

$$= -2\int \frac{-Sin(2x + \pi)}{u} \times \frac{du}{-2Sin(2x + \pi)}$$

$$= -\int \frac{1}{u}du = -\ln u + c$$

$$-\ln[Cos(2x + \pi)] + c$$

$$\ln[Cos(2x + \pi)]^{-1} + c$$

$$\ln[Sec(2x + \pi)] + c \quad \textbf{Ans: C}$$

14. $-3x^2 + 2x + 5 = 0$

$$3x^2 - 2x - 5 = 0$$

$$x = -1\ or\ \frac{5}{3} \quad \textbf{Ans:B}$$

15. $\left(\frac{3}{4}\right)^x \left(\frac{2}{3}\right)^y = \frac{32}{27}$

But $\left(\frac{3}{4}\right)^x = \left(\frac{4}{3}\right)^{-x}$

$$\left(\frac{4}{3}\right)^{-x} \left(\frac{2}{3}\right)^y = \frac{32}{27}$$

$$\frac{2^{-2x}}{3^{-x}} \times \frac{2^y}{3^y} = \frac{32}{27}$$

$$\frac{2^{y-2x}}{3^{y-x}} = \frac{32}{27} = \frac{2^5}{3^3}$$

$$2^{y-2x} = 2^5, \quad y - 2x = 5$$

$$y = 5 + 2x \dots\dots\dots(1), \quad 3^{y-x} = 3^3$$

$$y - x = 3, \quad y = 3 + x \dots\dots\dots(2)$$

$$5 + 2x = 3 + x, \quad 2x - x = 3 - 5, \quad x = -2$$

$$y = 3 + x = 3 - 2, \quad y = 1$$

$$\Rightarrow 3y - 2x = 3(1) - 2(-2)$$

$$= 3 + 4 = 7 \quad \textbf{Ans:B}$$

16. $-1 < 5 - 2y$

$$-1 - 5 < -2y, \quad -6 < -2y, \quad -2y > -6$$

$$y < 3$$

$$5 - 2y \le 7, \quad -2y \le 7 - 5, \quad -2y \le 2, \quad y \ge -1$$

$$-1 \le y < 3$$

$$-1, 0, 1, 2, 3 \quad \textbf{Ans:A}$$

17. $x^2 - 5x + 6 = x^2 - 2ax + a^2 + b$

$$\Rightarrow -5x = -2ax$$

$$a = \frac{5}{2}$$

$$a^2 + b = 6$$

$$\left(\frac{5}{2}\right)^2 + b = 6$$

$$b = \frac{6}{1} - \frac{25}{4} = \frac{24 - 25}{4} = -\frac{1}{4} \quad \textbf{Ans: A}$$

18. By arranging in ascending order, we have 55, 60, 60, 60, 60, 65, 65, 65, 65, 65, 65, 70, 70, 70, 70, 75

Median $= \frac{65 + 65}{2} = \frac{130}{2} = 65$

Mode $= 65$

Median + mode $= 65 + 65 = 130$ **Ans: B**

19. Let the amount invested at 7% be ₦ the amount invested at 5% be ₦$(200,000 - x)$

$$I = \frac{PRT}{100}$$

$$I_1 = \frac{x \times 7 \times 1}{100} = 0.07x$$

$$I_2 = \frac{(200000 - x) \times 5 \times 1}{100}$$

$$= 0.05(200000 - x)$$

$$I = I_1 + I_2 = ₦11,600$$

$$11,600 = 0.07x + 0.05(200000 - x)$$

$$11,600 = 0.07x + 10,000 - 0.05x$$

$$11,600 - 10000 = 0.02x$$

$$1600 = 0.02x$$

$$x = \frac{1600}{0.02} = ₦80,000.00$$

$$200000 - x = 200,000 - 80,000 = ₦120,000$$

The amount invested at 7% is ₦80,000 and the amount invested at 5% is ₦120,000.00

Ans:C

20. Let the square root of $95 - 30\sqrt{10}$ be $\sqrt{m} - \sqrt{n}$.

$\sqrt{95 - 30\sqrt{10}} = \sqrt{M} - \sqrt{n}$

I square both side

$95 - 30\sqrt{10} = \left(\sqrt{M} - \sqrt{n}\right)^2$

$= m + n + 2\sqrt{mm}$

$m + n = 95$

$m = 95 - n \ldots\ldots\ldots\ldots\ldots\ldots (1)$

$-2\sqrt{mn} = -30\sqrt{10}$

$\sqrt{mn} = 15\sqrt{10}$

$\left(\sqrt{mn}\right)^2 = \left(15\sqrt{10}\right)^2$

$mn = 225(10)$

$mn = 2250 \ldots\ldots\ldots\ldots\ldots. (2)$

$(95 - n)n = 2250$

$95n - n^2 = 2250$

$n^2 - 95n + 2250 = 0$

$n = 50 \, or \, 45$

When $n = 50, m = 45$

When $n = 45, m = 50$

When $m = 45, n = 50$

$\sqrt{m} - \sqrt{n} = \sqrt{45} - \sqrt{50}$

$= 3\sqrt{5} - 5\sqrt{2}$

$3\sqrt{5} - 5\sqrt{2} \equiv a\sqrt{5} + b\sqrt{2}$

$a = 3 \, and \, b = -5$

$(a, b) = (3, -5)$ **Ans:D**

21. $\frac{x}{y} = c \implies x = yc \ldots\ldots\ldots\ldots\ldots. (1)$

$\frac{z}{w} = c \implies z = wc \ldots\ldots\ldots\ldots\ldots (2)$

$\frac{x}{y} = \frac{z}{w} = c$

$\frac{x}{z} = \frac{y}{w} = c \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$

$\frac{3x^2 - xz + z^2}{3y^2 - yz + w^2} = \frac{z^2\left[3\left(\frac{x}{z}\right)^2 - \left(\frac{x}{z}\right) + 1\right]}{w^2\left[3\left(\frac{y}{w}\right)^2 - \left(\frac{y}{w}\right) + 1\right]}$

$= \left(\frac{z}{w}\right)^2 \times \frac{\left[3\left(\frac{x}{z}\right)^2 - \left(\frac{x}{z}\right) + 1\right]}{\left[3\left(\frac{y}{w}\right)^2 - \left(\frac{y}{w}\right) + 1\right]}$

$= c^2 \times \frac{[3(c^2) - c + 1]}{3(c^2) - c + 1}$

$c^2 \times \frac{(3c^2 - c + 1)}{(3c^2 - c + 1)} = c^2$ **Ans: D**

22. $\frac{5y - 12}{(y-2)y-3} \equiv \frac{A}{y-2} + \frac{B}{y-3}$

$\equiv \frac{A(y-3) + B(y-2)}{(y-2)(y-3)}$

$5y - 12 = A(y-3) + B(y-2)$

Let $y = 3$

$5(3) - 12 = B(3-2)$

$15 - 12 = B = 3$

Let $y = 2$

$5(2)12 = A(2-2)$

$10 - 12 = -A$

$-2 = -A$

$A = 2$

$\frac{5y - 12}{(y-2)(y-3)} = \frac{2}{y-2} + \frac{3}{y-3}$ **Ans: B**

23. $r = \left[\frac{Un}{Um}\right]^{\frac{1}{n-m}} = \left[\frac{\frac{1}{4}}{-\frac{1}{2}}\right]^{\frac{1}{3-2}} = \left[-\frac{1}{2}\right]^1 = -\frac{1}{2}$

$r = -\frac{1}{2}$

$T_2 = ar = -\frac{1}{2}$

$a\left(-\frac{1}{2}\right) = -\frac{1}{2}$

$a = 1$

$S_\infty = \frac{a}{1-r} = \frac{1}{1+\frac{1}{2}} = \frac{1}{\frac{3}{2}} = \frac{2}{3}$ **Ans: D**

24. $< ADB = 55^0$ angle subtended in an alternate segment

$< ADB = ABD = 55^0$ angle subtended by tangent draw from a common point.

$< BAD + < ADB + < ABD = 180$

$< BAD + 55 + 55 = 180$

$< BAD + 55 + 55 = 180$

$< BAD = 180 - 110$

$< BAD = 70^o$ **Ans:B**

25 Incomplete question

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2009 POST-UTME SCREENING EXERCISE POST UME 2009 MATHEMATICS

1. Factorize $6x^2 - 14x - 12$
   (a) $2(x + 3)(3x - 2)$ (b) $6(x - 2)(x + 1)$ (c) $2(x - 3)(3x + 2)$ (d) $6(x + 2)(x - 1)$ (e) $(3x + 4)(2x + 3)$

2. What is the product of $\frac{27}{5} \div (3)^3$ and $\left(\frac{1}{5}\right)$
   (a) 5 (b) 3 (c) 2 (d) 1 (e) $\frac{1}{25}$

3. If the length of the sides of a right-angled triangle are $(3x + 1)cm, (3x - 1)cm$ and xcm, what is x?
   (a) 2 (b) 6 (c) 18 (d) 12
   (e) 0

4. Evaluate $\frac{(xy^2 - x^2y)}{(x^2 - xy)}$ (a) 3 (b) $\frac{3}{5}$
   (c) $\frac{4}{5}$ (d) 3 (e) 4

5. Two fair dice are rolled. What is the probability that both show up the same number of point?
   (a) $\frac{1}{36}$ (b) $\frac{7}{36}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$ (e) $\frac{1}{6}$

6. In 1984, Tolu was 24 years old and is father 45 years. In what year was Tolu exactly half his father's age? (a) 1982 (b) 1981
   (c) 1983 (d) 1979 (e) 1978

7. Find the probability that a number selected at random from 40 to 50 is a prime
   (a) $\frac{3}{11}$ (b) $\frac{5}{11}$ (c) $\frac{5}{10}$ (d) $\frac{4}{10}$ (e) $\frac{7}{12}$

8. A man kept 6 black, 5 brown and 7 purple shirts in a drawer. What is probability of him picking a purple shirt with his eyes closed (a) $\frac{1}{7}$ (b) $\frac{7}{18}$
   (c) $\frac{11}{18}$ (d) $\frac{7}{11}$ (e) 6. $\frac{5}{10}$

9. An $(n - 2)^2$ sided figure has n diagonals, find the number n of diagonals for a 25 sided figure (a) 8 (b) 7 (c) 6 (d) 9 (e) 10.

10. Find the probability of selecting a figure which is parallelogram from a square, a rectangle, a

rhombus, a kite and a trapezium (a) $\frac{5}{5}$ (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{5}$ (e) $\frac{5}{6}$

11. If P varies inversely as V and V varies directly as R², find the relationship between P and R given that R = 7 when P = 2 (a) $P = 98R^2$ (b) $PR^2 = 98$ (c) $P^2R = 89$ (d) $P = \frac{1}{98R}$ (e) $P = \frac{R^2}{98}$

12. If 7 and 189 are the first and fourth terms of a geometric progression respectively find the sum for the first three terms of the progression (a) 182 (b) 180 (c) 91 (d) 63 (e) 28

13. Find the positive number n such that thrice its square is equal to twelve times the number (a) 1 (b) 4 (c) 2 (d) 5 (e) 9

14. A sector of a circle of radius 7.2cm which subtends an angle of 300° at the centre is used to form a cone. What is the radius of the base of the cone? (a) 6cm (b) 7cm (c) 8cm (d) 9cm (e) 5cm.

15. If $pq + 1 = q^2$ and $t = \frac{1}{p} - \frac{1}{pq}$ express t in terms of q (a) $\frac{1}{pq}$ (b) $\frac{1}{q+1}$ (c) $\frac{1}{q+2}$ (d) $\frac{1}{p+2}$ (e) $\frac{1}{1-q}$

16. Given a regular hexagon, calculate each interior angle of the hexagon (a) 60° (b) 30° (c) 120° (d) 45° (e) 135°

17. Find n if $Log_2 4 + Log_2 Z\ Log_2 n = -1$ (a) 10 (b) 14 (c) 12 (d) 27 (e) 26

18. If $x = 1$ is root of the equation $x^3 - 2x^2 - 5x + 6$, find the other roots (a) -3 and 2 (b) 2 and 2 (c) 3 and -2 (d) 1 and 3 (e) -3 and 1

19. The value of $(0.303)^3 - (0.02)^3$ is (a) 0.019 (b) 0.0019 (c) 0.00019 (d) 0.000019 (e) 000035

20. List all integers satisfying the inequality $-2 < 2x - 6 < 4$ (a) 2, 3, 4, 5 (b) 2, 3, 4 (c) 2, 5 (d) 3, 4, 5 (e) 4, 5

21. If $3^{2y} - 6(3^y) - 27$ find y (a) 3 (b) 1 (c) 2 (d) -3 (e) 1

22. A number of pencils were shared out among Peter, Paul and Audu in the ratio 2:3:5 respectively. If Peter got 5, how many were shared? (a) 15 (b) 25 (c) 30 (d) 50 (e) 55

23. A sum of money was invested at 8% per annum sample interest. If after 4 years the money became N330.00, what is the amount originally invested? (a) ₦180 (b) ₦165.00 (c) ₦150 (d) ₦200 (e) ₦250

SOLUTION TO 2009 POST-UTME

1. $6x^2-14x-12$
   $2(3x^2 - 7x - 6)$
   $2(x-3)(3x + 2)$ **Ans:C**

2. $\frac{27}{5} \div (3)^3 = \frac{27}{5} \div \frac{27}{1} = \frac{27}{5} X \frac{1}{27} = \frac{1}{5}$
   $= \left(\frac{27}{5} \div 3^3\right)\left(\frac{1}{5}\right) = \frac{1}{5} X \frac{1}{5} = \frac{1}{25}$ **Ans:E**

3. By Pythagoras theorem
   $hyp^2 = opp^2 + adj^2$
   $(3x + 1)^2 = (3x -1)^2 + x^2$
   $x^2 - 12x = 0$, $x(x - 12) = 0$, $x \neq 0$
   $x-12= 0$, $x = 12$ **Ans: D**

4. $\frac{xy^2 - x^2y}{x^2 - xy} = \frac{xy(y-x)}{x(x-y)}$ **No correct option**

5. The event space (E) = {1, 1; 2, 2;3, 3; 4, 4; 5, 5;6. 6}
   $Probability = \frac{Event\ Space}{Sample\ Space}$ $= \frac{6}{36} = \frac{1}{6}$ **Ans: E**

6. Let Tolu's age be equal to half of her father's age in x-years time from 1984.
   But in years time Tolu's age 24 + x
   Father's age = 45 + x
   Since Tolu's age must be half of her father's age in x year time then
   24 + x =1/2(45 + x)
   2(24 + x) = 45 + x
   48 + 2x = 45 + x
   2x - x = 45 - 48
   x = -3 **Ans:B**

7. Samples space(s)
   = {40,41,42,43,44,45,46,47,48,49,50}
   Event space (E) = {41,43,47}
   Probability $= \frac{Event\ Space}{Sample\ Space} = \frac{3}{11}$ **Ans: A**

8. Sample space (S) = {6 black, 5brown, 7pupils}
   Event space (E) = {7 purple}
   Probability $= \frac{Event\ Space}{Sample\ Space} = \frac{7}{18}$ **Ans:B**

9. If the number of sides = 25 = $(n-2)^2 = 25$
   n - 2 = $\sqrt{25}$
   n = 5 + 2
   n = 7 **Ans:B**

10. Types of parallelogram includes: squares, rectangles, rhombus and kite are all special
    Therefore, Event space = {square, rectangle, rhombus, kite}
    Sample space = {square, rectangle, rhombus, kite, trapezium}
    Probability $= \frac{Event\ Space}{Sample\ Space} = \frac{4}{5}$ **Ans: C**

11. $P\ \alpha\ \frac{1}{v}$ and $V\ \alpha\ R^2$
    $= P\ \alpha\ \frac{1}{R^2}$
    =If R = 7 and P = 2
    $= 2 = \frac{k}{7^2}$
    K = 98
    $P = \frac{k}{R^2} = P = \frac{98}{R^2}$
    PR² = 98 **Ans:B**

12. $T_1=a = 7$
    $T_4 =ar^3 = 189$
    $\frac{ar^3}{a} = \frac{189}{7}$
    $r^3 = 27 = r^3 = 3^3 = 3$, $T_1 + T_2 + T_3 = a + ar + ar^2$
    7 + 7 X 3 + 7 X 3²
    7 + 21 + 63 = 91 **Ans:C**

13. Since the number is n
    The squares of the number = n²
    Three times the square of the number-3n²
    Twelve times the number = 12n
    Since thrice times the Square of the number is equal to twelve time the number
    3n² = 12n
    3n² - 12n = 0
    n(3n- 12) = 0
    3n = 12 .
    n = 4 **Ans: B**

14, r = $\frac{\theta}{360}$ X L

Where Q is the angle subtended by the sector L = 7.2cm, $\theta = 300°$

r = $\frac{300}{360} X\ 7.2$

r = 6cm **Ans: A**

15. t = $\frac{1}{p} - \frac{1}{pq} = \frac{q-1}{pq}$

p = $\frac{q-1}{qt}$ … … … … … … … (i)

But $pq + 1 = q^2$ …..(ii)

Put equation (i) into (ii)

$\left(\frac{q-1}{qt}\right)q + 1 = q^2$

$\left(\frac{q-1}{t}\right) + 1 = q^2$

$\left(\frac{q-1}{t}\right) = q^2 - 1$

$\left(\frac{q-1}{t}\right)(q-1)(q+1)$

$(q-1) = t\ (q-1)(q+1)$

$\frac{(q-1)}{(q-1)(q+1)} = t$

$t = \frac{1}{q+1}$ **Ans:B**

16. Each interior angle of a polygon

$= \frac{(n-2)\ x\ 180n}{n}$

for haxagon $n = 6$

$\frac{(6-2)\ x\ 180}{6} = \frac{4\ X\ 180}{6} = \frac{720}{6} = 120$ **Ans: C**

17. Question not clear

18. Since $x \sim 1$ then $x - 1$ is a factor of

$x^3 - 2x^2 - 5x + 6$

$x^2 - x - 6$

$\overset{x-1}{\sqrt{x^3 - 2x^2 - 5x + 6}}$,

$\underline{(-)x^3 - x^2}$

$-x^2 - 5x$

$\underline{(-)-x^2 + x}$

$-6x + 6$

$\underline{(-) - 6x + 6}$

$\qquad 0\quad 0$

$x^2 - x - 6 = (x-3)(x+2) = 0$

$x - 3 = 0\ or\ x + 2 = 0$

$x = 3\ or\ -2$ ***Ans: C***

19. $(0.303)^3 - (0.02)^3$

But $x^3 - y^3 = (x-y)(x^2 + xy + y^2)$

Let x = 0.303 and y = 0.02

$(0.303)^2 - (0.02)^3$

$= (0.303 - 0.02)(0.303^2 + 0.303\ x\ 0.02 + 0.02^2)$

$= (0.283)(0.091B + 0.0061 + 0.0004) = 0.0278$

No correct option

20. $-2 < 2x - 6 < 4$

$-2 < 2x - 6$

$-2 + 6 < 2x$

$4 < 2x\ = 2 < x = x > 2$

$2x - 6 < 4$

$2x < 4 + 6$

$= 2\ x < 10 = x < 5$

$2 < x < 5$

x - 3,4 **No correct option**

21. $3^{2y} - 6(3^y) - 27 = 0$

$(3^y)^2 - 6(3^y) - 27 = 0$

Let $p = 3^y$

$P^2 - 6p - 27 = 0$

$P^2 - 9\ or\ - 3$.

p = 9,

But p = 3^y,

9 = 3^y,

$3^2 = 3^y$, y = 2 **Ans:C**

22. $Pe: Pa: Au = 2:3:5$

$\frac{P^2}{2} = \frac{Pa}{3} = \frac{Au}{5} = k$

Pe = $2k$

Pa = $3k$

Au = $5k$

Since Peter (Pe) got 5 pencils

$Pe = 2k$

$5 = 2k$

$K = \frac{5}{2}$

$Pe = 5$

Pa = 3k = 3 X $\frac{5}{2} = \frac{15}{2}$

Au = 5k = 5 X $\frac{5}{2} = \frac{25}{2}$

Au = 5k = 5 X $\frac{5}{2} = \frac{25}{2}$

$\frac{10+15+25}{2} = \frac{50}{2} = 25$

Total pencils share = 25 **Ans: B**

23. A = P $\left(1 + \frac{PT}{100}\right)$

P = 7 T = 4

$R = 8\%$ $A = 330$

330 = P (1.32)

P = $\frac{330}{1.32} = 250$

24. The original amount invested = N250.00 **Ans: E**

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2008 POST-UME SCREENING
EXERCISE - MATHEMATICS

1. The expression $a^3 + b^3$ is equal to A. $(a^2 + b)(a - ab + b^2)$ B. $a + ba^2 - ab + b^2$ C. $a - b^2 a^2 - ab + b$ D. $(a - b)(a^2 + ab + b^2)$

2. Factorize $16(3x + 2y)^2 - 25(a + 2b)^2$ A. $(12x + 8y + 5a + 10b(12 + 8y - 5a - 10b)$ B. $20\ (3x + 2y - a - 10b)(12x + 8y - 5a - 10b)$ D. $20(3x + 2y + a + 2b)(3x + 2y + a + 2b)$

3. A cone has base radius 4cm and height 3cm. The area of its curved surface is A. $12\pi cm^2$ B $20\pi cm^2$ C. $24\pi cm^2$ D. $251\pi cm^2$

4. A cylinder has height 4cm and base radius 5cm. Its volume to 3significant figure is A. $314.2 cm^2$ B. $31.42 cm^2$ C. $251.4 cm^2$ D. $251 cm^2$

5. Let $\log y + \log x^3 = 3.$ Then y is A. $\left(\frac{x}{10}\right)^3$ B. $\left(\frac{x}{10}\right)^{-3}$ C. $\left(\frac{10}{x}\right)^{-1/3}$ D. $\frac{10^3}{x}$

6. If $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1,$ then y is A. $\pm \frac{b}{a}\sqrt{a^2 - x^2}$ B. $\pm \frac{b}{a}\sqrt{x^2 - a^2}$ C. $\frac{a}{b}\sqrt{a^2 - x^2}$ D. $\pm \frac{a}{b}\sqrt{x^2 - a^2}$

7. A cyclist rode for 30 minutes at xkm/hr and due to a breakdown he had to push the bike for 2 hirs at $x - 5$ km/hr. If the total distance covered is the range of values for x? A. x<14 B. X<29 C. X<28 D. x<20

8. The expression $ax^2 + bx$ takes the value 6 when x = 1 and 10 when x = 2. Find its value when x = 5 A. 10 B. 12 C. 6 D. -10

9. Dividing $2x^3 - x^2 - 5x + 1$ by $x + 3$ gives the remainder A. -3 B. 47 C. 61 D. -47

10. Let $f(x) = 2x^3 - 3x^2 - 5x + 6$. If $x - 1$ divides $f(x)$ find the poles of the function A. $1, 2, \frac{3}{2}$ B. $1, 2, -\frac{3}{2}$ C. $-1, 2, 3$ D. $1, -2, -\frac{3}{2}$

11. The difference of two numbers is 10, while their product is 39. Find these numbers. A.-3 and 10 or 13 and 10, B. 3 and -10 or 3 and 13. C.3 and -3 or 3 and 13, D. -3 and 13 or 13 and 3

12. The average age of pupils in a class is 14 years, 2 months. A pupil of 15 years 2 month joins the class and the average age is increased by one month. Find x. A.12 B.6 C.11 D.14

All the 120 pupils in a school learn Yoruba or Igbo or both. Given that 75 learn Yoruba and 60 learn Igbo

13. How many learn both languages? A.60 B. 45 C.15 D.120

14. How many learn Igbo only? A. 45 B. 30 C.15 D.60

Suppose we have matrices
A = $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 0 & 2 \\ 4 & 3 \end{pmatrix}$

15. Find $A^2 + AB - 2A$
A. $\begin{pmatrix} 5 & -9 \\ 12 & 14 \end{pmatrix}$ B. $\begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix}$
C. $\begin{pmatrix} -4 & -4 \\ 12 & 13 \end{pmatrix}$ D. $\begin{pmatrix} 0 & -4 \\ -8 & -6 \end{pmatrix}$

16. Evaluate the integral $\int_1^2 \left(x^2 + \frac{1}{x}\right) dx$ A.$\frac{8}{3} + \ln 2$ B.$\frac{7}{3} + \ln 2$ C.$\frac{7}{3} - \ln 2$ D.$\frac{8}{3}$

17. If the distance covered by a body in time t seconds is s = $t^3 - 6t^2 + 5t$, what is its initial velocity? A. $0ms^{-1}$ B.$-4ms^{-1}$ C.$(3t^2 - 12t + 5)ms^{-1}$ D.$5ms^{-1}$

Suppose D, E and P are subsets of a universal set U. Let U be the set of natural numbers not greater than 10, while D, E and P are respectively the set of odd numbers, even number and prime number. For any set X, its complement is denoted by X'and ∅ denote the empty set

18. Display the set D' ∩ P A. {3,5,7} B.{2} C. {4,6,8,10} D. {2,3,5,7}

19. Find D ∩ E A. {2} B. {3,5} C. {1,2,3,4,5,6,7,8,9,10} D. ∅

20. The trigonometric expression cos 2A + sin 2A can be written as A.cosA(cos A – sinA) B. $\cos^2 A + \sin^2 A - 2\sin A \cos A$ C.2 sin A cos A + $\cos^2 A$ D. $\cos^2 A + \sin^2 A - 2\sin A \cos A$

A bag contains 10 balls of which 3 are red and 7 are white. Two balls are drawn at random. Find the probability of none of the balls is red if the draw is

21. With replacement: A. 0.9 B.1 C. 0.4 D. 0.49

22. Without replacement: A. 0.1 B.0.47 D. 0.42 D.0.21

23. In a throw of a fair die the probability of obtaining an even number is A. 1 B. $\frac{2}{3}$ C. $\frac{1}{2}$ D. $\frac{2}{3}$

24. Two fair coins are tossed simultaneously. What is the probability of obtaining at least 1 tail turns up? A.$\frac{1}{4}$ B.$\frac{3}{4}$ C.$\frac{1}{2}$ D. 1

25. Find the value of $\frac{1}{\alpha} - \frac{1}{\beta}$
A. $\pm\frac{4}{3}$ B.$\frac{3}{4}$ C.$\pm\frac{3}{4}$ D.$\frac{1}{5}$

26. A regular polygon has each of the polygon? A.18 B. 36 C.9 D.20

27. One angle of an octagon is 100° while the other sides are equal. Find each of these exterior angles A.80° B.60° C.140° D.40°

SOLUTION TO 2008 POST UTME SCREENING

1. $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$
   $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$ **Ans:B**

2. $16(3x + 2y)^2 - 5^2(a + 2b)^2$
   $= 4^2(3x + 2y)^2 - 5^2(a + 2b)^2$
   $= [4(3x + 2y)]^2 - [5(a + 2b)]^2$
   But $a^2 - b^2 = (a + b)(a - b)$
   $= [4(3x + 2y) + 5(a + 2b)][4(3x + 2y) - 5(a + 2b)][4(3x + 2y) - 5(a + 2b)]$
   $= [12x + 8y + 5a + 10b][12x + 8y - 5a - 10b]$ **Ans:A**

3. r = 4cm, h = 3m
   ΔOBC *is a right angle triangle. Let /BC/ = L (the slant height)*
   $L^2 = 3^2 + 4^2$
   $L^2 = 9 + 16 = 25$
   $L = \sqrt{25} = 5cm$
   Curve surface area of a cone = $\pi rL = \pi \times 4 \times 5 = 20\pi cm^2$ **Ans: B**

4. Volume of a cylinder = $\pi r^2 h = \pi \times 5^2 \times 4 = 100\pi = 314.15 cm^2$ **Ans: A**

5. Log$y$ + log3 = 3
   Whenever a logarithm is written without a base, the base is 10
   $\Rightarrow Log_{10}^y + Log_{10}^{x^3} = 3$
   But $Log_{10}^{1000} = 3$ $\Rightarrow Log_{10}^y + Log_{10}^{x^3} = Log_{10}^{1000}$
   $Log_{10}^{yx^3} = Log_{10}^{1000}$
   $yx^3 = 1000$
   $y = \frac{1000}{x^3} = \left(\frac{10}{x}\right)^3$ **Ans: D**

6. $\frac{x^2}{a^2} - \frac{x^2}{a^2} = 1$
   $= \frac{x^2}{a^2} - 1 = \frac{y^2}{b^2}$ $\Rightarrow = \frac{x^2 - a^2}{a^2} = \frac{y^2}{b^2}$
   $y^2 = \frac{b^2(x^2 - a^2)}{a^2}$
   $\Rightarrow y = \pm\sqrt{\frac{b^2(x^2 - a^2)}{a^2}}$
   $y = \frac{\pm b\sqrt{x^2 - a^2}}{a}$ $\Rightarrow y = \frac{\pm b}{a}\sqrt{x^2 - a^2}$ **Ans: B**

7. Let the distance covered in the first 30mins (0.5hr) be d1 and distance in the 2hrs be d2.
   $x = \frac{d_1}{t_1}$
   $d_1 = xt_1 = 0.5x \ldots\ldots\ldots\ldots\ldots (1)$
   $x - 5 = \frac{d_2}{2}$
   $d_2 = 2(x - 5) \ldots\ldots\ldots\ldots\ldots\ldots (2)$
   d = $d_1 + d_2 = 0.5x + 2(x - 5)$
   $= 0.5x + 2x - 10$
   d = 2.5x - 10
   But d < 60

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$\Rightarrow 2.5x < 60 + 10$

2.5x < 60 + 10

2.5x < 70

$x < \frac{70}{2.5}$ or $x < 28$ **Ans: C**

8. When x = 1, ax² + bx = 6

a + b = 6

a = 6 – b....................(1)

When x = 2, ax² + bx = 10

4a + 2b = 10................(2)

Subtitute equation 1 into 2

4(6 – b) + 2b = 10

24 – 4b + 2b = 10

-2b = 10 – 24

-2b = -14

b = 7

a = 6 – 7 = -1

When x = 5

ax² + bx = -1(5)² + 7(5)

= -25 + 35 = 10 **Ans: A**

9. f(x) = 2x² – x² – 5x + 1

Let x + 3 = 0

x = -3

f(-3) = 2(-3)² – (-3)² – 5(-3) + 1

= 2(-27) – (9) + 15 + 1

f(-3) = -54 – 9 + 16 = -47

Ans: D

10.

```
            2x² - 3x - 6
       _____
x - 1 | 2x³ - 3x² - 5x + 6
        (-)2x³ - 2x²
        _____
            -x² - 5x
            (-) - x² + x
            _____
                -6x + 6
                (-1) - 6x - 6
                _____
                    0   0
```

$\Rightarrow 2x^3 - 3x^2 - 5x + 6$

= (x – 1)(2x² – x – 6)

= (x – 1)(x – 2)(2x + 3)

To obtain the pole of the equation, equate the equation to zero

(x – 1)(x – 2)(2x + 3) = 0

x = 1, 2 or $-\frac{3}{2}$ **Ans: B**

11. Let the number be x & y such that x & y

x – y = 10

x = 10 + y.......................(1)

xy = 39..........................(2)

(10 + y)y = 39 = 0

y2 + 10y – 39 = 10

y = 3 or -13

x = 10 + y

When y = 3

x = 13

When y = - 13

x = 10 – 13

x = -3

$\Rightarrow x = 3$ or $- 3$ and $y = 3$ or $- 13$

The number is 13 and 3 or -3 and -13 **Ans: D**

12. $\bar{x} = \frac{\varepsilon x}{n}$

14yrs 2months $= \frac{\varepsilon x}{n}$

But 14yrs 2months

$= 14yrs + \frac{2}{12}yrs = 14.1667yrs$

14.1667yrs $= \frac{\varepsilon x}{x}$

$\varepsilon x = 14.1667x$

15yrs 2months $= 15yrs + \frac{2}{12}yrs = 15.1667yrs$

If a pupil of 15yrs 2months join the class, the total age of the people in the class is given by

$\varepsilon x = 14.1667x + 15.1667yrs$

Since the average age increase by one month, the new average age is 14yrs 3 months (14.25yrs). Since one person is added to the class, the number of pupils in the class now is x + 1

$\Rightarrow 14.25 = \frac{14.1667+15.1667}{x+1}$

14.25(x + 1) = 14.1667x + 15.1667

14.25x + 14.25 = 14.1667x + 15.1667

14.25x – 14.1667x = 15.1667 – 14.25

0.0833x = 0.9167

$x = \frac{0.9167}{0.0833} = 11.0048$

x = 11 **Ans: C**

13. $n(\mu) = 120$, $n(Y) = 75$, $n(I) = 60$

$letn(YnI) = x$

$n(Y)$ only $= 75 - x$ $n(I)only = 60 - x$
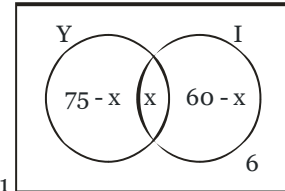
120 = 135 – x

120 – 135 – x

-15 = -x

x = 15 **Ans: C**

14. $n(I)only = 60 - x = 60 - 15 = 45$

Ans: A

15. $A^2 = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix}$

$AB = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} 0 & 2 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} -4 & -1 \\ 12 & 13 \end{bmatrix}$

$2A = 2\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} 2 & -2 \\ 4 & 6 \end{bmatrix}$

$A^2 + AB - 2A = \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix} + \begin{bmatrix} -4 & -1 \\ 12 & 13 \end{bmatrix} -$

$\begin{bmatrix} 2 & -2 \\ 4 & 6 \end{bmatrix} = \begin{bmatrix} -7 & -3 \\ 16 & 14 \end{bmatrix}$ **None of the option is correct**

16. $\int_1^2 \left(x^2 + \frac{1}{x}\right) dx$

$\left[\frac{x^3}{3} + Inx\right] = \left[\frac{2^3}{3} + In2\right] - \left[\frac{1^3}{3} + In1\right] = \left[\frac{8}{3} + In2\right] - \left[\frac{1}{3} + In1\right]$

But in 1 = 0

$= \left[\frac{8}{3} + In2\right] - \left[\frac{1}{3} + 0\right] = \frac{8}{3} - \frac{1}{3} + In2 = \frac{7}{3} + In2$

Ans: B

17. S = t³ – 6t² + 5t

First obtain the velocity function

$\frac{ds}{dt} = \frac{d}{dt}(t^3 - 6t^2 + 5t)$

v = 3t³ – 12t + 5

Initial velocity occur at t = 0

v = 3(0)2 – 12(0) + 5

v = 5mls **Ans: D**

18. $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$D = \{2, 4, 6, 8, 10\}$

$P = \{2, 3, 5, 7\}$

$D' = \{2, 4, 6, 8, 10\}$
$D' \cap P = \{2\}$ **Ans: B**

19. $D \cap E = \emptyset$ **Ans: D**

20. $Cos2A = cos^2A - sin^2A$
$Sin2A = 2sinA\,cosA$
$Cos2A + Sin2A$
$= cos^2A - sin^2A + 2sinAcosA$ **Ans: none of the option is correct**

21. Since none of the two ball pick is red, then they are both white
$Pr(W) = \frac{7}{10} x \frac{7}{10} = \frac{49}{100} = 0.49$ **Ans: D**

22. If the pick is without replacement
$Pr(W) = \frac{7}{10} x \frac{6}{9} = \frac{14}{30} = 0.47$ **Ans: B**

23. The faces of a fair dice contain the number 1, 2, 3, 4, 5, 6
$pr(\text{even number}) = \frac{3}{6} = \frac{1}{2}$ **Ans: C**

24. $Sample\ Space(S) = \{HH, HT, TT, TH\}$
$Event\ Space(S) = \{HT, TT, TH\}$
Let the event of at least one tail be K
$Pr(K) = \frac{Event\ space}{Sample\ space} = \frac{3}{4}$ **Ans: B**

25. $x2 - 5x + 4 = 0$
$a = 1 \quad b = -5 \quad c = 4$
$\alpha\beta = \frac{c}{a} = 4$
$\alpha - \beta = \sqrt{(\alpha + \beta)^2 - 4\alpha\beta}$
$\alpha - \beta = \sqrt{5^2 - 4(4)}$
$\sqrt{25 - 16} = \sqrt{9} = \pm 3$
$\frac{1}{\alpha} - \frac{1}{\beta} = \frac{\beta - \alpha}{\alpha\beta} = \frac{-(\alpha - \beta)}{\alpha\beta} = \frac{-(\pm 3)}{4}$
$\pm \frac{3}{4}$ **Ans: C**

26. Each interior angle of a polygon is equal to $\frac{(n-2)180}{n}$
$$\Rightarrow 160 = \frac{(n-2)180}{n}$$
$160n = 180n - 360$
$160n = 180n = -360$
$-20n = -360$
$n = \frac{360}{-20} = 18$ **Ans: A**

27. The sum of the interior angle of a polygon = (n – 2) x 180 for octagon n = 8
$\Rightarrow The\ sum\ of\ interior\ of\ the\ pentagon$
$= (8 - 2) \times 180 \quad = 6 \times 180 = 1080$
Let each of the remaining 7 angles be x
$100 + 7x = 1080$
$7x = 1080 - 100$
$7 = 980$
$x = \frac{980}{7} = 140^0$
Interior angle + exterior angle = 180 (Angles on a straight line)
140 + Exterior angle = 180
Exterior angle = 180 – 140
Exterior cycle = 40º.

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, NIGERIA 2007 POST-UME SCREENING EXERCISE - MATHEMATICS

1. The interior angles of a pentagon are: 180º, 118º, 78º ,84ºand x. the value of x is:
(a) 75º (b) 108º (c) 120º (d) 134º

2. All vertices of an isosceles triangle lie on a circle and each of the base angles of the triangle is 65º. The angle subtended at the centre of the circle by the base of the triangle is: (a) 130º (b) 115º (c) 100º (d) 65º

3. A square tile measures 20cm by 20cm. How many of such files will cover a floor measuring 5m by 4m? (a) 500 (b) 400 (c) 320 (d) 250

4. The volume of a certain sphere in numerically equal to twice its surface area. The diameter of the sphere is: (a) 6 (b) 9 (c) 12 (d) $\sqrt 6$

5. A bearing of 310º, expressed as a compass bearing is: (a) N50ºW (b) N40ºW (c) S40ºW (d) S50ºW

6. Which of the following specified sets of data is <u>not necessarily</u> sufficient for the construction of a triangle? (a) three angles (b) two sides and aright angle (c) two sides and an included angle (d) three sides

7. The average age of the three children in a family is 9 years. If the average age of their parent is 39 years, the average age of the whole family is: (a) 20 years (b) 21 years (c) 24 years (d) 27 years.

8. Simplify $1 + \frac{2}{3} - 3 \div \left(1 + \frac{2}{3} of \frac{6}{7}\right)$ (a) $-\frac{8}{33}$ (b) $\frac{21}{11}$ (c) $\frac{33}{21}$ (d) $-\frac{21}{8}$

9. If $1 + \frac{1}{1+\frac{1}{1+\frac{1}{x}}} = 5$, find x
(a) $\frac{3}{7}$ (b) $\frac{7}{3}$ (c) $-\frac{3}{7}$ (d) $-\frac{7}{3}$

10. Evaluate x in base 3 if $41_x - 22_x = 17_x$ (a) 11 (b) 8 (c) 12 (d) 22

11. A woman buys 4 bags of rice for ⊾56 per bag and 3 bags of beans for ⊾26 per bag using the currency "LONI" (⊾) in base 7. What is the total cost of the items in another currency "MONI" (₦) in base 8? (a) M224 (b) M114 (c) M340 (d) M440

12. When the price of egg was raised by ₦2 an egg, the number of eggs which can be bought for ₦120 is reduced by 5. The present price of an egg is (a) ₦6 (b) ₦7 (c) ₦8 (d) ₦10

13. How long will it take a sum of money invested at 8% simple interest to double the original sum? (a) 8years (b) 10.5years (c) 12years (d) 12.5years

14. The journey from Lagos to Ibadan usually takes a motorist 1 hour 30 minutes. By increasing his average speed by 20km/hr, the motorist saves 15 minutes. His usual speed, in km/hr is
(a) 100 (b) 90 (c) 85 (d) 80

15. The smallest section of a rod which can be cut into exactly equal sections, each of either 30cm or 36cm in length is (a) 90cm (b) 180cm (c) 360cm (d) 540cm

16. If $x = 0.0012 + 0.00074 + 0.003174$, what is the difference between x to 2 decimal places and x to 1 significant figure? (a) 0.01 (b) 0.0051 (c) 0.1 (d) 0.005

17. The angle of depression of two points A and B on a place field from the top of a mast erected between A and B are 30º and 45º respectively. If A is westward of B, find /AB/ if the height of the mast is 15m from the field. (a) $15\sqrt 3 m$ (b)

$5(3 + \sqrt{3}m)$ (c) $15(1 + \sqrt{3})m$ (d) $15(\sqrt{3} - 1)$

18. The radius of a circle is given as 10cm subject to an error of 0.2cm. The error in the area of the circle is (a) $\frac{1}{4}$% (b) $\frac{1}{50}$% (c) 2% (d) 4%

19. If θ is acute, evaluate $\frac{\cos(90-\theta)+\sin(180-\theta)}{\cos(180-\theta)-\sin(90-\theta)}$ (a) $\tan\theta$ (b) $-\tan\theta$ (c) $\cot\theta$ (d) $-\cot\theta$

20. In a survey of 100 students in an institution, 80 students speak Yoruba, 22 speak Igbo, while 6 speak neither Igbo nor Yoruba. How many students speak Yoruba and Igbo?
(a) 96   (b) 8   (c) 64   (d) 12

21. A bag contains 5 yellow balls, 6 green balls and 9 black balls. A ball is drawn from the bag. What is the probability that it is a black or yellow ball?
(a) $\frac{37}{160}$ (b) $\frac{133}{400}$ (c) $\frac{77}{800}$ (d) $\frac{133}{800}$

The table below shows the distribution of weight measure for 100 students

Weight	60-62	63-65	66-68	69-71	72-74
F	5	18	42	27	8

22. Calculate the mean of the distribution to two decimal places (a) 64.45 (b) 62.45 (c) 67.45 (d) 65.45

23. Calculate the mode of the distribution to two decimal places (a) 67.33 (b) 65.33 (c) 65.53 (d) 67.53

24.
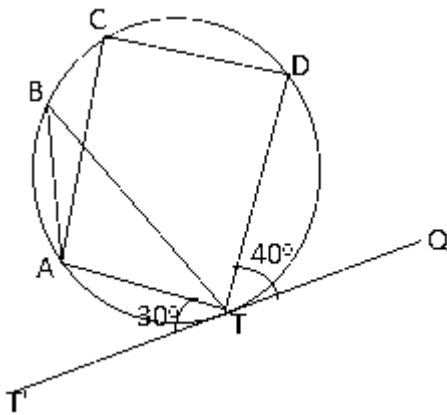
T'Q is a tangent to the circle ABCDT, angle DTQ = 40°, angle ATT' = 30°, then angle ATD is (a) 70° (b) 90° (c) 250° (d) 110°

SOLUTION TO 2007 POST UTME SCREENING TEST

1. Sum of the interior of a polygon
= (n-2) x 180
For pentagon $n = 5$
Sum of the interior of the pentagon
= (5 - 2) x 180 = 3 x 180 = 540
= 180 + 118 + 84 + 78 + x = 540
460 + x = 540
x = 540-460
x = 80° **No correct option**

2. <AOC = 2x (Angle at the centre of a circle = 2x angle at circumference)
x + 65 + 65 -180(sum of the angle of a triangle

x + 13Q = 150
x = 150 - 130
x = 50°
<AOC = 2x = 2(50)
<AOC = 100° **Ans: C**

3. Area of the floor = 5m x 4m
= 500cm x 400cm = 200000cm²
Area of each tile = 20cm x 20n
= 400cm²
$\frac{200000^2}{400cm^2} = 500 tiles$ **Ans:A**

4. Volume of a sphere $=\frac{4}{3}\pi r^3$
Surface area of a sphere = $4\pi r^2$
= $2(47\pi r^2)\frac{4}{3}=\frac{}{}\pi r^3$
$6(4\pi r^2) = 4\pi r^3$
$6(4\pi r^2) = (4\pi r^2)r$
But r = $\frac{d}{2} = 6$
$d = 12$ **Ans:C**

5. 310° – W40° N or N50° W **Ans:A**

6. A triangle can be constructed if three sides, two sides with an included angle or two sides and a right angle are given. **Ans:A**

7. $\bar{x}_1 = \frac{\sum x_1}{n_1}$
$\bar{x}_1 = 9$ and $n_1 = 3$
$9 = \frac{\sum x_1}{3}$
$\sum x_1 = 3 \times 9 = 27$
$\bar{x}_2 = \frac{\sum x_2}{n_2}$
$39 = \frac{\sum x_2}{2}$
$\sum x_2 = 78$
$\sum X = \sum x_1 + \sum x_2$
$= 27 + 78$
$\sum X = 105$
$n = n_1 + n_2 = 3 + 2 = 5$
$\bar{x} = \frac{\sum x}{n} = \frac{105}{5} = 21$ **Ans: A**

8. $1+\frac{2}{3} - 3 \div \left(1 + \frac{2}{3} \text{ of } \frac{6}{7}\right)$
$1 + \frac{2}{3} - 3 \div \left(1 + \frac{4}{7}\right)$
$1 + \frac{2}{3} - 3 \div \left(\frac{7+4}{7}\right)$
$1 + \frac{2}{3} - 3 \div \frac{11}{7}$
$1 + \frac{2}{3} - \frac{3}{1} \times \frac{7}{11}$
$\frac{1}{1} + \frac{2}{3} - \frac{21}{11}$
$\frac{33+22-63}{33} = -\frac{8}{33}$ **Ans:A**

9. $1 + \cfrac{1}{1+\cfrac{1}{1+\frac{1}{x}}}$

$1 + \frac{1}{x} = \frac{x+1}{x}$
$1 + \cfrac{1}{1+\frac{1}{x}} = \cfrac{1}{\frac{x+1}{x}} = \frac{x}{1+x}$
$1 + \cfrac{1}{1+\frac{1}{x}} = 1 + \frac{1}{x+1} = \frac{x+1+x}{x+1}$
$= \frac{2z+1}{x+1}$
$\cfrac{1}{1+\cfrac{1}{1+\frac{1}{x}}} = \frac{1}{2x+1} = \frac{x+1}{2x+1}$
$= \frac{2x+1+x+1}{2x+1}$

$$= \frac{3x+2}{2x+1} = \frac{3x2}{2x+1} = 5$$
3x + 2 = 5 (2x +1)
3x + 2 = 10x + 5
2 − 5 = 10x − 3x
-3 = 7x
x = -3/7   **Ans:C**

10. $41_x - 22_x - 17_x$
Converting each number to base 10
$4 \times x + 1 \times x^0 - (2 \times x + 2 \times x^0)$
$= 1 \times x^1 + 7 \times x^0$
$4x + 1 - 2x - 2 = x + 7$
$2x - 1 = x + 7$
$2x - x = 7 + 1$
$x = 8$ *Ans:B*

11. Cost of 4 bags of rice
    = $4 \times 56_7 = 323_7$
    Cost of 3 bags of beam
    = $3 \times 26_7 = 114_7$
    Total cost of item
    = $323_7 + 114_7 = 440_7$
    Convert 440_7 to base 10
    $440_7 = 4 \times 7^2 + 4 \times 7^1 + 0 \times 7^0$
    = 4 x 49 + 28 + 0
    = 224_{10}
    Convert 124_{10} to base 8

    8   224

    8   28 R 0

    8   3 R 4

               0 R 3

               $224_{10} = 340_{10}$ **Ans:** C

12. Let the original cost of each egg
    The new cost of each egg be ₦$(x + 2)$
    Let the original number of egg be n
    The new number of egg be n - 5 = *Number of eggs*

    $$\frac{Total\ amount\ of\ money\ spend\ on\ egg}{Cost\ for\ each\ egg}$$

    The number of egg (n),₦120 can originally bought for ₦x each is given by
    n $= \frac{120}{x}$
    Subtract 5 from both side
    $n - 5 = \frac{120-5x}{x} \dots \dots \dots. (i)$
    If the price of an egg is increase by ₦x[i.e. price of egg is now $t(x + 2)$]. the number of egg &120 can buy is $n - 5$
    $n - 5 = \frac{120}{x+2} \dots \dots \dots \dots \dots. (ii)$
    Substitute equation 1 into 2
    $\frac{120-5x}{x} = \frac{120}{x+2}$
    $(120 - 5x)(x + 2) = 120x$
    $120x + 240 - 5x^2 - 10x = 120x$
    $-5x^2 - 10x\ 240 = 120x - 120x$
    $-5x^2 - 10x + 240 = 0$
    Divide through by -5
    $x^2 + 2x - 48 = 0$
    x = 6 or - 8
    The original price of an egg = ₦6
    New price of an egg - ₦$(x + 2)$ = ₦8

Ans:C

13. Original amount of money invested is principal (P)
    The sum of money received base on the invested principal is called the amount (A) Since A is to double P
    $A = 2P$
    $R = 8\%$
    $T = ?$
    $I = \frac{PRT}{100}$
    A = P + I
    I = A − P
    $A − P = \frac{PRT}{100}$
    $2P − P = \frac{PRT}{100}$
    $P = \frac{PRT}{100}$
    100P = PRT
    100 = 8T
    $T = \frac{100}{8} = 12.5\ yrs$ **Ans:D**

14. t_1 = 1hr,30mins = 1.5rs
    Let his original speed be $x\ km/hr$
    Speed $= \frac{distance\ covered}{time\ taken}$
    d $= \frac{d}{1.5}$
    d = 1.5x ....(i)
    If he increase his speed by 20km/hr, new speed is $(x + 20)$km/hr. If he saves 15mins as a result of this speed, new time taken is 1hr, 30mins minus 15mins {i.e. 1hr 15min=1.25hr)
    x + 20 $= \frac{d}{1.25}$
    d = 1.25 (x + 20) .... (ii)
    Equate equation I and ii
    1.5x = 1.25 (x + 20)
    1.5x = 1.25 + 25
    1.5x − 1.25x = 25
    0.25x = 25
    $x = \frac{25}{0.25} = 100$
    x = 100km/hr**Ans:A**

15. **B**

16. x = 0.0012 + 0.00074 + 0.003174
    = 0.005114
    0.01(2d.p) or 0.005(1s.f)
    △x = 0.01-0.005 = 0.005   **Ans:D**

17. *But* $H = \frac{x tan\theta_2 tan\theta_2}{tan\theta_2 + tan\theta_2}$
    Where $\theta_1 = 30^0$ *and* $\theta_2 = 45^0$
    $15 = \frac{x tan\ 30\ tan\ 45}{tan 45 + tan 30}$
    $15 = \frac{x \times \frac{1}{\sqrt{3}} \times 1}{1 + \frac{1}{\sqrt{3}}}$
    $15 = \frac{\frac{x}{\sqrt{3}}}{\frac{\sqrt{3}+1}{\sqrt{3}}}$
    $15 = \frac{x\sqrt{3}}{\sqrt{3}(\sqrt{3}+1)}$
    $15 = \frac{x}{\sqrt{3}+1}$
    $X = 15(\sqrt{3} + 1)m$
    Note that if point A and B are on the same side of the erected mass then

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$H = \frac{x \tan\theta_1 \tan\theta_2}{\tan\theta_2 + \tan\theta_1}$ (Where $\theta_2\theta_1$ and x is the distance between A and B **Ans:C**

18. r= 10cm

    Δr- = 0.2cm

    $A = \pi r^2$

    $\frac{\Delta A}{A} = \frac{\Delta\pi}{\pi} + \frac{2\Delta r}{r}$ (using the theory of error)

    $\Delta\pi = 0$,

    $\frac{\Delta A}{A} = 2\frac{\Delta r}{r}$

    $= 2 \times \frac{0.2}{10}$

    $= \frac{0.4}{10} = 0.04$

    $= \frac{\Delta A}{A} \times 100 = 0.04 \times 100 = 4\%$ **Ans:D**

19. $\cos(90 - \theta) = \sin\theta$

    $\sin(180 - \theta) = \sin\theta$

    $\cos(180 - \theta) = -\cos\theta)$

    $= \frac{\cos(90 - \theta) + \sin(180 - \theta)}{\cos(180 - \theta) - \sin(90 - \theta)}$

    $\frac{\sin\theta + \sin\theta}{-\cos\theta - \cos\theta} = \frac{2\sin\theta}{-2\cos\theta} = -\frac{\sin\theta}{\cos\theta} = -\tan\theta$ **Ans:B**

20. Let Y denote Yoruba and I denote Igbo n(Y) = 80 ,

    n (I)= 22, n (Y¹ nI¹) = 6, and n(μ) = 100

    Let n (Y nI) = x

    n (Y) only 80 – x, n(I) only = 22 – x

    100 = 80 – x + x + 22 – x + 6

    100 = 108 –x

    100 – 108 = -x

    -x = 8   **Ans:B**

21. Pr(B or Y) = Pr(B) + Pr (Y)

    $= \frac{9}{20} + \frac{5}{20}$

    $= \frac{14}{20} = \frac{7}{10}$ **No correct option**

22.

Class Boundary	9.5-62.5	2.5 - 65.5	5.5 − 68.5	8.5 - 71.5	1.5 - 74.5
Mean Weight (x)	61	64	67	70	73
Frequency (P)	5	18	42	27	8
Fx	305	1152	2814	1890	584

$$\bar{x} = \frac{\varepsilon x}{\varepsilon f}$$

$= \frac{305 + 1152 + 2819 + 1890 + 584}{5 + 18 + 42 + 27 + 8} = \frac{6745}{100} =$

67.45**Ans:C**

23. Mode $= L_1 + \left(\frac{\Delta_1}{\Delta_2 + \Delta_1}\right)k$,

    Where L_1 is lower class boundary of the modal class, the class with the highest frequency $L_1 = 65.6$,

    Δ_1 = Difference between the frequency of the modal class and the class immediately before it $(\Delta_1 + 42 - 18 = 24)$

    Δ_2 = Difference between the frequency of the modal class and the class immediately after it $(\Delta_2 = 42 - 27 = 15)$

    k = class interval (k = 68.5 − 65.5 = 3

    Mode $= 65 + \left(\frac{24}{24 + 15}\right) \times 3$

    65.5 + 1.8462 = 67.3462 $\cong$ 67.35**Ans: A**

24. Since $TT'Q$ is a straight line

    $<T'TA + <ATD + <DTQ = 180$ (Angles on a straight line)

    $30 + <ATD + 40 = 180 - 30 - 40$

    $<ATD = 180 - 30 - 40$, $<ATD = 110^o$

    Ans:D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2006 POST-UME SCREENING EXERCISE - MATHEMATICS

1. Solve for p in the following equation given in base two 11(p + 110) = 1001p (a) 10 (b) 11 (c) 110 (d) 111

2. Factorize $16(3x + 2y)^2 - 25(a + 2b)^2$
   (a) $(12x + 8y + 5a + 10b)(12x + 8y - 5a - 10b)$
   (b) $(12x + 8y - 5a - 10b)(12x + 8y - 5a - 10b)$
   (c) $20(3x + 2y - a - 2b)(3x + 2y + a + 2b)$
   (d) $20(3x + 2y + 1 + 2b)(3x + 2y + a + 2)$

3. A cone has base radius 4cm and height 3cm. the area of its curved surface is (a) $12\pi cm^2$ (b) $24\pi cm^2$ (c) $20\pi cm^2$ (d) $15\pi cm^2$

4. Let log y + log 3 = 3. Then, y is   (a) $\left(\frac{10}{x}\right)^3$
   (b) $\left(\frac{x}{10}\right)^3$ (c) $\left(\frac{x}{10}\right)^{-3}$ (d) $\left(\frac{10}{x}\right)^{-\frac{1}{3}}$

5. If $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$, then y is   (a) $\pm\frac{b}{a}\sqrt{x^2 - a^2}$ (b) $\frac{a}{b}\sqrt{a^2 - x^2}$ (c) $\pm\frac{a}{b}\sqrt{x^2 - a^2}$ (d) $\pm\frac{b}{a}\sqrt{a^2 - x^2}$

6. A cyclist rode for 30 minutes at x km/hr. and due to a breakdown he had to push the bike for 2hrs at (x-5)km/hr. If the total distance covered is less than 60km, what is the range of values for x?
   (a) x< 14   (b) x <20   (c) x < 29 (d) x < 28

7. A businessman invested a total of ₦200,000.00 in two companies which paid dividends of 5% and 7% respectively. If he received a total of ₦11,600.00 as dividend, how much did he invest at 5%?   (a) ₦160,000   (b) ₦140,000 (c) ₦120,000 (d) ₦80,000

8. In a class, 37 students take at least one of Chemistry, Economics and Government, 8 students take Chemistry, 19 take Economics and 25 take Government, 12 students take Economics and Government but nobody takes Chemistry and Economics. How many students take both Chemistry and Government? (a) 3 (b) 4 (c) 5 (d) 6

9. Z is party constant and partly varies inversely as the square of d. when d = 1, z = 11 and when d = 2, z = 5. Find the value of z when d = 4. (a) 2 (b) 3.5 (c) 5 (d) 5.5

10. Expand the expression $(x^2 - 2x - 3)(x^2 + x + 1)$ (a) $x^2 - 4x^2 - 5x - 3$ (b) $-x^3 - 4x^2 + 5x - 3$ (c) $x^4 - x^3 - 4x^2 - 5x - 3$ (d) $x^4 - 4x^2 - 5x - 3$

    Suppose we have matrices $A = \begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 0 & 2 \\ 4 & 3 \end{pmatrix}$

11. Find $A^2 + AB - 2A$ (a) $\begin{pmatrix} -5 & -9 \\ 12 & 14 \end{pmatrix}$ (b) $\begin{pmatrix} -1 & -4 \\ 8 & 7 \end{pmatrix}$ (c) $\begin{pmatrix} -4 & -4 \\ 12 & 13 \end{pmatrix}$ (d) $\begin{pmatrix} 0 & -4 \\ -8 & -6 \end{pmatrix}$

12. The inverse of matrix B is (a) $\frac{1}{8}\begin{pmatrix} -3 & 2 \\ 4 & 0 \end{pmatrix}$ (b) $\begin{pmatrix} -3 & 2 \\ 4 & 0 \end{pmatrix}$ (c) $\frac{1}{8}\begin{pmatrix} 3 & -4 \\ -2 & 0 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

13. The indefinite integral of the function $f(x) = x\cos x$ for any constant k, is (a) $-x\cos x + \sin x + k$ (b) $x\sin x - \cos x$ (c) $x\sin x + \cos x + k$ (d) $x + \sin x + \cos x + k$

14. Evaluate the integral $\int_1^2 \left(x^2 + \frac{1}{x}\right)dx$ (a) $\frac{8}{3} + In2$ (b) $\frac{7}{3} + In2$ (c) $\frac{7}{3} - In3$ (d) $\frac{8}{3}$

15. The trigonometric expression $cos\,2A + sin\,2A$ can be written as (a) $cosA(cos\,A - sinA)$ (b) $cos^2 A + sin^2 A - 2\sin A\cos A$ (c) $2\sin A\cos A + cos^2 A + sin^2 A$ (d) $cos^2 A + sin^2 A - 2sin A\cos A$

Suppose D,E and P are subsets of a universal set U. Let U be the set of natural numbers not greater than 10, while D, E and P are respectively the set of odd numbers, even number and prime number. For any set X, its complement is denoted by X' and ϕ denote the empty set

16. Display the set $D \cap P$ (a) $\{3, 5, 7\}$ (b) $\{2\}$ (c) $\{4, 6, 8, 10\}$ (d) $\{2, 3, 5, 7\}$

17. Find $D \cap E$ (a) $\{2\}$ (b) $\{3, 5\}$ (c) $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ (d) Φ

A bag contains 10 balls of which 3 are red and 7 are white. Two balls are drawn at random. Find the probability of none of the balls is red if the draw is

18. With replacement: (a) 0.9 (b) 1 (c) 0.4 (d) 0.49

19. Without replacement: (a) 0.1 (b) 0.47 (c) 0.42 (d) 0.21

20. A regular polygon has each of its angles as 160º. What is the number of sides of the polygon? (a) 36 (b) 9 (c) 18 (d) 20

21. A girl walks 30m from a point P on a bearing of 040º to a point Q. She then walks 30m on a bearing of 140º to a point R. the bearing of R from P is (a) 90º (b) 50º (c) 45º (d) 40º

22. How many different three digit numbers can be formed using the integers 1 to 6 if no integer occurs twice in a number? (a) 24 (b) 120 (c) 60 (d) 48

In how many different ways can the letters of the word GEOLOGY be arranged in order? (a) 720 (b) 1260 (c) 2520 (d) 5040

SOLUTION TO 2006 POST UTME SCREENING TEST

1. $11 (P + 110) = 1001P$, $11(P) + 11(110) = 1001(P)$
But $11(110) = 10010$, $11(P) + 10010 = 1001(P)$,
Collect like terms, $10010 = 1001(P) - 11(P)$
$10010 - [1001-11](P)$, $10010 = 110(P)$
$P = \frac{10010}{110} = 11$ **Ans: B**

2. $16(3x + 2y)^2 - 25(a + 2b)^2$
$= 4^2(3x + 2y)^2 - 5^2(a + 2b)^2$
$= \{4(3x + 2y)\}^2 - \{5(a + 2b)\}^2$
$a^2 - b^2 = (a + b)(a - b)$
$= \{4(3x + 2y) + 5(a + 2b)\}\{4(3x + 2y)$

$= -5(a - 2b)\}$
$\{12x + 8y + 5a + 10b\}\{12x + 8y - 5a - 10b\}$ **Ans:A**

3. r = 4cm, h = 30m
△OBC is a right angle triangle.
Let /BC/ = L (the slant height)
$L^2 = 3^2 + 4^2$
$L^2 = 9 + 16 = 25$
$L = \sqrt{25} = 5cm$
Curve surface area of a cone
$2\pi L = 2\pi \times 4 \times 5 = 20\pi cm^2$ B ***Ans: C***

4. $logy + Iog3 = 3$
$Log_{10}^{y} + Log_{10}^{3} = 3$
$Log_{10}^{1000} = 3$
$Log_{10}^{y} + Log_{10}^{3} = Log_{10}^{1000}$
$Log_{10}^{3} = Log_{10}^{1000}$
$y = \frac{1000}{3}$ ***No correct option***

5. $\frac{x^2}{x^2} = \frac{y^2}{b^2} = 1$
$\frac{x^2}{a^2} - 1 = \frac{y^2}{b^2} = \frac{x^2 - a^2}{a^2} = \frac{y^2}{b^2}$
$y^2 = \frac{b^2(x^2 - a^2)}{a^2} = y = \sqrt{\frac{b^2(x^2 - x^2)}{a^2}}$
$y = \frac{\pm\sqrt{x^2 - a^2}}{a} y = \frac{\pm b}{a}\sqrt{x^2 - a^2}$ **Ans:A**

6. Let the distance covered in the first 3Gmins (0.5hr) be d_1 and distance in the 2hrs be d_2.
$x = \frac{d_1}{t_1}$
$d_1 = xt_1 = 0.5x \ldots\ldots\ldots(i)$
$x - 5 = \frac{d_2}{2}$
$d_2 = 2(x - 5) \ldots\ldots\ldots\ldots(ii)$
$d = d_1 + d_2 = 0.5x + 2(x - 5)$
$0.5x + 2x - 10$
$d = 2.5x - 10$
But $d < 60$
$= 2.5x - 10 < 60$
$2.5x < 60 + 10$
$2.5x < 70$
$x < \frac{70}{2.5} or\ x < 28$ ***Ans: D***

7. Let the amount invested at 5% be ₦x
Then the amount invested at 7% will be
#(200,000 - x)
$I_1 = \frac{5}{100} \times x = \frac{5x}{100} = 0.05x,$
$I_2 \frac{7}{100} \times (200,000 - x)$
$= 0.07(200,000 - x),$
$= 14000 - 0.07x$
$I = I_1 + I_2 = 0.05x + 14000 - 0.07x$
$I = -0.02x + 14000$
But 1 (total dividends) = N1 600.00
$11600 = -0.02x + 14000$
$11600 - 14000 = -0.02x$
$x = \frac{2400}{-0.02} = 120,000.00$ **Ans:C**

8. Let the universal set be denoted by n, chemistry by C, Economics by E and Government by G.
$n(\mu) = 37$, $n(C) = 8$, $n(G) = 25$, $n(E) = 19$, $n(Eng] = 12$, $n(CnE) = 0$
Let $\cap (C \cap G) = x$ and $\cap (G \cap E) = y = 12$
n(C)only = 8 - x

$C(G)only = 25-(x + y)$,

$\cap(E)only = 19 - y$

$37 = 8 - x + 25 - (x + y) + y + 19 - y$

$37 = 52 - x - y$,

$37 - 52 = -x -y$,

$-15 = -(x + y)$,

$x + y = 15$, $= \cap$ (G)only $= 25 - (x + y) = 25 - 15 = 10$, $x + y = 15$, $x+12 = 15$, $x = 15- 12 = 3$, n(C n G) = 3 **Ans:A**

9. $Z = k_1 = \frac{k_2}{d_2}$

Where d = 1 and z = 11,

$11 = k_1 = + \frac{k_2}{1^2}$, $11 = k_1 + k_2$,

$k_2 = 11 - k_1 \ldots\ldots\ldots (i)$,

When $d = 2$

$z = 5$,

$5 = k_1 + \frac{k_2}{2^2}$,

$5 = k_1 = \frac{k_2}{4}$

Multiply by 4,

$20 = 4k_1 + k_2$

$k_2 = 20 - 4k_1 \ldots\ldots\ldots (ii)$

Equate Equation i and ii

$11 - k_1 = 20 - 4k_1$

$4k_1 - k_1 = 20 - 11$

$3k_1 = 9$

$k_1 = 3$

But $k_2 = 11 - k_1$

$= 11 - 3 = 8$

$Z = k_1 + \frac{k_2}{1^2}$

$Z = 3 + \frac{8}{d^2}$

When d = 4

$Z = 3 + \frac{8}{4^2} = 3 + \frac{8}{16} = 3 + 0.5$

$Z = 3.5$ **Ans:B**

10. $(x^2 - 2x - 3)(x^2 + x + 1)$

$(x^4 + x^3 + x^2 - 2x^3 - 2x^3 - 2x - 3x^2 - 3x - 3$

$x^4 - x^3 - 4x^2 - 5x - 3$ **Ans:C**

11. $A^2 = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix}$

$AB = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} 0 & 2 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} -4 & -1 \\ 12 & 13 \end{bmatrix}$

$2A = 2\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} 2 & -2 \\ 4 & 6 \end{bmatrix}$

$A^2 + AB - 2A = \begin{bmatrix} -1 & -4 \\ 8 & 7 \end{bmatrix} + \begin{bmatrix} -4 & -1 \\ 12 & 13 \end{bmatrix} - \begin{bmatrix} 2 & 2 \\ 4 & 6 \end{bmatrix} = \begin{bmatrix} -7 & -7 \\ 16 & 14 \end{bmatrix}$ **No correct option**

12. Let the inverse of matrix $B = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

But $B^{-1}B = I$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} 0 & 2 \\ 4 & 3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$\begin{bmatrix} 4b & 2a + 3b \\ 4d & 2c + 3d \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $4b = 1$, $b = \frac{1}{4}$

$2a + 3b = 0$ $2a + 3\left(\frac{1}{4}\right) = 0$, $2a = -\frac{3}{4}$

$a = \frac{-3}{8}$, $4d = 0$, $d = \frac{0}{4} = 0$

$2c + 3d = 1$ $2c + 3(0) = 1$

$2c + 0 = 1$ $c = \frac{1}{2}$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} -\frac{3}{8} & \frac{1}{4} \\ \frac{1}{2} & 0 \end{bmatrix} = \frac{1}{8}\begin{bmatrix} -3 & 2 \\ 4 & 0 \end{bmatrix}$ ***Ans: A***

13. Using integration by path

$\int u dv = uv - \int v du$

Let $u = x dv = \cos x dx$, $\frac{du}{dx} = 1$ $v = Sinx$

$= xsinx + \cos + k$, $= xsinx + \cos x + k$, ***Ans: C***

14. $\int_1^2 \left(x^2 + \frac{1}{x}\right) dx$

$\left[\frac{x^3}{3} + In\, x\right]_1^2 = \left[\frac{2^3}{3} + In\, 2\right] - \left[\frac{1^3}{3} + In\, 1\right]$

$\left[\frac{8}{3} + In\, 2\right] - \left[\frac{1}{3} + In\, 1\right]$

But $In\, 1 = 0$

$\left[\frac{8}{3} + In\, 2\right] - \left[\frac{1}{3} + 0\right]$

$\frac{8}{3} - \frac{1}{3} + In\, 2 = \frac{7}{3} + In\, 2$ **Ans:B**

15. $Cos2A = \cos^2A - \sin^2A$

$Sin2A = 2sinA\, cosA$

$Cos2A + Sin2A = 2sinAcosA + \cos^2 A - \sin^2A$

No correct option

16. $U = \{1,2,3,4,5,6,7,8,9,10\}$ $D = \{1,3,5,7,9\}$

$E = \{2,4,6,8,10\}$ $P = (2,3, 5, 7)$

$D' = \{2,4,6,8,10\}$ $D' \cap P = \{2\}$ **Ans: B**

17. $D \cap E = \emptyset$ ***Ans:D***

18. Since none of the two ball pick is red. then they are both white

Pr (W) $= \frac{7}{10} X \frac{7}{10} = \frac{49}{100} = -0.49$ ***Ans: D***

19. If the pick is done without replacement

Pr (W) $= \frac{7}{10} X \frac{6}{9} = \frac{14}{30} = 0.47$ **Ans:B**

20. Each interior angle of a polygon is equal to

$\frac{(n-2)180}{n}$, $160 = \frac{(n-2)180}{n}$, $160n = 180n - 360$,

$160n - 180n = -360$, $-20n = -360$

$n = -\frac{360}{20} = 18$ **Ans:C**

21. $q^2 = 30^2 + 30^2 - 2 X 30 X 30cos80$

$= 1800 - 312.5667$, $= 1487.4332$

$q = \sqrt{1487.4333} = 38.5673m$

$\frac{30}{Sin\theta} = \frac{38.5673}{Sin80}$

$Sin\, \theta\, \frac{30Sin80}{38.5673} = 0.7660$

$\theta = Sin - 1(0.7660)$

$= 49.9999 \cong 50^o$

Bearing of R from P = 40 + 50 = 90° **Ans:A**

22- The digit given are1,2,3,4,5,6. Since we have 6 digits to take three at a time. The number of three digit form is $6p_3$

$6p_3 = \frac{6!}{(6-3)!} = \frac{6 X 5 X 4 X 3!}{3!} = 120$ **Ans:B**

23. n = 7, r = 2,2

Number of ways $= \frac{7!}{2!2!} = \frac{5040}{2 X 2} = \frac{5040}{4}$

$= 1260\, ways$ ***Ans: B***

1. When $CuSO_4$ solution is treated with ammonia solution drop by drop till it is added in excess, a precipitate is first formed which then dissolves in excess to give a deep blue solution. The deep blue solution is
A. $Cu(OH)_2$ B.$(Cu(NH_3)_4)(OH)_2$ C.$CuSO_4$ D.$(Cu(NH_3)_2)SO_4$

2. If 7.0 g of ethane at s.t.p occupy 5.6 dm³, what volume will 7.5 g of ethane at the same condition occupy? (C = 12; H =1; GMV at s.t.p = 22.4 dm³)
A.6.0 dm³ B.5.6 dm³ C.5.2 dm³ D.9.4 dm³

3. Which of the alcohol below is likely to be oxidiezed to give the acid,

   CH_3 - C H - COOH?

       CH_3

   A.Butan-1-ol   B.2-methylpropan-2-ol
   C.2-Methylpropan-1-ol   D.Propane-2-ol

4. The name of $CH_3-OCOC_2H_5$ is, A.methoxyethane B.methyl propanoate C.ethyl ethanoate D.propyl methanoate

5. Which of these elements has the highest first ionization energy? A. Rb B.Li C. Na D.K

6. Which of the following is responsible for the conduction of electricity in a gas enclosed in a glass tube containing two electrodes at a reduced pressure and to which a high voltage is applied?
   A.Cations and anions
   B. Cations   C. Electrons   D. Cations and electron

7. The type of reaction an alkanoic acid cannot undergo is A. Oxidation B. Combustion C. Decomposition D. Esterification

8. What is the pH of 2.5 x 10^{-2} mol dm⁻³ barium hydroxide solution? A.11.5   B.11.6   C.11.7   D.11.8

9. The complete oxidation of proan -1-ol yields A.CH_3CH_2CHO B.CH_3COCH_3 C.CH_3COOH_3 D.CH_3CH_2COOH

10. Which of the following will change the equilibrium constant of the reaction
    $CO_{(g)} + H_2O \rightleftharpoons CO_{2(g)} + H_{2(g)}$?
    A. Increase of temperature   B. Increase of concentration of CO   C.Removal of CO_2 from the mixture   D. Decrease of pressure

11. $M_{(S)} + xH_2SO_{4(aq)} \rightarrow M(SO_4)_{x(aq)} + xH_{2(g)}$
    Which of the following elements will not undergo the above reaction?
    A. Zn B.Na C. Cu D. Ca

12. A physical change is exemplified by the
    A. burning of bush   B. rusting of a metal
    C. dissolution of calcium in water
    D. heating of ammonium chloride

13. The number of neutrons in the deuterium atom is/are A. 0 B.1 C.2   D.3

14. Which of these is correct about methyl orange? A. Yellow in excess aqueous hydrogen ions   B. Pink in excess aqueous hydrogen ions   C. Orange in excess aqueous hydrogen ions   D. Colourless in excess aqueous hydrogen ions

15. Which of these does not affect the rate of a particular chemical reaction?   A. The order of the reaction   B.The size of the particle of the reactants C.The temperature of the reaction   D. The concentration of reactants

16. An ideal gas changing volume as temperature rises can be represented by gthe diagram below:
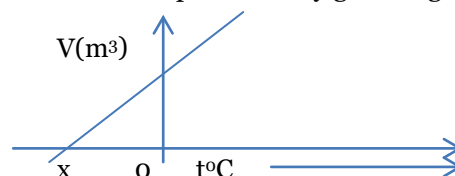
    A. -273 K B.273 K   C.273ºC D.-100 K

17. How many isomeric dichlorobenzenes are obtainable? A. 1 B.2 C.3 D.4

18. By accurate description, ozone in the reaction,
    $O_{3(g)} + H_2O_{2(l)} \rightarrow H_2O_{(l)} + 2O_{2(g)}$
    A. displace to form oxygen
    B. decomposed to form oxygen
    C. oxidized to oxygen
    D. reduced to oxygen

19. 150 cm³ of nitrogen II oxide were sparked with 100 cm³ of oxygen, what volume of nitrogen IV oxide will be produced at s.t.p? A.100 cm³   B.75 cm³   C.50 cm³ D.150 cm³

20. Which of the following ions will interact with water to give a solution of pH < 7?   A.Na^+ B.NH_4^+ C.CN^- D. $HCOO^-$

SOLUTION TO CHEMISTRY 2014

1. B
2. No. of moles = $\frac{mass(g)}{22.4 dm^3 mol^{-1}}$ \
   Molar mass of ethane $C_2H_6 \rightarrow$ (12 x 2) + (1x4) $\rightarrow$ 28g
   $\frac{7.5}{30} \rightarrow$ 0.25mol
   No of mole = $\frac{volume\ occupied\ (dm^3)}{22.4\ dm^3 mol^{-1}}$
   Volume occupied (dm³) = No of moles (mole) x 22.4dm³mol⁻¹
   $\rightarrow$ 0.25mol x 22.4 dm³ mol⁻¹
   $\rightarrow$ 5.6 dm³   **Ans: B**
3. A
4. C   ethyl   ethanoate
   (structure diagram)
5. A
6. B
7. B
8. $Ba(OH)_{2(aq)} \rightarrow 2OH^- + Ba^{2+}$
   1 mol dm⁻³   2 mol dm⁻³ 1 mol dm⁻³

$2(2.5 \times 10^{-3})$.

$OH = 5.0 \times 10^{-3}$

pOH of the solution $= -\log_{10}(OH^-) = -\log_{10}(5.0 \times 10^{-3}) \rightarrow 2.3010$

pH + pOH = 14

$p = 14 - pOH \rightarrow 14 - 2.3010$

$\rightarrow 11.7$ **Ans:C**
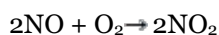
9. D
10. B.
11. D
12. C
13. C
14. A
15. A
16. A

V(cm³)

-273K 273K   T (K)

17. A
18. C
19. D

$2NO + O_2 \rightarrow 2NO_2$

Initially	150cm³ 100cm³—	
Gay-lussac's law	2uols 1oul 2ouls	
Vol. used up for reaction	100cm 100cm³–	
Vol. left after reaction	30cm³— 100cm³	

Volume of nitrogen (iv) oxides $\rightarrow$ 50cm³ + 100cm

$\rightarrow$ 150cm³

20. C – Acidity is less than 7 while alcalinity is greater than 7

**OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE, NIGERIA 2013 POST-UTME
SCREENING EXERCISE
CHEMISTRY**

1. A motor truck releases an average of 5.0g CO into air for every km covered. How many molecules of CO will be emitted into the air if the truck travels 8 km? $[C = 12; O = 16; N_A = 6.02 \times 1023]$

   (a) 4.32×10^{22} (b) 2.48×10^{22} (c) 8.6×10^{23}

   (d) 6.82×10^{21}

2. A sample of an organic compound was weighed to 0.250g and subjected to Kjeldahl treatment. The ammonia produced was neutralized by $27.0 cm^3$ of 0.100 mol dm^{-3} HCI. What is the percentage of nitrogen in the compound? $[H = 1; N = 14]$ (a) 18.4% (b)17.8% (c)15.1% (d)13.3%

3. Given the half-redox reaction $O_2 + 4H^+ + 4e^- \rightarrow 2H_2O$, how many moles of electron will be required produce 3.0×10^{22} molecules of water $(a) 0.05 (b) 0.10 (c) 0.15 (d) 2.0$

4. The quantum number l in an atom defines (a) the shell K, L, M (b) orbitals (c) multiplicity (d) degeneracy of orbitals

5. The hybridization of the central atom in a molecule (a) dictates the shape of the molecule (b) shortens the sigma bond in the molecule (c) distorts the shape of the molecule (d) serves to explain the shape of the molecule.

6. Lithium with atomic number of 3 is a (a) Strong reducing agent (b) Strong oxidizing agent (c) Weak reducing agent (d) Weak oxidizing agent

7. The correct name for $HCOOC_2H_5$ is (a) methylethanoate (b) ethylethanoate (c) ethylmethanoate (d) propylethanoate

8. When CaC_2 reacts with water, the organic product forms is (a) ethanol (b) ethanoic acid (c) ethane (d) ethyne

9. $100 cm^3$ of ethyne was mixed with $240 cm^3$ of oxygen in a combustion chamber. What volume of carbon (iv) oxide is produced? (a) $100 cm^3$ (b) $24 cm^3$ (c) $138 cm^3$ (d) $192 cm^3$

10. Uranium-235 explodes when bombarded with a slow moving neutron according to the equation below:

    $$^{235}_{92}U + ^1_0n \rightarrow ^{94}_{36}Kr + Ba + 3^1_0n$$
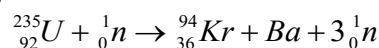
    The atomic number and mass of Ba respectively are (a) 46 and 126 (b) 36 and 116 (c) 56 and 139 (d) 66 and 146

11. The reduction potential of two electrodes are

    $X^{2+} + 2e^- \rightarrow X, E^0 = 0.042V$

    $Y^+ + e^- \rightarrow Y, E^0 = 0.012V$

    Calculate the free energy change for the cell that is made up of the electrodes $[F = 96500 \text{ Coulomb mol}^{-1}]$ (a) 4.20kJ (b) 5.79kJ (c) 6.86kJ (d) 10.55kJ

12. Which of $SF_4, SiH_4, CO_2, ICI, CH_2CI_2, SO_2$ and XeO_3 will not show the property of permanent dipole? (a) CO_2 and SiH_4 only (b) SF_4 and SIH_4 only (c) CO_2, SiH_4 and XeO_3 only (d) SF_4, SiH_4, CO_2 and ICI

13. A sample of water weighs 200.00g at 298K. What is the volume of this quantity of water in cubic meters given that the density of water at $298K$ is $0.98 gcm^{-3}$? (a) $2.04 \times 10^{-3} m^3$ (b) $2.04 \times 10^{-6} m^3$ (c) $2.04 \times 10^{-9} m^3$ (d) $2.04 \times 10^{-4} m^3$

14. What is the pH of $500 cm^3$ of 0.02 mol dm^{-3} tetraoxosulphur (VI) acid? (a) 1.456 (b) 1.333 (c) 1.455 (d) 1.699

15. The main product of electrophilic addition of HCl to 2-methylpropene is (a) 2-chloro-2-methylbutane (b) 2-chloro-2-methylbutene (c) 2-methyl-2-chloropropene (d) 2-chloro-2-methylpropane

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16. Which of the following compounds would you expect to show positive iodoform test? (i) Butanone (ii) Propanoic acid (iii) Ethanol (iv) Benzaldehyde (v) But-2-one (a) (i) and (ii) (b) (i) and (iii) (c) (iv) and (v) (d) (ii) and (iii)

17. The complete combustion of one mole of an alkanol is shown below $C_nH_{2n+1}CHO + xO_2 \rightarrow yCO_2 + 2H_2O$ What is the value of x in terms of n? (a) $\dfrac{3n+1}{2}$ (b) $\dfrac{3n-1}{2}$ (c) $\dfrac{3n}{2}$ (d) $\dfrac{3n+3}{2}$

18. An ion has a charge of +3. The nucleus of the ion has a mass of 120. The number of neutrons in the nucleus is 1.50 times that of the number of orotons. How many electrons are in the ion? (a) 55 (b) 48 (c) 45 (d) 42

19. Consider the following-reactions

    (i) $LiOH + CO_2 \rightarrow Li_2CO_3 + H_2O$

    (ii) $2H_2 + O_2 \rightarrow 2H_2O$

    (iii) $2Cu + O_2 \rightarrow 2CuO$

    (iv) $HCl + AgNO_3 \rightarrow AgCl + HNO_3$

    Which of these reactions are redox reactions? (a) (i) and (iii) only (b) (i), (ii) and (iii) only (c) (ii) and (iv) only (d) (ii) and (iii) only

20. Which of the following metals cannot displace hydrogen from steam? (a) Copper (b) Iron (c) Strontium (d) Lithium

21. Consider the exothermic reaction $2SO_{2(g)} + O_{2(g)} \rightarrow SO_{3(g)}$. If the temperature of the reaction is reduced from 600 °C to 300 °C and no other changes take place then (a) the reaction rate increases (b) concentration of SO_3 decreases (c) concentration of SO_3 increases (d) SO_2 gas becomes unreactive

22. The molarity of 5% by weight of aqueous solution of tetraoxosulphate(VI) acid [molecular weight = 98] is (a) $0.537 moldm^{-3}$ (b) $0.208 moldm^{-3}$ (c) $0.551 moldm^{-3}$ (d) $0.333 moldm^{-3}$

SOLUTION TO CHEMISTRY 2013
1.C 2.C 3.B 4.D 5.A 6.A 7.C 8.D 9.D 10.C 11.B 12.D 13.D 14.No correct option 15.D 16.B 17.A 18.C 19.D 20.A 21C 22.A

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2012 POST-UTME SCREENING EXERCISE CHEMISTRY

1. During the electrolysis of dilute tetraoxosulphate (VI) acid solution, 0.05 mole of electrons were passed. What volume of gas was produced at the anode? (a) 2.24dm³ (b) 0.560dm³ (c) 0.280dm³ (d) 0.224dm³

2. What volume of 0.750moldm⁻³ Na₂CO₃ solution could be diluted to 250cm³ to reduce the concentration of 0.025moldm³? (a) 16.8cm³ (b) 14.2cm³ (c) 10.4cm³ (d) 8.3cm³

3. When 70cm³ of 3.0 moldm³ Na₂CO₃ is added to 30cm³ of 1.0moldm³ NaHCO₃, the concentration of Na^+ ions in moldm⁻³ in the solution is (a) 1.5 (b) 4.5 (c) 2.0 (d) 3.5

4. The reaction, Y→Product is of first order with the initial concentration of $Y = 3.55 \times 10^{-3}$ moldm³ and the rate constant of $5.25 \times 10^{-3} s^{-1}$. What is the half-life of the reaction? (a) 350s (b) 215s (c) 132s (d) 615s

5. Given the half-cell reaction, $2Br \rightarrow Br_2$, how many moles of electron will be required to produce 0.56dm³ of bromine at s.t.p.? [molar volume of gas at s.t.p 22.4 dm³] (a) 0.05 (b) 0.10 (c) 020 (d) 1.00

6. The equilibrium constant, Kc for the reaction, $NO_{(g)} + \frac{1}{2}O_{2(g)} \rightarrow NO_{2(g)}$, is 35.2. What is the value of K for the reaction, $NO_{2(g)} \rightarrow NO_{(g)} + \frac{1}{2}O_{2(g)}$ (a) 35.2 (b) 17.6 (c) 2.84 x 10⁻² (d) 1.24 x 10³

7. An atom has a core and outside the core an electron occupies an orbital for which the principal quantum number $n = 4$, $\mathcal{L} = 0$, $m = 0$ and $s = +\frac{1}{2}$ or $-\frac{1}{2}$. The atom is likely to be (a) boron (b) sodium (c) potassium (d) fluorine

8. An element B, has two isotopes $^{20}_{10}B$ and $^{22}_{10}B$ present in ratio 2:3. The relative atomic mass of B is (a) 20.5 (b) 21.2 (c) 23.4 (d) 25.0

9. What quantity of current is required to deposit 2.4g of copper in a period of 750 seconds during an electrolytic deposition process? [Cu 64, IF = 96500C mol⁻¹] (a) 9.65A (b) 10.81A (c) 12.33A (d) 15.54A

10. Platinum electrodes are dipped into copper sulphate solution in a voltameter. The solution left after electrolysis is (a) clear (b) blue (c) pale blue (d) sky blue

11. What volume of water is produced when a mixture of 150cm³ of hydrogen and 100cm³ of oxygen is exploded in a eudiometer? (a) 250cm³ (b) 150cm³ (c) 100cm³ (d) 50cm³

12. A chloroform solution of pure organic compound was spotted at a distance 0.80cm from the base of a 20cm long chromatoplate. If the compound has the r_f-value of 0.505 and moves half way up the 20cm long plate, which is the distance of the solvent front from the top of the plate upon elution? (a) 0.80cm (b) 1.0cm (c) 1.2cm (d) 1.4cm

13. The main organic product named when bromine water is added to but-1-ene is (a) 1-bromobutane (b) 2-bromobutane-1-ol (c) 1-bromobutan-2-ol (d) 2-bromobutan-2-ol

14. The standard reduction potentials for the following half-cell reactions are,

    $2H_2O_{(l)} \rightarrow O_{2(g)} + 4H^+_{(aq)} + 4e$ $E^o = -1.23V$
    $2H_2O_{2(l)} \rightarrow 2O_{2(g)} + 4H^+_{(aq)} + 4e$ $E^o = -0.68V$ (a) -0.66V (b) -1.23V (c) +0.554V (d) +1.91V

15. Bonding in ammonium chloride is (a) ionic, covalent and dative (b) ionic and covalent (c) covalent and dative (d) ionic

16. Valence shell electron pair theory through hybridization predicts that boron trichloride is (a) Arrhenius acid (b) Lewis base (c) Lewis acid (d) Lowry-bronsted base

17. The basic tenet of valence bond electron pair repulsion theory is that the pairs of electrons making the sigma bonds dictate the shape of molecules. The pi-bonds often encounter in some molecules serve to (a) distort the shape of molecules (b) alter the angle between the atoms in molecules (c) shorten the sigma bonds in molecules (d) explain the shape of molecules.

18. A chemical equilibrium is established when (a) concentration of the reactants and products are equal (b) reactants in the system stop forming the products (c) concentrations of the reactants and products remain unchanged (d) reactants in the system are completely transformed to products

19. Oxygen is extracted from water by (a) displacement reaction (b) oxidation reaction (c) reduction reaction (d) decomposition reaction

20. Excess ethanol was soarked with 3g of pure oxygen in a combustion chamber. How many molecules of CO_2 are produced? [N = 6.02 x 10^{23} molecules mol^{-1}] (a) 6.02 x 10^{23} (b) 3.01 x 10^{23} (c) 3.76 x 10^{22} (d) 2.84 x 10^{21}

21. Forty (40) grams of sodium nitrate were added to 50cm³ of water to give a saturated solution at 298K. If the solubility of the salt is 10.50 mol dm^3 at the same temperature, what percentage of the salt is left undissolved? [Na = 23, N = 14 and O = 16] (a) 11.56% (b) 2.55% (c) 5.88% (d) 12.45%

22. The energy for the dissociation of molecule AB in kJ in the diagram of energy against the reaction coordinate shown below is,
    (a) 146 (b) -540 (c) 682 (d) 398
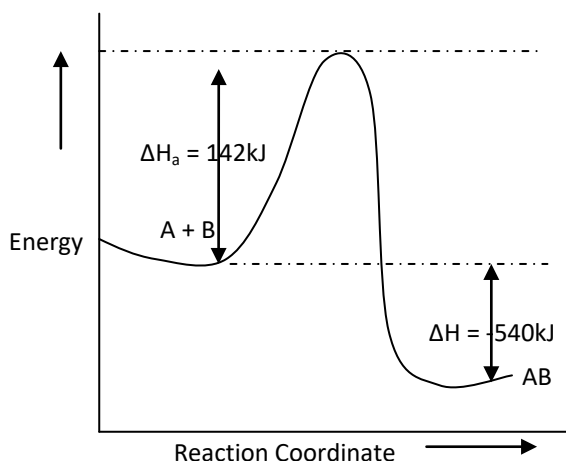
SOLUTION TO CHEMISTRY 2012
1. C 2.D 3.B 4.C 5.A 6.C 7.C 8.B 9.A 10.A 11.B 12.B 13.C 14.C 15.A 16.C 17.A 18.C 19.B 20.C 21No correct option 22.C.

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2011 POST-UTME SCREENING EXERCISE CHEMISTRY

1. What condition favours the formation of the product for the endothermic reaction,
   $$N_2O_{4(g)} \rightarrow 2NO_{2(g)}$$
   A. A decrease in pressure B. A decrease in volume
   C. An increase in pressure D. A constant volume

2. What is the percentage yield of water if 0.90g of water is obtained when 29.0g of butane is burned in excess oxygen? A 0.02% B 0.20% C. 2.0% .D. 10.0%

3. The order of reactivity of five metals is P>Q > R> S>T. Which of the following reactions can occur spontaneously? A. $T + P^+ \rightarrow T^+ + P$ B. $Q + T^+ \rightarrow Q^+ + T$ C. $R + Q^+ \rightarrow R^+ + Q$ D. $T + R^+ \rightarrow T^+ + R$

4. An element, Y has the electronic configuration of $1s^2\ 2s^22p^63s^23p^3$. A.Y is a period III element B. Y contains three electrons in the outer shell C. Y is a transition metal D. Y can engage in bonding with the s and p orbitals

5. Which of the following is NOT implicated as a major cause of global warming? A. NO_2 B. CO_2 C. $CFCl_3$ D. CF_2Cl_2

6. Which of the following shows little or no net reaction when the volume of the system is decreased? A. $2O_{3(g)} \rightleftharpoons 3O_{2(g)}$ B. $2NO_{2(g)} \rightleftharpoons N_2O_{4(g)}$ C.$H_2 + I_{2(g)} \rightleftharpoons 2HI_{(g)}$ D.$PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{2(g)}$

7. A solution of 0.20 mole of NaBr and 0.20 mole of $MgBr_2$ in 2.0 dm³ of water is to be analysed. How many moles of $Pb(NO_3)_2$ must be added to precipitate all the bromide as insoluble $PbBr_2$? A. 0.30 mol B. 0.10 mol C. 0.20 mol D. 0.40 mol

8. A given volume of methane diffuses in 20s. How long will it take the same volume of sulphur (IV) oxide to diffuse under the same conditions? [C = 12, H = 1, S = 32, O = 16]. A. 5s B. 20s C. 40s D. 60s

9. The reaction, $A + B \rightarrow C$, can be represented by the equation, r = k[A][B], k in this equation is, A. proportionality constant A rate constant C. equilibrium constant D. Boltzmann constant

10. The reaction that takes place in Daniel cell is, A. Zn/Zn²⁺//Cu²⁺/Cu B. Zn/Zn²⁺//Cu/Cu²⁺ C. Zn²⁺/Zn//Cu²⁺/Cu D. Zn²⁺/Zn//Cu/Cu²⁺

11. Which of the followings is composed of the elements, H, O, Al, and Si? A. Urea B. Silica C. Bauxite C. Bauxite D. Clay

12. Which of the followings is not a chemical reaction? A. Burning of bush B. Rusting of iron C. Decay of bitter leaves D. dissolution of potassium hydroxide pellets.

13. 100.0g of $KClO_3$ was added to 40.0 cm³ of water to give a saturated solution at 298K. If the solubility of the salt is 20.0 mol dm^{-3} at 298K, what percentage of the salt is left undisolved? [K 39, Cl = 35.5, O = 16] A. 80% B.60% C. 5% D. 2%

14. A tertiary amine is A. ethylamine B. diethylamine C. triethylamine

D. tetraethylarnine

15. Which of the following statements is true when sulphur atom forms its ion? A. It achieves an inert configuration B. It transfers two electrons in the process C. It accepts one electron in the process D. It gets oxidized in the process

16. An electron described by the quantum number, n = 4, $\mathcal{L}$ = 3 can be located in what orbital?
    A. 4f B. 3s C. 3d D. 4p

17. An aqueous solution of a crystalline salt reacts with dilute HCl to give a yellow precipitate and a gas that turned dichromate paper green. The crystalline salt may be, A. $Na_2S_2O_3.5H_2O$. B. $Na_2CO_3.10H_2O$ C. Na_2S. D. $NaHCO_3$

18. The oxidation states of nitrogen in ammonium nitrate are, A. -3, +3 B.+3, +5 C. +3, -5 D. -3, +4

19. Which of these reagents can confirm the presence of a triple bond?
    A. Hypochlorous acid B. Bromine water
    C. Acidified $KMnO_4$ D. Copper I chloride

20. An excess 0.10 mol dm³ HCl was poured into a big beaker containing 2g of limestone. The unreacted acid required 25cm³ of 0.10moldm⁻³ potassium carbonate to neutralize it. What was the original volume of the acid? [Ca = 40, C = 12, O = 16] A. 250 cm³ B. 260 cm³ C. 400 cm³ D. 450 cm³

21. $^{226}_{88}Ra \rightarrow\ ^{x}_{86}Rn + \alpha - particle$. What is the value of x in the nuclear reaction? A. 226 B. 220 C. 222 D. 174

22. In the electrolysis of copper (II) sulphate using copper electrodes, the processes that occur at the anode and cathode respectively are A. dissolution and evolution B. dissolution and deposition C. deposition and evolution D. evolution and deposition

SOLUTION TO CHEMISTRY 2011
1. A 2.C 3.B 4.A 5.A 6.C 7.A 8.C 9.B 10 A 11.D 12.D 13.D 14.C 15.A 16.A 17.C 18.B 19. D 20.D 21.C 22.C 23.B

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2010 POST-UTME SCREENING EXERCISE CHEMISTRY

1. Whose experiment showed that the atom has a tiny positively charged nucleus? (a) Thompson (b) Rutherford (c) Millikan (d) Dalton

2. Which of the quantum number divides shells into orbitals? (a) principal (b) subsidiary (c) magnetic (d) spin

3. Which of these statements is/are correct of a proton?
   i. The mass of a proton is one-twelfth the molar mass of carbon
   ii. The mass of a proton is 1840 times the mass of an electron iii. The mass of a proton is 1.0008g.
   (a) ii only (b) i, ii and iii (c) i only (d) and ii only.

4. Candidate devised the following for the separation of the components of some mixtures.
   i. Components of ink; principles involved is chromatography ii. Components of water and kerosene principle involved is separating funnel.
   iii. Components of iodine and sodium chloride, principles involved is sublimation.
   In which of the above is the principle used correct? (a) i only (b) ii only (c) i only (d) i, ii, & iii

5. Which of the following procedures will separate a mixture of sand, sodium chloride and iodine into its components? (a) add water; filter; sublime; evaporate to dryness (b) add water; sublime; filter; evaporate to dryness (c) sublime; filter; add water; evaporate to dryness (d) sublime; add water filter; evaporate to dryness

6. The type of bonds in ammonium chloride are (a) Covalent and electrovalent (b) dative and covalent (c) dative and electrovalent (d) covalent, dative and electrovalent

7. Which of the following types of bonding does not produce a compound? (a) ionic bonding (b) covalent bonding (c) dative bonding (d) metallic bonding

8. The combining powers of HCO_3^-; O^{2-}; Na^+; Cl^-; respectively are: (a) $-2, +1, -1, +1$ (b) $1, 2, 1, 1$ (c) $+1, -2, +1, -1$ (d) None of these

9. What is the chemical formula of the compound containing: 6.02×10^{23} atoms of Hydrogen, 35g of chlorine, and 4 moles of oxygen atoms? (a) HCl_4O (b) $HClO$ (c) $HClO_4$ (d) HCl_2O_4

10. 200cm³ of hydrogen were collected over water at 30^0C and 740mmHg. Calculate the volume of the gas at s.t.p. if the vapour pressure of water at the temperature of the experiment is 14mmHg. (a) 168.25cm³ (b) 176.40cm³ (c) 185.46cm³ (d) 172.14cm³

11. A given mass of gas occupies a certain volume at 300K. At what temperature will its volume be double? (a) 400K (b) 480K (c) 550K (d) 600K

12. The basic assumption in the kinetic theory of gas that: "forces of attraction and repulsion between gaseous molecules are negligible" implies that: (a) molecules will continue their motion indefinitely (b) gases will occupy any available space (c) gases can be compressed (d) none of the above

13. Which of the following is true of a sample of hydrogen gas whose mass is 4.00g under a pressure of 2atm and a temperature of 27°C? [H =1, R=0.082 lit atm. Mol⁻¹ k⁻¹] (a) Its volume is 24.6 litres (b) It contains 6.02 x 10²³ molecules (c) It exists as atoms because of temperature (d) None of the above.

14. The following are chemical entities identifiable during qualitative analysis i SO_4^{2-} ii H_3O^+ iii NH_4^+ iv OH^- Which of them can be detected by litmus paper? (a) ii & iv only (b) ii only (c) i & iii only (d) iv only

15. i $NaHCO_3$ ii $NaHSO_4$ iii $NaCl$. Which of these will dissolve in water to give alkaline solution? (a) i, ii & iii (b) ii only (c) i only (d) i & ii only

16. Burning of 0.46g of ethanol produced heat that raised the temperature of 100g of water by 30°C. Calculate the heat of combustion of ethanol, C_2H_5OH. (C = 12; H 1; 0 = 16) (a) 50 KJmol⁻¹ (b) 900 KJmol⁻¹ (c) l200 KJmol⁻¹ (d) 1000 KJmol⁻¹

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17. When chlorine is bubbled into potassium iodine solution: (a) a white precipitate is seen (b) reddish brown colour develops (c) solution remains colourless (d) blue colour is seen

18. $PCl_{5(g)} \rightarrow PCl_{3(g)} + Cl_{2(g)}$ In the reaction above, an increase in pressure will (a) decelerate the reaction (b) Increase the yield of PCl_3 (c) increase the yield of PCl_5 (d) accelerate the reaction

19. A saturated solution of silver trioxocarbonate (IV), was found to have concentration of 1.30 x 10^{-5} moldm^{-3}. The solubility product of the trioxocarbonate (IV) is (a) 8.79 x 10^{-15} (b) 1.69 x 10^{-10} (c) 1.82 x 10^{-11} (d) 9.84 x 10^{-10}

20. A Zinc half-cell is connected to an iron half-cell through a salt bridge and both are also connected through a copper wire. At which electrode is reduction taking place and which electrode is positively charged? (a) Zinc, zinc (b) Iron, iron (c) Zinc, Iron (d) Iron, Zinc

21. Which of the following is the difference between an electrolytic cell X and electrochemical cell Y. (a) Anode in X is -ve while anode in Y is +ve (b) In X, oxidation takes place at the anode while in Y reduction takes place at the anode. (c) In X, anode is positive while in Y anode is negative (d) In X, chemical energy is converted into electrical energy while in Y electrical energy is converted into chemical energy.

22. What mass of bromine will saturate completely 6.8g of 3-methybut-1-yne [H = 1; C = 12; Br = 80] (a) 16g (b) 32g (C) 12g (d) 24g

23. 100cm^3 of oxygen and 10cm^3 of butane measured at room temperature and pressure were mixed and exploded. Determine the volume of the mixture when brought back to the original conditions of measurements. (a) 125 cm^3 (b). 110 cm^3 (c) 75cm^3 (d) none of these

24. Sulphur (a) forms two alkaline oxides (b) is spontaneously inflammable (c) bums with a blue flame (d) conducts electricity in the molten state

25. Which of the following combination of reagents will react to give chlorine gas? (a) Sodium chloride, conc H_2SO_4 and Manganese(IV) oxide (b) Potassium tetraoxomangate (vii) and conc. H_2SO_4 (c) Potassium trioxochlorate (v) and conc. H_2SO_4 (d) Potassium tetraoxomangate (Vl) and conc H_2SO_4

SOLUTION TO CHEMISTRY 2010
1.B 2.B 3.A 4.D 5.D 6.D 7.D 8.B 9.C 10.D 11.D 12.B 13.A 14.A 15.C 16.No correct option 17.B 18.C 19.A 20.B 21.C 22.B 23.C 24.C 25.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE. 2009 POST-UME SCREENING EXERCISE - CHEMISTRY

1. The flame used by welders in cutting metals is (a) butane gas flame (b) acetylene-hydrogen flame (c) kerosene flame (d) oxy-acetylene flame (e) oxygen flame

2. Consecutive members of an alkane homogenous series differ by (a) CH (b) CH_2 (c) CH_3 (d) C_3H_3 (e) C_nH_{2n+2}

3. Which of these will dissolve in HCl? Mg, Fe, Pb and Cu (a) all the metals (b) Mg, Fe and Cu (c) Mg ,Fe and Pb (d) Mg and Fe only (e) Mg only

4. Stainless steel is an alloy of (a) carbon, iron and copper (d) carbon, iron and silver (e) carbon and iron only

5. What volume of 0.50M H_2SO_4 will exactly neutralize 20cm^3 of 0.1M NaOH solution? (a) 2.0cm^3 (b) 5.0cm^3 (c) 6.8cm^3 (d) 8.3cm^3 (e) 10.4cm^3

6. A gas that can behave as a reducing agent towards chlorine and as an oxidizing agent toward hydrogen sulphide is (a) O_2 (b) NO (c) SO_2 (d) NH_3 (e) CO_2

7. An element that can exist in two or more different structural forms which possess the same chemical properties is said to exhibit (a) polymerism (b) isotropy (c) isomorphism (d) isomerism (e) allotropy

8. The hybridization of the carbon atom in ethyne is (a) SP^a (b) SP^3 (c) SP^2 (d) SP (e) ES

9. In the Haber process for the manufacturer of ammonia, finely divided iron is used as (a) an ionizing agent (b) a reducing agent (c) a catalyst (d) a dehydrating agent (e) an oxidizing agent

10. Nitrogen can best be obtained from a mixture of oxygen and nitrogen by passing the mixture over (a) potassium hydroxide (b) heated gold (c) heated magnesium (d) heated phosphorus (e) calcium chloride

11. At STP how many litres of hydrogen can be obtained from the reaction of 500cm^3 of 0.5M H_2SO_4 excess zinc metal (a) 22.4dm^3 (b) 11.2dm^3 (c) 65dm^3 (d) 5.6dm^3 (e) 6.00dm^3

12. Tetraoxosulphate (VI) ions are final test using (a) acidified silver nitrate (b) acidified barium chloride (c) lime water (d) dilute hydrochloric acid (e) acidified nitrate

13. Which of the following is NOT the correct product formed when the parent metal is heated in air? (a) calcium oxide (CaO) (b) sodium oxide (Na_2O) (c) Copper (II) oxide (CuO) (d) triiron tetraoxide (Fe_3O_4) (e) Aluminum oxide (Al_2O_3)

14. Which of the following roles does sodium chloride play in soap preparation? It (a) reacts with glycerol (b) purifies the soap (c) accelerates the decomposition of the fat and oil (d) separates the soap from the glycerol (e) converts the fat acid to its sodium salt

15. The function of Sulphur during the vulcanization of rubber is to (a) act as catalyst for the polymerization of rubber molecules (b) convert rubber from thermosetting to thermoplastic polymer (c) from chains which bind rubber molecules together (d) break down rubber polymer molecule (e) shorten the chain length of rubber polymer

16. An element with atomic number twelve is likely to be (a) electrovalent with a valency of 1 (b) electrovalent with a valency of 2 (c) covalent with a valency 2 (d) covalent with a valency of 4

17. Which of the following is an acid salt? (a) $NaHSO_4$ (b) Na_2SO_4 (c) CH_3CO_2Na (d) Na_2S_2 (e) C_2H_5

18. Which of the following compounds is NOT formed by the action of chlorine on methane? (a) CH_3Cl (b) C_2H_5Cl (c) CH_2Cl_2 (d) $CHCl_3$ (e) CH_4Cl

19. Starch can be converted to ethyl alcohol by (a) distillation (b) fermentation (c) isomerization (d) cracking (e) osmosis

20. How many isomers can be formed from organic compounds with the formula C_3H_8O (a) 2 (b) 3 (c) 4 (d) 5 (e) 1

21. When platinum electrodes are used during the electrolysis of copper (II) tetraoxosulphate (IV) solution, the solution gets progressive (a) acidic (b) basic (c) neutral (d) atmospheric

22. Which of the following physical properties decreases across the periodic table (a) ionization potential (b) electron affinity (c) electronegativity (d) atomic radius (e) electropositive reaction

23. Which of these has the lowest pH value? (a) calcium trioxocarbonate (IV) (b) sodium trioxocarbonate (IV) (c) hydrochloric acid (c) ethanoic acid (e) hydrocarbon acid

24. Which of the following is used in fire extinguishers? (a) Carbon (II) oxide (b) carbon (IV) oxide (c) Sulphur (IV) oxide (d) ammonia (e) Sulphur (III) oxide.

25. Mortal is NOT used for under water construction because (a) it hardens by loss of water (b) its hardening does not depend upon evaporation (c) it requires concrete to harden (d) it will be washed away by the flow of water (e) it softens when exposed.

SOLUTION TO CHEMISTRY 2009
1. D 2.B 3.C 4.No correct option 5.A 6.C 7.E 8.D 9.C 10.D 11.D 12.D 13.B 14.D 15.C 16.B 17.A 18.E 19.B 20.D 21.A 22.D 23.C 24.B 25.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2008 POST-UME SCREENING EXERCISE - CHEMISTRY

1. Silver trioxonitrate (V) on heating, gives (a) Ag, N_2O and O_2 (b) Ag_2O, N_2 and O_2 (c) Ag_2O and N_2O (d) Ag, NO_2 and O_2

2. The most reactive halogen is: (a) Cl_2 (b) Br_2 (c) F_2 (d) I_2

3. 0.79g of a gas as s.t.p occupied a volume of 250cm³. What is the relative molecular mass of the gas? [G.M.V. at s.t.p = 22.4dm³] (a) 17 (b) 32 (c) 64 (d) 71

4. The relationship between the density (d) of a gas and the rate (r) at which the gas diffuses is (a) $r = Kd$ (b) $r = Kd^{-1/2}$ (c) $r = Kd^{1/2}$ (d) $r = Kd^{-1}$

5. The pressure exerted by a sample of a gas confined in 5.86dm³ container at 20°C is 4.1atm. What is the number of moles of the gas in the sample? [R = 0.082dm³ atm mol⁻¹ K⁻¹] (a) 1.00 (b) 2.00 (c) 3.00 (d) 4.00

6. 50cm³ of hydrogen are sparked with 100cm³ of oxygen at 110°C and 1atm. If the whole reaction mixture passes through an alkaline solution of pyrogallol, the volume of the residual gas is (a) 125cm³ (b) 100cm³ (c) 75 cm³ (d) 50cm³

7. Inter-atomic combination involves the (a) neutrons in the nucleus only (b) protons in the nucleus only (c) electrons in the outer shell only (d) electrons in all the shells.

8. Which of the following is not a characteristics property of ionic compounds? (a) solubility in polar solvents (b) low melting points (c) conduction of electricity in aqueous solution (d) fast reactions in solution

9. The compound with the highest ionic character among the following is (a) PCl_5 (b) CCl_4 (c) BCl_3 (d) $CsCl$

10. Why is the hydrogen gas not found in the atmosphere? It readily reacts with (a) carbon (IV) oxide (b) Oxygen (c) Nitrogen (d) carbon (II) oxide

11. Apart from water, the other product(s) of the neutralization reaction between NaOH solution and nitrogen (IV) oxide is/are (a) $NaNO_2$ (b) $NaNO_3$ (c) $NaNO_3$ and HNO_3 (d) $NaNO_2$ and $NaNO_3$

12. An acid and its conjugate base (a) are oppositely charged (b) differ only by a hydroxide ion (c) differ only by an electron (d) differ only by a proton

13. A complex salt is (a) $KAl(SO_4)_2.12H_2O$ (b) $Cu(NH_3)_4Cl_2$ (c) $K_2S_2O_3.5H_2O$ (d) $Mg(OH)Cl$.

14. What happens to the conductivity of an electrolyte as its concentration reduces? (a) increases (b) decreases (c) is unaffected (d) becomes resistivity

15. If the cost of electricity required to deposit 1g of Aluminium is N4.00, how much would it cost to deposit 24g of copper? [A = 27, Cu = 64] (a) ₦27.02 (b) ₦37.02 (c) ₦47.02 (d) ₦57.02

16. The overall reaction in an electrochemical cell is
$Mg_{(s)} + Cu^{2+}_{(aq)} \rightarrow Mg^{2+}_{(aq)} + Cu_{(s)}$
What is the symbolic representation of the cell?
(a) $Mg_{(s)}/Mg^{2+}_{(aq)} \parallel Cu^{2+}_{(aq)}/Cu_{(s)}$ (b) $Mg_{(aq)}/Mg^{2+}_{(s)} \parallel Cu^{2+}_{(s)}/Cu_{(aq)}$
(c) $Cu^{2+}_{(aq)}/Cu_{(s)} \parallel Mg_{(s)}/Mg^{2+}_{(aq)}$
(d) $Cu_{(s)}/Cu^{2+}_{(aq)} \parallel Mg^{2+}_{(aq)}/Mg_{(s)}$

17. Which of the following metals can be used as sacrificial cathode for preventing corrosion of a length of iron pipe? (a) Ag (b) Cu (c) Mg (d) Mn

18. A particle that contains 8 protons, 9 neutrons and 7 electrons could written as (a) $^{16}_8O$ (b) $^{17}_8O^+$ (c) $^{17}_9O^+$ (d) $^{17}_8O$

19. The decreasing order of the magnitude of energy changes is (a) phase, chemical, nuclear (b) chemical, nuclear, phase (c) nuclear, phase, chemical (d) nuclear, chemical, phase

20. 0.92g of ethanol raised the temperature of 100g of water from 298K to 312.3K when burned completely. What is the heat of combustion of ethanol? (a) +300KJ mol⁻¹ (b) +3000KJ mol⁻¹ (c) -300KJ mol⁻¹ (d) -3000KJ mol⁻¹ [C = 12; H = 1; O = 16; specific heat capacity of water = 4.2Jg⁻¹ K⁻¹]

21. The highest level of molecular disorderliness is found in (a) ice at -10°C (b) water at 100°C (c) steam at 100°C (d) ice at 0°C

22. A reaction is spontaneous at all temperature if (a) $\Delta G = 0$ (b) $\Delta G > 0$ (c) $\Delta S < 0$ and $\Delta H > 0$ (d) $\Delta S > 0$ and $\Delta H < 0$

23. Which of the following reactions of marble with $100cm^3$ of $0.100moldm^{-3}$ HCl is fastest? (a) 5g of marble lump at 50^oC (b) 5g of marble powder at 50^oC (c) 5g of marble powder at 25^oC (d) 5g of marble lump at 25^oC

24. $A_{(g)} + 2B_{(g)} \rightarrow C_{(g)}$ In the reaction represented by the equation above, the rate of appearance of C is found experimentally to be independent of the concentration of A and to increase four folds when the concentration of B is doubled. The rate law for the reaction is (a) Rate $= K[A]^0[B]^4$ (b) Rate $= K[A]^0[B]^2$ (c) Rate $= K[A][B]^2$ (d) Rate $= K[A]^2[B]^0$

25. How is the equilibrium constant for the forward reaction of an equilibrium (K_f) related to that of the reverse reaction (K_r)? (a) (K_r) is the additive inverse of (K_f) (b) (K_r) is the multiplicative inverse of (K_f) (c) (K_r) is the same as (K_f) (d) the product of (K_r) and (K_f) is zero.

26. What is the concentration of OH ions of an aqueous solution of pH 4.4? (a) 9.600×10^{-10} $moldm^{-3}$ (b) $2.512 \times 10^{-10}moldm^{-3}$ (c) 9.600×10^{10} $moldm^{-3}$ (d) 2.512×10^{10} $moldm^{-3}$

SOLUTION TO CHEMISTRY 2008
1. D 2.C 3.D 4.B 5.A 6.D 7.C 8.B 9.D 10.B 11.D 12.D 13.B 14.B 15.A 16.A 17.C 18.B 19.D 20.C 21.C 22.C 23.B 24.B 25.B 26.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE 2007 POST-UME SCREENING EXERCISE - CHEMISTRY

1. Consider the reaction:
$2A_{(g)} \rightleftharpoons B_{(g)} + C_{(g)}$ $\Delta H = +25.6$ kJ. Which of the following changes will favour the formation of the products of the reaction represented above, at equilibrium? (a) decrease in temperature (b) increase in pressure (c) increase in temperature (d) decrease in volume

2. An element $^{226}_{88}X$ undergoes radioactive decay by emitting two alpha particles and a beta radiation. Which of the following nuclei correctly describe the product formed by the reaction? (a) $^{222}_{89}T$ (b) $^{218}_{84}S$ (c) $^{218}_{85}R$ (d) $^{227}_{87}Q$

3. Which of the following Alkanols will not undergo oxidation reaction by acidified $K_2Cr_2O_7$?
(a) $CH_3CH_2CH(OH)CH_3$
(b) $CH_3CH_2CH_2CH_2OH$
(c) $CH_3CH_2CH_2C(CH_3)(OH)CH_3$
(d) None of the above

4. The electronic configuration of the species underlined as in the molecule H$_2$S is
(a) $1s^22s^22p^63s^23p^63d^{10}4s^24p^4$
(b) $1s^22s^22p^63s^23p^4$
(c) $1s^22s^22p^63s^23p^2$
(d) $1s^22s^22p^63s^23p^6$

5. The functional group(s) of an amino acid is/are (a) NH$_2$, -COOH (b) C_nH_{2n+1}, -COOH (c) –COCl, COOH (d) COOH, CONH$_2$

6. A student while trying to identify two gases labeled A and B, found that gas A is acidic to litmus paper and turn acidified potassium dichromate solution green, while gas B turns red litmus paper blue and forms dense white fume with hydrogen chloride. The correct identity of A and B respectively are (a) CO_2 and N_2 (b) SO_2 and NH_3 (c) HCl and NH$_3$ (d) NO_2 and PCl_5

7. Which of the following titrations will have a solution with a pH greater than 7 at the end point (equivalent point) of the titration (a) titration of sodium hydroxide with tetraoxosulphate (VI) acid (b) titration of sodium trioxocarbonate (IV) with hydrochloric acid (c) titration of sodium hydroxide with oxalic acid (ethanedioic acid) (d) titration of ammonium hydroxide and trioxonitrate (V) acid.

8. $70cm^3$ of hydrogen are sparked with $25cm^3$ of oxygen at S.T.P. The total volume of the residual gas is (a) $20cm^3$ (b) $35cm^3$ (c) $45cm^3$ (d) $25cm^3$

9. A solution X, on mixing with $AgNO_3$ solution, gives a white precipitate soluble in NH_3. A solution Y when added to X, also gives a white precipitate which is soluble on boiling. Solution Y contains (a) Ag+ (b) Pb^{2+} (c) Pb^{4+} (d) Zn^{2+}

10. Which of the following statement is an exception in the assumptions of the kinetic theory of gases? (a) The particles are of negligible size (b) the particles are in constant random motion (c) the particles are of negligible mass (d) the particles collide with each other.

11. A saturated solution of AgCl was found to have a concentration of 1.30×10^{-5} $moldm^{-3}$. The solubility product of AgCl therefore is (a) 1.30×10^{-5} $mol^2 dm^{-6}$ (b) 2.60×10^{-12} mol^2dm^{-6} (c) 1.30×10^{-7} $mol^2 dm^{-6}$ (d) $1.69 \times 10^{-10}mol^2 dm^{-6}$

12. 0.06g of a hydrocarbon occupies $32cm^3$ at S.T.P. Its formula is (a) C_3H_6 (b) C_2H_2 (c) C_2H_4 (d) C_2H_6

13. Consider the following compounds
(i)$CH_3CH_2C(CH_3)_2CH_2CH_3$
(ii)$CH_3CH_2CH_2CH_3$
(iii)$CH_3CH(CH_3)C(CH_3)_2CH_3$
(iv)$CH_3CH(CH_3)CH_3$.
The correct arrangement of the compounds in their increasing order of volatility is (a) iv, ii, i, iii (b) iii, i, ii, iv (c) ii, i, iii, iv (d) iii, i, iv, ii

14. Which of the following is a redox reaction? (a) $2HNO_2 + 2HI \rightarrow 2H_2O + 2NO + I_2$ (b) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ (c) $BaCI_2 + 2AgNO_3 \rightarrow AgCI + Ba(NO_3)_2$ (d) $4FeO + O_2 \rightarrow 2Fe_2O_3$

15. Which of the following processes leads to increase in entropy? (a) mixing of a sample of NaCl and sand (b) condensation of water vapour (c) boiling of a sample of water (d) cooling a saturated solution

16. Which one of the following statements is true? (a) Most of solids have low densities (b) most gases are ionic compounds (c) solids, like liquids and gases, do not have fixed shapes and fixed volumes (d) gases do not have their own shape but rather expand to fill the shapes of their containers uniformly.

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17. A liquid begins to boil when (a) its volume is slightly decreased (b) its vapour pressure is lower than the external pressure (c) its vapour pressure equals the external pressure (d) its molecules start escaping from the surface.

18. An element which exists in more than one crystalline form is said to exhibit (a) polymorphism (b) isotopy (c) allotropy (d) isomerism

19. Which of the following is an example of a chemical change? (a) freezing of water (b) dissolution of NaCl in water (c) rusting of iron (d) separating a liquid mixture by distillation

20. The electronic configuration in the ground state of the chloride ion (Cl^-) is (a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$ (b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$ (c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^7$ (d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^8$

21. The oxidation number of oxygen in BaO_2 is (a) -2 (b) -4 (c) -1 (d) 0

22. Which ONE of the following statements is true for the p-block elements? (a) electro-negativity increases as we go down a group (b) electro-negativity increases regularly from left to right across a period (c) electro-negativity decreases regularly from left to right across a period (d) electro-negativity remains almost constant across a period.

23. The general formula for carboxylic acids is

(a) $R\text{-}C\text{-}OR^1$ with O double bond
(b) $R\text{-}C\text{-}O\text{-}C\text{-}R^1$ with O double bonds
(c) $R\text{-}C\text{-}OH$ with O double bond
(d) $R\text{-}C\text{-}R^1$ with O double bond

24. The functional group represented in the compound $CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH=O$ is (a) Alkanone (b) Alkanal (c) Alkanol (d) Alkanoate

SOLUTION TO CHEMISTRY 2007

1. C 2.C 3.C 4.D 5.A 6.B 7.C 8.A 9.B 10C 11.C 12.A 13.No correct option 14.A 15.C 16.D 17.C 18.C 19.C 20.A 21.C 22.B 23.C 24.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2006 POST-UME SCREENING EXERCISE- CHEMISTRY

1. A 512cm³ sample of a gas weighed 1.236g at 20ºC and a pressure of one atmosphere. The relative molecular mass of the gas is [R = 8.314JK⁻¹ mol⁻¹; 1 atm = 101,325 J m⁻³] (a) 58.07 (b) 588,367 (c) 5.88 (d) 197.9

2. The amount of methane molecules, CH_4 in 8.0 grams of methane is (a) 8mol (b) 128mol (c) 0.5mol (d) 3.01×10^{23}mol

3. The concentration of a solution obtained by dissolving 0.53g of pure anhydrous Na_2CO_3 in water to make 250 cm³ of solution is (a) 2.0×10^{-5} moldm⁻³ (b) 2.1 g dm⁻³ (c) 2.0×10^{-2} moldm⁻³ (d) 5.0×10^{-3} moldm⁻³

4. What is the maximum volume of CO_2 at s.t.p. that can be obtained when dilute hydrochloric acid is added to10 grams of $CaCO_3$? [Ca = 40, C = 12, O = 16] (a) 2.24dm³ (b) 22.4dm³ (c) 0.224dm³ (d) 22.4cm³

5. Sulphur (IV) oxide travels a given distance in 10 sec. How long will it take equal volume of Helium to travel the same distance under the same conditions? [S = 32, O = 16, He = 4] (a) 1.6sec (b) 40 sec (c) 5.0sec (d) 2.5sec

6. The volume of hydrogen gas produced at S.T.P. when 100ml of 2M hydrochloric acid reacts with excess zinc is; (a) 2.24dm³ (b) 4.48dm³ (c) 1.12dm³ (d) 44.8dm³

7. All the following will liberate a gas when reacted with dilute hydrochloric acid except (a) sodium tetraoxosulphate (VI) salt (b) Sodium trioxocarbonate (IV) salt (c) Sodium sulphide (d) Sodium trioxonitrate (V)

8. The isomer of a compound C_5H_{10} which does NOT decolourise bromine water is (a)2-methylbut-2-ene (b)3-dimenthyl methylbut-2-ene (c) 2-methylbut-l-ene (d) methylcyclobutane

9. A mixture of Nitrogen, Oxygen and Helium contains 0.25, 0.15 and 0.4 mole of these gases respectively. If the pressure contribution due to oxygen was 2.5atm. The partial pressure of Helium is (a) 4.0 atm (b) 0.8atm (c) 3.33atm (d) 6.67atm

10. Elements P has an atomic number of 12 while element Q has an atomic number 15. Combination of P and Q gave a compound P_mQ_n. The respective values of m and n are (a) 2 and 2 (b) 2 and 3 (c) 3 and 2 (d) 2 and 1

11. $C_xH_y + 9O_2 \rightarrow 6CO_2 + 6H_2O$ The hydrocarbon, C_xH_y, in the reaction above is most likely (a) an alkane (b) a benzene (c) an alkene (d) alkyne

12. During electrolysis, two cells each containing molten Al_2O_3 and fuse $CaCl_2$ were connected in series. A current of 15 Amp was passed through the cells for a given period of time. At the end of the electrolysis 9g of calcium was found to have been deposited at the cathode what mass of Aluminium would be deposited in the second cell. [Al = 27, Ca = 40] (a) 8.82g (b) 4.44g (c) 17.60g (d) 4.05g

13. The balanced equation for the reaction of Tin (ii) salt with potassium heptaoxodichromate (VI) in an acidic medium can be represented as $eSn^{2+} + fCr_2O_7^{2-} + gH^+ \rightarrow hSn^{4+} + iCr^{3+} + jH_2O$, e,f,g,h,i, and j are respectively. (a) 3,5,6,3,1, and 4 (b) 3,1,14,3,2 and 7 (c) 3,2,6,1,5 and 6 (d) 5,2,1,5,3 and 2

14. The pH of a solution containing 0.5×10^{-6} MH_2SO_4 is (a) 6.3 (b) 6.5 (c) 6.0 (d) 5.0

15. Which of the following oxides will NOT dissolve in both dilute hydrochloric acid and 2M Sodium hydroxide solution? (a) Lead (II) oxide (b) Aluminium oxide (c) Zinc (II) oxide (d) Calcium oxide

16.
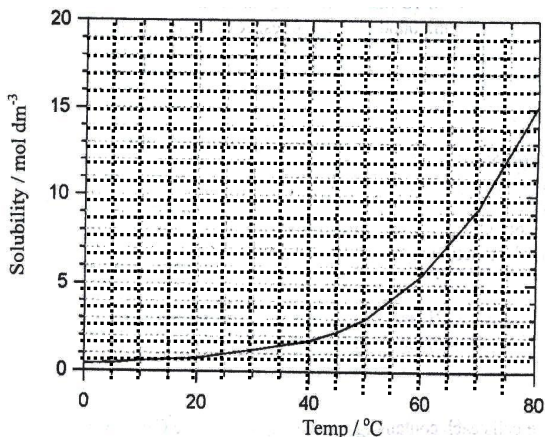
The curve above represents the solubility curve of $KClO_3$. The number of moles of $KClO_3$ crystals produced by cooling $200cm^3$ of a saturated solution of the salt from $65°C$ to $25°C$ is (a) 6.30mole (b) 1.26mole (c) 0.63mole (d) 7.30mole

17. During a compression process involving an ideal gas at pressure P_1, when the volume, V_1 of the gas was halved, the temperature in Kelvin increases by half its initial value. The final pressure P_2 is given by (a) $3P_1$ (b) $12P_1$ (c) $6P_1$ (d $1.5P_1$

18. The I.U.P.A.C. name for the compound
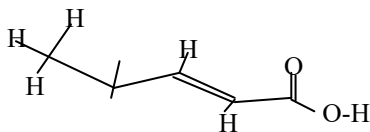
is (a) pent-3-enoic acid (b) pent-4-enoic acid (c) pent-2-enoic acid (d) pent-3-ene-l-oic acid

19. Metal salts of long chain fatty acids are known as (a) detergents (b) double salts (c) soaps (d) grease

$$CH_3\text{-}\underset{\overset{\|}{O}}{C}\text{-O-}CH_2CH_2CH_3$$

$$\underset{\overset{\|}{O}}{CH_3\text{-}}$$
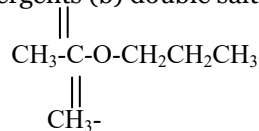
20. The compound, when refluxed with dilute HCl, is hydrolyzed to give (a) CH_3COOH and $CH_3CH_2CH_2OH$ (b) CH_3COOH and $CH_3CH_2CH_3$ (c) CH_3COOH and CH_3CH_2OH (d) CH_3COOH and $CH_3CH_2CH_2Cl$

21. The compound is the product of oxidation of (a) butan-3-01 (b) butan-1-01 (c) 3-methylpropan-2-01 (d) butan-2-01

22. Which of the following structural formulas is NOT isomeric with the others? (a) $CH_3CH_2CH_2CH_2\text{-OH}$
(b) $CH_3\text{-O-}CH_2CH_2CH_3$
(c)

(d) $H_3C - \underset{\overset{|}{OH}}{C}\text{- CH- }CH_2CH_3$
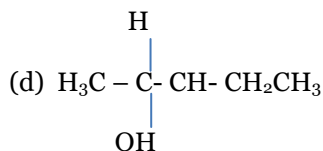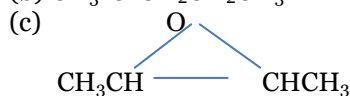
23. Cellulose and starch can be classified as one of the following (a) hydrocarbons (b) sugars (c) carbohydrates (d) alkaloids

SOLUTION TO CHEMISTRY 2006
1.A 2.D 3.C 4.A 5.D 6.A 7.A 8.D 9.D 10.C 11.C 12.D 13.B 14.C 15.D 16.B 17.A 18.C 19.C 20.A 21.D 22.C 23.C

1. Which of the following is not present in RNA? (a) Adenine (b) Guanine (c) Cytosine (d) Thymine

2. In the evolutionary trend, in which phylum do we begin to see a complete digest tract? (a) ctenophora (b) Platyhelminthes (c) nematoda (d) mollusca.

3. The picture below is an example of a (a) capsule (b) follicle (c) legume (d) schizocarp.


4. One of these features is not typical of most animals (a) heterotrophic (b) multicellular (c) sessile (d) motile at some stage of life cycle.

5. The cnidarians use their nematocysts only for _____ (a) capturing prey (b) courtship (c) gas exchange (d) sensing chemicals.

6. The lack of special supportive structures in bryophytes restricts them to one of the following types of growth. (a) lateral growth (b) upward growth (c) downward growth (d) aerial growth.

7. Which type of placentation does the diagram below represent?

(a) parietal (b) axile (c) marginal (d) free-central.

8. One of these is not a unique feature of meiosis (a) synapsis (b) homologous recombination (c) reduction division (d) cytokinesis.

9. One of the following is not true (a) saprophytic nutrition involves feeding on a soluble organic material from inorganic substances (b) symbiosis is a nutritional relationship in which both organisms involved derive benefit (c) a parasite causes injuries to its host in the course of getting its food (d) holozoic mode of nutrition can be seen in animals carnivorous plants and some protists.

10. In which biome would you expect to have the shortest growing season? (a) tropical rain forest (b) guinea savanna (c) sudan savanna (d) deserts.

11. The concept of tropic structure of a community emphasizes (a) the dominant form of vegetation (b) the main predator (c) the feeding relationship within a community (d) the richness of species in the community.

12. If a human skin cell with 46 chromosomes divide by mitosis, how many chromosomes will each daughter cell have? (a) 23 (b) 12 (c) 46 (d) 92.

13. Example of genetic diseases include any of the following except _____ (a) diabetes (b) cystic fibrosis (c) hepatitis (d) epilepsy.

14. In his theory of evolution, Darwin identified _____ as the main cause of natural selection (a) physiological pressure (b) ecological pressure (c) environmental pressure (d) biological pressure.

15. Absorption is maximum in the small intestine because of _____ (a) the presence of villi (b) its length (c) its thin walls (d) all the above.

16. One of these is an agency responsible for conserving natural resources in Nigeria (a) PDP (b) NCF (c) ACC (d) NEMA.

17. Which of these statements about succession is incorrect? (a) succession is a change of species composition, community structure and function over time and space (b) succession is usually set in motion by some sort of disturbance (c) succession is both directional and predictable (d) succession begins only on a bare ground.

18. What happens to a tadpole after 45 days old? (a) It becomes fully, mouth becomes wider, horny jaw disappears completely (b) it becomes fully grown, mouth becomes wider, tail disappears completely (c) it becomes fully grown, mouth becomes wider, external gill disappears completely (d) it becomes fully grown, mouth becomes wider, slit disappears partially.

19. Effect of air pollutant does not include _____ (a) formation of carboxyl haemoglobin (b) displacement of digested food (c) lowering plant yield (d) damage breathing organs.

20. Physical observable characteristics of an organism is called _____ (a) genotype (b) phenotype (c) allele (d) locus.

21. One of these organisms is not an Autotroph (a) spirogyra (b) zea mays (c) rhizobium (d) mushroom.

22. In the diagram below, the part labeled (a) is
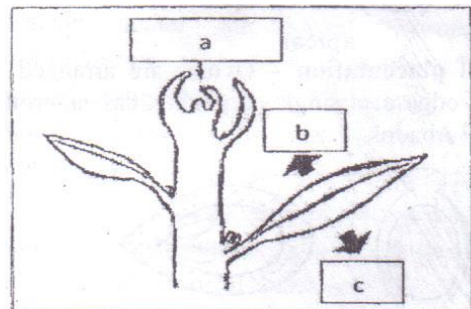
(a) apex (b) fruit (c) apical meristem (d) flower.

23. The condition in the diagram below is
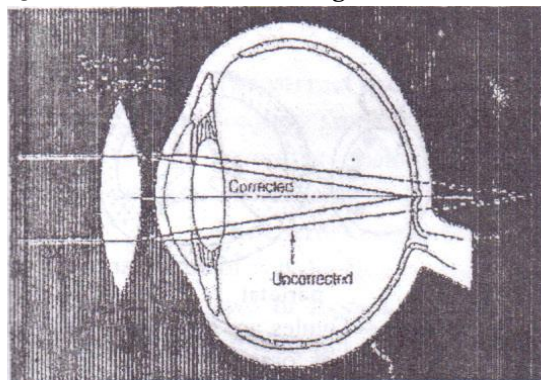
(a) hypermetropia (b) astigmatism (c) myopia (d) cataract.

24. In man, abnormality with chromosome 21 often lead to a genetic problem called _____ (a) respiratory syndrome (b) carcinoma syndrome (c) klinefeiter (d) down syndrome.

25. The presence of extensive amounts of rough endoplasmic reticulum in a cell is an indication that the cell in involved in _____ (a) synthesis and metabolism of CH_2O_3 (b) synthesis and secretion of proteins (c) synthesis of ATP (d) contraction.

ANSWERS TO BIOLOGY 2015
1. D 2. C 3.C 4.C 5.A 6.D 7.A 8. D 9.B 10.D 11.A 12.C 13.C 14.C 15.D 16.B 17.D 18.C 19.B 20.B 21.D 22.C 23.A 24.D 25. B

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2014 POST-UTME SCREENING EXERCISE
BIOLOGY

1. What type of lens is used in the spectacles of the people with this eye defect?
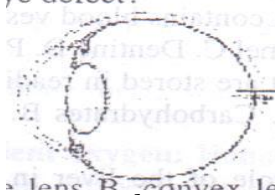
A. concave lens   B. convex lens   C. all of the options   D. none of the options

2. Which of these components of the phloem has its cytoplasm pushed to the sides while also lacking nucleus? A. Companion cell,   B. Sieve tube elements C. Sieve plate   D. Parenchyma

3. Which of the following statements about phylum Cnidaria is correct?   A. They are diplobastic animals.
B. Body is sac-shaped with three openngs C.They are bilaterally symmetrical.
D. They are triplobastic animals with two openings.

4. Which of these biological statements is incorrect? A. Reflex action are also known as involumtary actions

B. The forebrain consists of the cerebrum and the olfactory lobes
C. The right hemisphere of the brain controls the right half of the body
D. The outer part of the human cerebrum is made up of grey matter

5. The best known plant species that occur in fresh water swamp vegetation is
A. Rhizophora racemosa   B.Acrostichum aureum   C. Mitragyna ciliate   D. Triplochiton scleroxylon

6. Bacteria that live in the human intestine assist in the digestion and feed on nutrients the human consumed. This relationship might best be described as   A. Commensalism   B. Ectoparasitism
C. Endoparasitism   D. Mutualism

7. The xylem elements perform the function of transport but they also help to support plants because they
A. are internally located   B. are lubular   C. have rigid thick wall   D. Constantly absorb water

8. Biosphere is best described as
A. all parts of the earth where life exists.   B. the non-living parts of an ecosystem.
C. all component of an ecosystem   D. all the members of a single species in a habitat

9. Muscles fatigue is caused by ___ A. Accumulation of ethanol in the muscle cells B. Accumulation of methanol in the muscles cells C. Accumulation of lactic acid in the muscle cells D. Accumulation of pyruvic acid in the muscle

10. At what stag of the meiotic prophase do the homologous chromosomes attract each other and then pair up? A.Leptotene, B. Pachytene C. Zygotene D. Diplotene

11. Which of the organelles is not directly connected to cell division process? A. centromere
B. microtubules.   C. golgi bodies
D. spindle apparatus

12. During the light dependent reaction
A. glucose is formed   B. carbon IV oxide is fixed
C. NADPH and ATP are synthesized using electron released from water.
D. water is split and the electrons produced are used for glucose synthesis.

13. Meiosis II is similar to mitosis in that:
A. Homologous chromosome synapse
B. Sister chromatids separate during anaphase
C. The chromosome number is reduced
D. The daughter cells are diploid

14. The mechanisms of opening and closing the stomata is associated with the A. guard cells B. stoma C. lenticels D. air spaces

15. Holozioc is seen in   A. Animals, carnivorous plants and protozoans
B. Animals, prostist and carnivorous plants.
C. Animals, carnivorous plants and fungi
D. Animals, fungi and prostist

16. The part of the tooth that contains blood vessels and nerve fibres is A.Root B. Enamel
C. Dentine D. Pulp cavity

17. The food substances that are stored in readilness for time of food shortages are
A. Carbohydrates   B. Fats and Oils   C. Proteins   D. Vitamins

18. Which of these is the role of the liver in digestion?
A. Sythesis of lipase   B. Secretion of trypsin   C. Secretion of bile and bicarbonate for emulsification of fats.
D. Storage of bile for hydrolyses of starch.

19. Respiratory surfaces generally have the following characteristics with the exception of   A. it must be thick but permeable.   B. it must be moist
C. it must possess a large surface area
D. it must be richly supplied with blood vessels

20. Which of these is not a water soluble vitamin?
A. Thiamine   B. Riboflavin   C. Folic Acid   D. Calciferol

21. Which of these following biomes is currently being ravaged by desertification?   A. Derived savanna
B. southern Guinea savanna   C. Northern Guinea savanna   D. Sudan savanna

22. Which is the largest of the middle ear ossicles?
A. Anvil   B. Stipe   C. Hammer   D. Incus

23. The process by which plants and animals are modified in structure, physiology and behavior in order to survive is known as   A. Evolution   B. Adaptation   C. Succession   D. Aggregation

24. Which of thes plants can withstand extreme dryness?   A. Cactus   B. Raphia palm
C. Triplochiton scleroxylon   D. Parkie biglobosa

25. Animals that do not allow their body temperature to vary with the ambient are called?
A. Homoiothermic
B. Poikilothermic   C. Amphibians   D. Reptiles.

ANSWERS TO 2014 POST-UTME SCREENING EXERCISE BIOLOGY
1.B 2.B 3.A 4.C 5.B 6.C 7.D 8.C 9.C 10.C 11.C 12.C 13.C 14.A 15.A 16.D 17.A 18.C 19.A 20.D 21.B 22.C 23.C 24.A 25.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2013 POST-UME SCREENING EXERCISE - BIOLOGY

1. Which of these statements with respect to "individual organism" is most correct? (a) It refers to animals only (b) It refers to either the plants or animals (c) Its ecology can be carried out in zoo only (d) It is used in reference to plant only.

2. One of these is not a major biome in West Africa (a) Rain forest (b) Savanna (c) Coniferous forest (d) Mangrove

3. The media of transportation in living things include all but (a) Cytoplasm (b) Water (c) Eosin (d) Blood and lymph

4. Gaseous exchange through the lungs is called (a) cutaneous breathing (b) buccal breathing (c) pulmonary breathing (d) larynxial breathing

5. In saprophytic mode of nutrition (a) organisms feed on insoluble organic material (b) decomposition is not possible at all (c) nutrient recycling is possible (d) no animal is involved

6. A macro element which is not directly connected with formation of chlorophyll is (a) nitrogen (b) iron (c) magnesium (d) sulphur

7. During the light dependent reaction (a) glucose is formed (b) carbon IV oxide is fixed (c) NADPH and ATP are synthesized using electron released from water (d) water is split and the electrons produced are used for glucose synthesis.

8. Eutrophication refers to growth of (a) Bacteria (b) Fungi (c) Protophytes (d) Algae

9. All the following statements are consistent with the concept of trophic structure except (a) At every feeding stage some energy is wasted from the chain (b) The nearer the organism to the beginning of a food chain, the greater the available energy of the organism (c) The first trophic level is occupied by the autotrophs (d) There are few number of organisms at the start of a food chain.

10. All these statements about plants succession are correct except (a) Plant succession is the process of community change at one place over time (b) Plant succession is usually measured over the course of several years to hundred years (c) Succession proceeds from pioneer to climax phases (d) Succession is often not directional and so difficult to predict

11. Which of the followings is not true about finger print? (a) It is useful in detecting crime (b) No two individuals have the same finger print (c) It is a heritable character (d) It is environmentally induced

12. The factors for two pairs of contrasting characters are inherited independent of each other. This is (a) Mendel's first law of inheritance (b) Mendel's second law of inheritance (c) Mendel's law of segregation of germinal units (d) Mendel's law of independent pairing of germinal units

13. All of the following green algae are colonial forms except? (a) Gonium (b) Volvox (c) Pandorina (d) Anabaena

14. Allele is (a) an alternate form of a gene (b) a unit of inheritance (c) the position or location of the gene on a chromosome   (d) number of chromosomes in the gamete

15. One of these statements about sympathetic Nervous system is untrue (a) It stimulates many parts of the body in times of danger (b) It stimulates the heart beat (c) It functions like the adrenal glands (d) It lowers the blood pressure

16. One of the following elements is not associated with leaf chlorosis (a) Nitrogen (b) Iron (c) Calcium (d) Magnesium

17. Characteristics of continuous variation include all of the following except (a) Produced by many genes (b) Influenced by the environment (c) Occurs in a normal distribution curve (d) most of the organisms in the population fall at the tail ends of the range

18. Homeostasis is defined as (a) Regulation of both external and internal conditions of organisms (b) Maintenance of internal environment of an organism (c) Maintenance of internal and external environment of an organism (d)

Regulation of the chemical environment of an organism

19. Effectors are (a) muscles which work in response to the stimulus received from the motor nerves (b) glands which work in response to the stimulus received from the motor nerves (c) muscles or glands which work in response to the stimulus received from the motor nerves (d) efferent neurons

20. The mechanism of opening and closing the stomata is associated with the (a) guard cells (b) stoma (c) lenticels (d) air spaces

21. The part of the kidney where each tubule begins is called (a) Capsule (b) Cortex (c) Glomerulus (d) Urether

22. The number of cranial nerves that connect the brain to various parts of the body is (a) 10 pairs (b) 11 pairs (c) 12 pairs (d) 13 pairs

23. The following pair of ions is involved in transmission of impulses by neurons: (a) K and Na ions (b) Na and Mg ions (c) K and Cl ions (d) K and Ca ions

24. The probability of producing an heterozygote progeny in a cross between two heterozygote individuals of pea plant is (a) $\frac{1}{3}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) $\frac{2}{3}$

25. One of these does not protect the body from harmful effect of disease-causing micro-organisms (a) Anti toxin (b) Phagocytes (c) Antigens (d) Antibodies

ANSWERS TO BIOLOGY 2013
1.B 2.C 3.C 4.C 5.A 6.B 7.C 8.D 9.D 10.D 11.D 12.B 13.D 14.A 15.D 16.C 17.A 18.B 19.C 20.A 21.C 22.C 23.A 24.C 25.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2012 POST-UME SCREENING EXERCISE - BIOLOGY

1. One of the groups of organisms below is critical in the entire process of nutrient cycling (a) Aves (b) Nematoda (c) Mammalia (d) Fungi

2. Hierarchical organization of living organisms is in one of the following orders: (a) Atoms, molecules, compound, cells, tissues, organs, systems, organism (b) Atoms, molecules, organelles, cells, tissues, organs, systems, organism (c) Atoms, elements, molecules, cells, tissues, organs, systems, organism (d) atoms, molecules, elements, cells, tissues, organs, organ systems, organism

3. Sister chromatids are: (a) two identical copies of a single chromosome produced during s-phase (b) pairs of chromosomes (c) points of attachments of centromeres to the chromosomes (d) chromosomes found in cells of sisters

4. In a monohybrid cross between round seed and wrinkled seed, given that round is dominant over wrinkled, what is the number of wrinkled seed that would be formed at F_2 if the total number is 7324? (a) 456 (b) 786 (c) 686 (d) 860

5. Steepness of slope generally affect (a) Rainfall (b) Drainage (c) Sunlight (d) All of the options

6. Bacteria differ from eukaryotic forms of life in that they: (a) are causes of all infectious diseases (b) have no nuclear membrane (c) reproduce by binary fission (d) have a thick cell-wall

7. One of the following organisms exhibits a closed and single circulatory system (a) Insect (b) Earthworm (c) Fishes (d) Mammals

8. Coelomates are animals with (a) no body cavity (b) true body cavity (c) false body cavity (d) two gin layers

9. This tissue is made up of tracheids, vessels, fibres and parenchyma. What is it? (a) Phloem (b) sclerenchyma (c) xylem (d) ground tissue

10. The important processes which bring about recycling of carbon dioxide between the biotic and abiotic components of an ecosystem are all of the following except (a) photosynthesis (b) respiration (c) decay (d) burning of fossil fuels

11. When a cut is made on the trunks of certain trees, the milky fluid exuded is called (a) rubber (b) resin (c) alkaloid (d) latex

12. The system of membrane-lined sacs that forms channels throughout the cytoplasm and whose membrane is continuous with the nuclear membrane is the (a) Mitochondrion (b) Ribosomes (c) Endoplasmic reticulum (d) Golgi apparatus

13. The type of Farming which involves raising livestock only is called (a) Mixed farming (b) Subsistence farming (c) Pastoral farming (d) Monoculture

14. Which of the following statements is NOT correct? Hormones (a) are circulated by blood and lymph (b) have their effect on target organs (c) complement nervous co-ordination (d) are not produced in specific glands.

15. If 80 grasshoppers are found in a field with a total area of 100m² what is the population density of grasshopper in the field? (a) 0.08 per m² (b) 0.8m² (c) 80m² (d) 100 m²

16. Which of The following is part of the axial skeleton in a mammal? (a) Phalange (b) Tarsal (c) Sacrum (d)Patella

17. Fruits that develop without fertilization and are seedless are known as (a) Parthenocarpic fruits (b) Aggregate fruits (c) Simple fruits (d) Epicarpic fruits

18. Grasping fingers and toes as well as eyes positioned in front of the head are features of (a) Certaceans (b) Carnivores (c) Rodents (d) Primates

19. One of the major differences between DNA and RNA is that (a) DNA is made of ribose sugars and double stranded unlike RNA (b) DNA is made of ribose sugar and single stranded unlike RNA (c) RNA is made of ribose sugar and double stranded like DNA (d) RNA is made of ribose sugar and single stranded unlike DNA

20. A major difference between Arachnids and

21. Annelids is that…. (a) In Annelids, body consists of dissimilar segments unlike in Arachnids (b) In Annelids, body consists of similar segments unlike in Arachnids (c) In Arachnids, the cephalothorax is not distinct unlike in Arachnids

(d) In Annelids, the cephalothorax is distinct unlike in arachnids

22. The process in which the internal environment of an organism is maintained is called (a) Co-ordination (b) Homeostasis (c) Excretion (d) Metabolism

23. Which of the following is the hardest material in the body of animals? (a) Cartilage (b) Bone (c) Enamel (d) Dentine

24. One of these statements is true of caryopsis (a) Pericarp and seed coat are fused (b) Pericarp is free from seed coat (c) pericarp splits open (d) pericarp with a superior ovary

25. A biological species must possess the following characteristics except (a) Live only in one place (b) Must interbreed (c) Must produce fertile offspring (d) The mating between members must be free

26. Nerve endings are located in which part of the tooth (a) crown (b) Cement (c) Pulp cavity (d) Gum

ANSWERS TO BIOLOGY 2012

1.D 2.B 3.A 4.Incomplete Question 5.D 6.B 7.C 8.B 9.C 10.D 11.D 12.C 13.C 14D 15.Incorrect options 16.C 17.A 18.D 19.D 20.B 21.B 22.C 23.A 24.A 25.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2011 POST-UME SCREENING EXERCISE - BIOLOGY

1. Which of these groups of animals rivals mammals in the display of parental care features? A. Birds, B, Reptiles. C. Pisces. D. None of the above

2. An assemblage of populations of different species which interact through trophic & spatial relationship is best described as an   A. City B. Community C. Ecosystem D. Niche

3. In which biome would you expect to have the shortest growing season? A. tropical rain forest B. guinea savanna C. sudan savanna D. deserts.

4. Which of the following is an incorrect statement about savanna? A. It occupies about 80% of the land surface of Nigeria B. It has no woody species. C. It is usually burnt annually D. It is a closed or nearly closed cover of grasses.

5. Which of the following habitats cannot be used for the study of succession? A. abandoned farmland B. a pond C. savanna grassland D. well cultivated farmland

6. In which of these associations is much harm done to one of the partners? A. symbiosis B. commensalisms C. parasitism D. mutualism

7. Effect of air pollutant does not include: A. formation of carboxyl haemoglobin B. displacement of digested food C. lowering plant yield D. damage breathing organs

8. A typical feature of a plant cell is the presence of A. chromosome in nucleus B. cellulose cell wall. B. mitochondria. D. membrane around the nucleus

9. Non seed plants are found in A. desert and arctic regions only. B. all environments. C. cold mountain areas and hot springs D. tropical and subtropical regions only

10. Which of the following phyla has been found to be the most successful in the animal kingdom? A. phylum Annelida. B. phylum Arthropoda. C. phylum Chordata. D. phylum Mollusca.

11. In the tropical rainforest, there is little or no litter on the forest floor because of high A rainfall B. temperature C. light intensity D. rate of decomposition

12. Adaptive features of plants to desert conditions include A. thick barks, succulent stems and sunken stomata B. thin barks, succulent stems and sunken stomata C. thin barks, air floats on stems and sunken stomata D. air spaces on tissues, adventitious roots and thin barks

13. The distribution of plants in rainforest is governed mainly by A. Vegetation. B soil types C. amount of rainfall D. rainfall pattern

14. The greatest influence on a stable ecosystem in nature is A. man B. pollution C. animal D. rainfall

15. Which of the following is the basic unit of classification? A. genus. B. species. C. phylum. D. kingdom.

16. Which two structures are present in a palisade cell but not in a liver? A. cell wall and cytoplasm B. cell wall and chloroplast C. cell membrane and cytoplasm. D. cell membrane and chloroplast

17. Workers in deep mines usually suffer from dehydration because A. water is lost due to evaporation B. water is lost due to defecation C. water is lost in the form of sweat D. water is lost along with salts in the form of sweat

18. Glucose is reabsorbed in the kidney mainly by A. Bowman's capsule B. Loop of Henle C. Proximal Convoluted Tubule D. Distal Convoluted Tubule

19. The most common substrate of respiration is A. Fats B. Amino acids C. Glucose D. Sucrose

20. The rate of heart beat in an adult human being is A. 71 beats per minute B. 72 beats per minute C. 73 beats per minute D. 74 beats per minute

21. One of the following is not true A. Saprophytic nutrition involves feeding on soluble organic material from inorganic substances B. Symbiosis is a nutritional relationship in which both organisms involved derive benefit C. A parasite causes injuries to its host in the course of getting its food D. Holozoic mode of nutrition can be seen in animals, canivorous plants and some protists

22. _____ is responsible for the direction of growth and development of the organism. A. The nucleus B. The DNA C. The neuron D. The RNA

23. The chromosome number in man is A. 46 B. 23 C. 92 D. 58

24. Effectors are A. muscles which work in response to the stimulus received from the motor nerves. B. glands which work in response to the stimulus received from the motor nerves. C. muscles or glands which work in response to the stimulus received from the motor nerves. D. efferent neurons.

25. The following are formed in the bone marrow except A. platelets B. basophils C. granulocytes D. lymphocytes

ANSWERS TO BIOLOGY 2011

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1.A 2.C 3.D 4.B 5.C 6.C 7.B 8.B 9.C 10.B 11.D 12.A 13.C 14.A 15.B 16.B 17.D 18.C 19.C 20.B 21.A 22.B 23.A 24.C 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA
2010 POST-UTME SCREENING EXERCISE
BIOLOGY

1. Which of the following is the basic unit of classification of plants and animals? (a) genus (b) species (c) phylum (d) kingdom
2. Mendel's first law is known as the law of (a) use and disuse (b) segregation of genes (c) evolution (d) independent assortment of genes.
3. An interlocking form/pattern of feeding relationship is called (a) food chain (b) nutrition (c) consumer (d) food web
4. The group of animals described as glorified reptiles is (a) Pisces (b) Amphibian (c) Aves (d) Mammals
5. The anal and dorsal fins of fish are used for: (a) steering (b) buoyancy (c) upward movement (d) controlling rolling movement (e) downward movement
6. The significance of mitosis includes all of the following except (a) genetic stability (b) growth (c) cell replacement (d) degeneration
7. Which of the following is absent in the prophase stage of meiosis? (a) leptonem (b) zygonem (c) pachynem (d) triplonema
8. The photosynthetic pigments include: (a) chlorophyll and carotenoids. (b) chloroplasts and cytochromes (c) melanin and haemoglobin. (d) Carotenoids and haemoglobin
9. Which of the following produces both hormones and enzymes? (a) pancreas (b) ileum (c) gall bladder (d) kidney
10. Of the following, which one lacks chaetae, tentacles and antennae? (a) snail (b) earthworm (c) millipede (d) crab (e) snake
11. Etilolation is caused by the influence of (a) O_2 (b) water (c) mineral salts (d) HCl (e) light
12. Epigeal germination can be found in: (a) sorghum (b) maize (c) millet (d) groundnut
13. _____ is not sex-linked (a) stunted growth (b) river blindness (c) haemophilia (d) colour blindness.
14. The pryrenoid in Spirogyra: (a) usually contains starch (b) is suspended by cytoplasmic strands (c) is mainly used for respiration (d) excrete waste product
15. Flower is to the angiosperm as _____is to gymnosperm. (a) pines (b) cords (c) cone (d) anther
16. Alternation of sexual and asexual method of reproduction is found in_____ (a) euglena. (b) ferns (c) blue green algae (d) grasses
17. _____ is not a non-seed plant. (a) fern (b) conifer (c) cycad (d) none of the above
18. Which type of association is shown by a fern growing on the stem of oil palm? (a) epiphytism (b) saprophytism (c) commensalism (d) symbiosis
19. Which of the following is likely to encourage inbreeding in plants? (a) dioecious (b) protandfous (c) monoecious (d) hermaphrodite
20. The biological association that contributes directly to succession in a community is: (a) competition (b) predation (c) parasitism (d) commensalism
21. Grasses recover quickly from bush fires in the savanna because of their _____ (a) fibrous roots (b) succulent stems (c) perennating organs (d) rapid growth rate
22. The ability of an organism to live successfully in an environment is known as _____ (a) resistance (b) competition (c) succession (d) adaptation
23. The community of plants in which the same species occur from year to year is the _____ (a) perennial species (b) climax species (c) pioneer vegetation (d) annual species
24. _____ is an autotrophic mode of nutrition. (a) chemosynthesis (b) saprophytism (c) parasitism (d) symbiosis.
25. Which of the following is not an organ? (a) leaf (b) heart (c) kidney (d) bone

ANSWERS TO BIOLOGY 2010
1.B 2.B 3.D 4.C 5.A 6.D 7.D 8.A 9.A 10.E 11.E 12.D 13.B 14.A 15.C 16.B 17.B 18.A 19.A 20.A 21.C 22.D 23.B 24.A 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2009 POST-UME SCREENING EXERCISE - BIOLOGY

1. One of these is not found in Urine (a) Water (b) Sodium chloride (c) Nitrogenous compounds (d) Calcium chloride (e) Nitrogenous salts
2. An organism with a pair of indistinguishable genes is a (a) heterozygote (b) hybrid (c) allelomorph (d) homozygote (e) diploid
3. The fruit formed from a single flower having several free carpel's is called (a) multiple fruit (b) simple fruit (c) aggregate fruit (d) dehiscent fruit (e) indehiscent fruit
4. The function of ossicles (maleus, incus and stapes) in the mammalian ear to (a) transmit vibrations (b) regulate pressures (c) support of the inner ear (d) maintain balance during motion (e) secrete oil
5. "Jointed skeleton" is absent in the (a) cockroach (b) spider (c) millipede (d) snail (e) house fly
6. Mucor and Spirogyra can be put in a group because they (a) are unicellular (b) have spores that are dispersed by wind (c) can live independent lives (d) reproduce sexually (e) have bodies made up of thallus and filaments alternatively.
7. The organ through which nourishment and oxygen diffuse into an embryo is called (a) amnion (b) chorion (c) umbilical cord (d) oviduct (e) placenta
8. A tapeworm fasten itself to the intestine of its host with (a) neck & sucker (b) hooks & suckers

(c) Rostellum & suckers (d) proglottis & neck (e) rostellum, hooks & suckers

9. Which of these is false about the piliferous layer of a root? It (a) has a thin cuticle (b) is the outermost layer of the cortex (c) may bear root hairs (d) breaks down with age (e) is replaced by cork in old roots

10. Anaerobic respiration in yeast produces (a) CO_2 & ethanol (b) CO_2 & H_2O (c) CO_2 & O_2 (d) CO_2 & glucose (e) Ethanol & H_2O

11. Which one of these set of factors is completely abiotic? (a) turbidity, tide salinity, plankton (b) pressure, pH, soil, insect (c) water, soil, bacteria, salinity (d) pH, bamboos, wind, rainfall (e) light, altitude, wind, humidity

12. In which of these are flagella and cilia found? (a) flatworms (b) protozoa (c) coelenterates (d) annelids (e) nematodes

13. The three important organs that are situated close to the stomach are (a) liver, kidney & gall bladder (b) pancreas, liver & kidney (c) gall bladder, pancreas & spleen (d) liver, kidney & spleen E. kidney, gall bladder, liver

14. The plantain reproduces asexually by (a) spores (b) bods (c) fragments (d) sucker (e) flowers

15. The major function of swim-bladder in fish is (a) breathing (b) swimming (c) diving (d) repelling enemy (e) buoyancy

16. The part of the central nervous system concerned with answering an examination question is the (a) spinal cord (b) cerebellum (c) oryx (d) cerebrum (e) medulla oblongata

17. Wind pollinated flowers usually have (a) long styles (b) sticky stigmas (c) small and short stigmas (d) rough pollen grains (e) short styles and pollen

18. The ridicule of a bean seedling grows most rapidly in the region (a) of the root tip (b) below the top soil (c) just around the root tip (d) just below the root tip (e) just above the root tip

19. A key similarity between nervous and hormonal system is that both (a) involve chemical transmission (b) have widespread effects (c) shed chemicals into the blood stream (d) evoke rapid response to eliminate response

20. The bone of the neck on which the skull rests is (a) odontoid (b) axis (b) occipital (d) atlas (e) patella

21. A child with blood group genotype different from those of both parents and with a mother of genotype OO, can only have a father of genotype (a) A (b) B (c) OO (d) AB (e) AA

22. A true climax community (a) changes from year to year (b) persists until the environment changes (c) the first stage in plant succession (d) consist of tallest trees and small animals (e) is in a state of perturbation.

23. In a predator food chain involving secondary and tertiary consumers, the organisms become progressively (a) smaller (b) equal in number (c) larger and fewer along the food chain (d) parasitized along the food chain as consumers get bigger (e) space in distribution

24. Which one of these is an adaptation to a xerophytes environment? (a) Fleshy tissue with reduced leaves (b) extensive surface roots & broad leaves (c) thick barks and broad leaves (d) rough leaves and shallow root system (e) stunted growth and surface roots.

25. When it is cold, the blood vessels of the skin (a) dilate to increase blood flow to the skin (b) constrict to reduce the amount of blood flowing to the skin (c) dilate to reduce the amount of blood flowing to the skin (d) constrict to increase the amount of blood flowing to the skin.

ANSWERS TO BIOLOGY 2009
1.B 2.D 3.C 4.A 5.D 6.D 7.E 8.B 9.A 10.A 11.E 12.B 13.C 14.D 15.E 16.D 17.B 18.D 19.A 20.D 21.D 22.B 23.C 24.A 25.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2008 POST-UME SCREENING EXERCISE - BIOLOGY

1. Which of the these types of skeleton is most appropriate to the cockroach (a) Hydrostatic skeleton (b) Exoskeleton (c) Endoskeleton (d) Cartilaginous skeleton

2. When proteins are broken down they provide (a) Oxygen (b) Carbohydrate (c) Energy (d) Amino acids

3. The function of lenticels is (a) to receive excess water in the plant (b) to absorb water from the atmosphere (c) for gaseous exchange (d) to absorb light

4. One of the functions of xylem (a) strengthening the stem (b) manufacturing food (c) conducting manufactured food (d) none of the above

5. People suffering from myopia (a) can see near objects clearly (b) can see far away objects clearly (c) cannot see any object clearly (d) are colour-blind

6. The cilia in paramecium are used for (a) respiration (b) locomotion (c) protection (d) excretion

7. The study of an⇒⇒⇒ organisms and the environment of an abandoned farmland is the Ecology of (a) a community (b) a population (c) a species (d) an ecosystem

8. At fertilization (a) one chromosomes from the male joins another from the female (b) one gene from the male combines with the another from the female (c) the male nucleus fuses with the female nucleus (d) one set of chromosome combines with another set from the female

9. The neck region of the tapeworm (*Taenia* spp.) is responsible for the (a) the production of eggs (b) the storage of eggs (c) the formation of new segments (d) the development of the suckers

10. Which of the following is characteristic of the animal cell (a) presence of chloroplasts (b) Possession of a cellulose cell wall (c) absence of large vacuoles (d) Presence of large vacuoles

11. In the life history of Schistosoma (Bilharzia), one of the following is the intermediate host (a) Man (b) Snail (c) Mosquito larva (d) Fish

12. The hormone which tones up the muscles of a person in the time of danger is from the (a) thyroid gland (b) pancreas c) Adrenal gland (d) spleen

13. The movement of molecules from a region of higher concentration to one of lower concentration is (a) diffusion (b) transpiration (c) osmosis (d) plasmolysis

14. The region of cell diffusion in a root is (a) root cap (b) endodermis (c) xylem (d) meristem

15. Which is the following is not an excretory organ? (a) lungs (b) kidney (c) leaf (d) large intestine

16. The part of the mammalian brain responsible for maintaining balance is (a) medulla oblongata (b) cerebellum (c) optic lobe (d) cerebrum

17. A sugar solution was boiled with Fehling's solutions A and B and the colour remain blue. The sugar tested was (a) Glucose (b) maltose (c) fructose (d) sucrose

18. The blood vessel which carries digested food from the small intestine to the liver is the (a) renal vein (b) renal artery (c) hepatic artery (d) hepatic portal vein

19. The maize grain is regarded as a fruit and not a seed because (a) it is covered by a sheath of leaves (b) the testa and fruit wall fuse after fertilization (c) it has both endosperm and cotyledon (d) the pericarp and seed coat are separate

20. Identical twins are produced under one of the following conditions (a) two ova fertilized at the same time by the sperm (b) one ovum fertilized, divides to give two embryos (c)two ova fertilized by one sperm (d) one ovum fertilized by two sperms

21. Partially digested food ready to leave the stomach is called (a) chyme (b) curb (c) glycogen (d) paste

22. The particles found in the blood which play an important role in blood clotting are called (a) platelets (b) red blood cells (c) monocytes (d) granulocytes

23. In a cross between a normal male and a female carrier for haemophiliac disease, the percentage of their sons expected to suffer the disease as haemophiliac is (a) 25% (b) 50% (c) 70% (d) 45%

24. Which of the following hormones is produced during fright or when agitated? (a) insulin (b) adrenalin (c) thyroxine (d) pituitary

25. Grasses $\Rightarrow$ Grasshopper $\Rightarrow$ Lizards $\Rightarrow$ Snakes $\Rightarrow$ Hawks. In the food chain, the organisms which are the least in number are (a) Grasses (b) Hawks (c) Lizards Snakes

26. One significant difference between roots and stem is that (a) Branch root originate in the pericycle while branch stems do not (b) Stems are always below the ground while roots are always under the ground (c) Stems are positively geotropic while roots are negatively geotropic (d) Stems are sometimes used for storage while roots are never so used.

27. The arrangements below are steps in protein digestion. Which is the correct sequence? a-polypeptides, b-protein, c-amino acids, d-peptones (a) a⇒b⇒c⇒d (b) c⇒d⇒a⇒b (c) b⇒c⇒ a⇒d (d) b⇒d⇒a⇒c

ANSWERS TO BIOLOGY 2008

1.B 2.D 3.C 4.A 5.A 6.B 7.A 8.C 9.C 10.C 11.B 12.C 13.A 14.D 15.D 16.B 17.C 18.D 19.B 20.B 21.A 22.A 23.B 24.B 25.B 26.A 27.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2007 POST-UME SCREENING EXERCISE - BIOLOGY

1. Where is energy produced in a cell? (a) Nucleus (b) Lysosomes (c) Mitochondria (d) Nucleolus

2. Which of the following organisms does not exist as a single free-living cell? (a) Amoeba (b) Euglena (c) Clamydomonas (d) Volvox

3. Englena is an autotrophic organisms because it: (a) has flagella (b) has plant and animal feature (c) can manufacture its food (d) moves fast

4. In which of the following organism does a single cell perform all function of active movement, nutrition, growth, excretion and photosynthesis? (a) Paramecium (b) Amoeba (c) Euglena (d) Hydra

5. What is the function of contractile vacuole in Paramecium? (a) produces enzymes (b) gets rid of excreta (c) stores and digests food (d) gets rid of excess water

6. The ability of organisms to maintain a constant internal environment is known as: (a) dieresis (b) endosmosis (c) plasmolysis (d) homeostasis

7. Which of the following is the medium of transportation of nutrients within unicellular organism? (a) Lymph (b) Plasma (c) Protoplasm (d) Serum

8. In aerobic respiration, oxidative phosphorylation takes place in (a) cytoplasm (b) lysosome (c) microchondrion (d) ribosomes

9. Bryophytes are different from flowering plants because they (a) are simple small plants (b) carry out alternation of generation (c) posses small (d) posses no vascular tissue

10. In lower plants like mosses, the structure which performs the functions of roots of higher plants is called (a) roots hairs (b) rhizoids (c) hyphae (d) roots

11. Which of the following components of an ecosystem has the greatest biomass? (a) primary producers (b) primary consumers (c) secondary consumers (d) tertiary consumers

12. The young shoot of a plant is referred to as (a) radical (b) plumule (c) bud (d) branch

13. The name of a bacterium which derives its energy from oxidizing nitrites into nitrates is (a) nitrosomonas (b) azotobacter (c) nitrobacter (d) Escherichia coli

14. Potometer is used to measure (a) rate of osmosis (b) rate of diffusion (c) rate of transpiration (c) rate of photosynthesis

15. Meiotic cell division ensures that (a) many similar cells are produced (b) chromosome number of cells is halved (c) cells produced are doubled (d) cells produced posses the same chromosome number

16. The stem of young herbaceous plants are kept upright mainly by (a) osmotic pressure (b) turgidity (c) transpiration pull (d) root pressure
17. Which of the following tissues is not found in the stem and root of monocotyledons? (a) xylem (b) cambium (c) pith (d) pericycle
18. Fruit enlargement can be induced by spraying young ovary with (a) gibberellins, ethylene and abssisic acid (b) auxin, abscisic acid and ethylene (c) auxin, cytokinin and gibberellins (d) auxin, kinin and gibberelin
19. A dry, indehiscent, winged fruit formed from one carpel is known as (a) schizocarp (b) caryopsis (c) samara (d) nut
20. A fruit which develops without fertilization is described as (a) simple (b) aggregate (c) multiple (d) parthenocarpic
21. A dwarf plant can be stimulated to grow to normal height by the application of (a) thyroxin (b) gibberelin (c) insulin (d) kinin
22. The condition known as cretinism is caused by the deficiency of (a) Vitamin A (b) insulin (c) thyroxin (d) vitamin C
23. The difference between viviparous and oviparous animal is (a) possession of yolked eggs (b) laying and brooding of eggs (c) possession of yolkless egg (d) laying of unfertilized egg
24. The following are features of the tropical rainforest except (a) loose and moist soil (b) short trees growing beneath tall trees (c) scanty trees with small leaves (d) presence of many animals.

ANSWERS TO BIOLOGY 2007
1.C 2.D 3.C 4.C 5.D 6.D 7.C 8.C 9.D 10.B 11.A
12.B 13.C 14.C 15.B 16.B 17.B 18.C 19.C 20.D 21.B
22.C 23.B 24.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2006 POST-UME SCREENING EXERCISE - BIOLOGY

1. Structures found in cells are listed below: i. Cell wall ii. Cell membrane iii. Chloroplast iv. Cytoplasm v. Nucleus vi. Sap vacuole. Which of these structures are found in both animal cells and plant cells? (a) i, ii and v (b) i, iii and v (c) ii, iii, and v (d) ii, iv, and v
2. Which of the following is not present in the nucleus of a cell? (a) Chromosomes (b) Nucleolus (c) Mitochondrion (d) Genes
3. An amoeba moving towards a crumb of cake in a pond most likely exhibits (a) phototropism (b) chemotaxis (c) thermotaxis (d) nastic movement
4. Which of following cells would most probably contain the greatest number of Golgi bodies (a) muscle cell (b) secretory cell (c) nerve cell (d) white blood cell
5. A group of similar cells performing the same function is (a) an enzyme (b) an organ (c) a tissue (d) an organelle
6. A plant which grows on another plant without apparent harm to the host plant is called (a) a parasite (b) an epiphyte (c) a saprophyte (d) a predator

$$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$$

7. The oxygen given off during the process in the above question is derived from (a) sunlight (b) water (c) carbon dioxide (d) atmosphere
8. When testing a leaf for starch, why is it first placed in boiling water? (a) to extract the chlorophyll (b) to remove colour from the leaf (c) to dissolve the starch (d) to stop chemical reactions
9. The petals of a flower are collectively called (a) calyx (b) capsule (c) carpel (d) corolla
10. Osmosis can be defined as diffusion of: (a) water molecules from an area of his concentration to an area of low concentration (b) water molecules from a dilute solution to a concentrated solution across a permeable membrane (c) water molecules from a concentrated solution a dilute solution through a semi permeable membrane (d) water molecules form a dilute solution to a concentrated solution through a semi permeable membrane
11. The ventricles of the mammalian heart are more muscular than the auricles because the (a) auricles have smaller capacity (b) ventricles are larger in size (c) ventricles pump blood to distant organs (d) ventricles receive more blood.
12. Which of the following statement is not correct about the function of each group of mammalian vertebrae? (a) caudal vertebrae support the tail and provide attachment for tail muscles (b) thoracic vertebrate articulate with ribs (c) lumber vertebrae provide attachment for abdominal muscles (d) sacral vertebrae support the skull and allow nodding and rotating movement.
13. In the adult toad, gaseous exchange takes place through (a) buccal cavity, skin and spiracle (b) buccal cavity, bladder and lungs (c) buccal cavity, skin and lungs (d) gills, skin and buccal cavity.
14. The brain and the spinal cord constitute the (a) automatic nervous system (b) sympathetic nervous system (c) somatic nervous system (d) central nervous system.
15. Which of the following parts of the mammalian brain is involved in taking the decision to run rather than walk (a) cerebellum (b) medullar oblongata (c) midbrain (d) cerebrum
16. Which part of the ear is responsible for the maintenance of balance? (a) cochlea (b) tympani membrane (c) Eustachian tube (d) semi-circular canals.
17. The foot of the bird shown below is strong an has strong claws on its digits. This implies that the bird (a) is a scavenger (b) is a bird of prey (c) uses the foot to supplement wing action (d) uses the foot to scratch the soil

Page 56
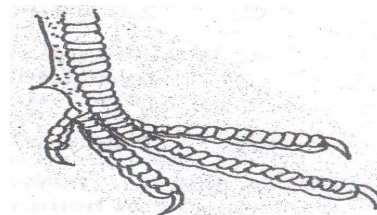
18. Which of the following is not a means of conservation? (a) replacing harvested mature timber trees with their seedlings (b) prevention of poaching (c) controlling excessive deforestation (d) burning of vegetation before cropping

19. One of the following statements is not true of viruses (a) they are micro-organisms (b) they are smaller than bacteria (c) they can be seen with an ordinary light microscope (c) they cause tobacco disease, polio and smallpox

20. Each of the following is an arthropod except the (a) crab (b) scorpion (c) spider (d) snail

21. The largest phylum in the animal kingdom is (a) Cnidaria (b) Mollusca (c) Chordata (d) Arthopoda
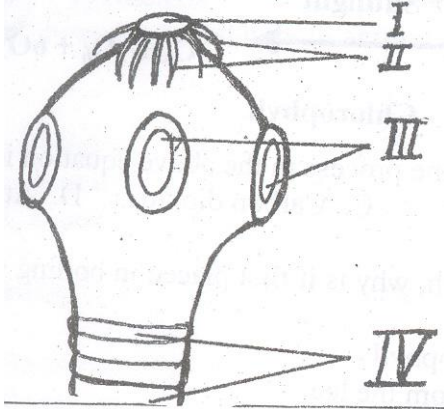

22. With reference to the figure above, which of these are correct? (a) I & II are proglottides and hooks (b) I & II are rostellum and suckers (c) III & IV are hooks and proglittids (d) II & IV are hooks and rostellum

23. The two species of human tapeworm can be distinguished by the presence or absence of (a) Scolex (b) hook (c) head (d) sucker

ANSWERS TO BIOLOGY 2006
1.D 2.C 3.B 4.B 5.C 6.B 7.B 8.D 9.D 10.D 11.C
12.D 13.C 14.D 15.D 16.D 17.D 18.D 19.C 20.D
21.D 22.B 23.B

1. Which of the following statement is not true about the properties of pressure in a liquid? Pressure
   A. at any point in a liquid is at right angle in all directions.
   B. is the same at all points on the same horizontal plane in a liquid
   C. decreases with height, and independent of shape and volume of the container.
   D. is dependent on the shape and volume of the container

2. Which of the following is not a Newton's law of motion?
   A. The time rate of change of linear momentum is directly proportional to the external force applied and it takes place in the direction of the force.
   B. In the absence of external forces, an object at rest remains at rest and an object in motion continues in motion with a constant velocity.
   C. If two objects interact, the force $\mathcal{F}_{12}$ exerted by object 1 on object 2 is equal in magnitude and opposite in direction to the force, $\mathcal{F}_{21}$ exerted by object 2 on object 1.

3. A force of 20N is applied to a spring of elastic spring constant of 200N/m. Calculate the energy stored in the spring.
   A. 2.50J   B.0.25 J   C.400 J   D. 40.0 J

4. Which of the following is not a self-luminous object?
   A. glow-worm   B. star   C. moon   D. sun

5. Which of the following is not an application of Total internal Reflection?   A. Mirage
   B. Binoculars   C. Optical Fibers
   D. Driving mirror

6. The reading on ADE temperature scale at the ice melting point is 40°A and 80°A at the steam point. Calculate the reading on the Celsius scale equivalent to 50°A
   A. 25°C   B.40°C   C.45°C   D.60°C

7. Calculate the heat required to convert 10g of ice at -10°C to water at 50°C . The specific heat capacity of ice and water are 2100 J/kgK and 4200 J/kgK respectively. The latent heat of Fusion of ice is $3.4 \times 10^5 JK^{-1}$
   A.2.10 kJ   B. 4.20 kJ   C.3.21 kJ   D. 5.71 kJ

8.
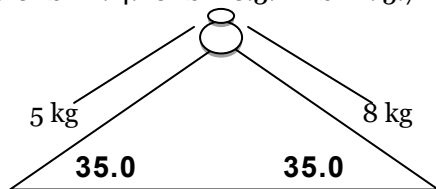
Calculate the acceleration of the system (in terms of the acceleration due to gravity, g), when it is released.
A.0.38g   B.0.13 g   C.0.15 g   D.0.39g

9. A train starting from rest accelerates at the rate of 6 m/s² for 20 seconds to attain a constant speed and it further travelled for another 20 seconds and decelerates at rate of 3 m/s² for 20 seconds. Calculate the total distance (in Kilometre) traveled by the train. A.4.0km   B. 4.4 km   C. 4.8 km   D.3.6 km

10. Anomalous behavior of water refers to
    A. Boiling of water at 100°C
    B. Freezing of water 0°C
    C. Contraction of water when it is heated between 0°C and 4°C
    D. Evaporation of water at ambient temperature.

11. Which of the following statements is true about collision event?
    A.Inelastic collision, both linear momentum and kinetic energy are conserved
    B. In elastic collision, linear momentum is conserved but the kinetic energy is not conserved but the kinetic energy is not conserved
    C. In elastic collision, both linear momentum and kinetic energy energy are conserved   D. In elastic collision, kinetic energy is conserved but the linear momentum is not conserved.

12. Which of the following is the function of a p-n junction semiconductor device?
    A. It transforms a direct voltage to AC voltage   B. It steps up an AC voltage
    C. It steps down an AC voltage
    D. It transform AC voltage to direct voltage

13. Five 2 Ω resistors were connected in two ways, in series and parallel. What is the ratio of the series equivalent resistance to parallel equivalent resistance? A.1:50   B. 2:5   C. 1:25   D.5:6

14. The surface tension of water can be reduced by adding the following except   A. detergent   B. oil   C.grease   D. sand

15. Which of the following is not an eye defect?
    A.Astigmatism   B. Hypermetropia
    C. Presbyopia   D. Malaopia

16. Calculate the energy stored in a capacitor of capacitance 50 μF when a voltage of 220 V is applied to its terminals.   A.2.0 Joule   B. 1.0 Joule   C.3.0 Joule   D. 4.0 Joule

17.
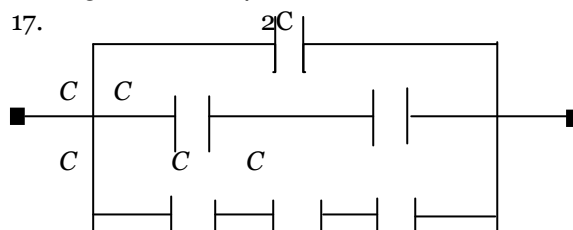
Calculate the equivalent capacitance between the terminals.   A. 6C/11   B. C/6   C.17C/6   D.6C

18. A material of threshold frequency 4.5×10^{-19} Hz was bombarded with Photons of frequency 8.0×10^{15} Hz. What is the kinetic energy of the emitted photoelectrons (in eV)? ($h = 6.60 \times 10^{-3}$ Js, $1,eV = 1.6 \times 10^{-19}$ J)   A.2.81 eV   B.2.19 eV   C.5.00 eV
    D. None of the above

19. Which of the following combinations of factors do not affect evaporation?   (i) Temperature   (ii) nature of liquid exposed   (iii)Impurities   (iv) Pressure   (v) Humidity   (vi)Drought   (vii) linear expansivity   (viii) electro negativity
    A.(vii) and (viii)   B.(i), (ii), (iii)
    C. (iii), (iv), (v), (vi)
    D.(i), (ii), (iii), (iv),(v)

20. A solid is said to sublime if it changes from   A. solid to liquid state
    B. solid to molten state
    C. solid to gaseous state
    D. solid to solid state

SOLUTION TO PHYSICS 2014

1. D
2. D
3. $E = \frac{1}{2} Ke^2$
    $e = \frac{k}{f} = \frac{200(N/M)}{10(N)} = 20m$
    $E = \frac{1}{2} \times 200 \times 20^2$
    $E = 100 \times 400$
    $E = 40000$ kJ
    $E = \frac{40000}{1000} = 40.0$J   **Ans:D**
4. D
5. C
6. $C = \frac{S_a - S_o}{S_{100} - S_o} \times 100$

    $= \frac{50 - 40}{80 - 40} \times 100$
    $= \frac{10}{40} \times 100$
    $= \frac{100}{4} = 25^oC$ **Ans:A**
7. $H = MC\theta \ (ice) + \frac{m}{ice} + mc\theta \ (water)$
    $= m(C; \theta + l; + C w \theta)$
    $= 10(2.1 \times 0 \times -(-10) + 340 + 4.2 \times 50.0)$
    $= 10(2.1 \times 10) + 340 + 4.2 \times 50)$
    $= 10 (21 + 340 + 210)$
    $= 5710J$
    $= \frac{5710}{1000} = 5.71$ KJ   **Ans: D**
8. $f = ma$
    $f = mg \sin A$
    $f = (m_2 - m_1)_g \sin A$
    $f = (8 - 5)_g \sin 35^o$
    $f = 3g \sin 35^o$
    $f = 1.72g$

$a = \frac{f}{m_1 + m_2}$
$a = \frac{1.72}{8 + 5}$
$a = \frac{1.72}{13}$
$a = 0.13$ **Ans:B**

9. $V = v \ tat$
    $V = at \ 0 = 0$
    $V = 6 \times 20$
    $V = 120mls$
    Total distance covered
    = Area of trapezium
    $= \frac{1}{2}(20 + 60)120$
    $= (20 + 60) 60$
    $= (80)60$
    $= 4,800m$
    $= 4.8km$ **Ans:C**

10. C
11. A
12. D
13. In series
    $R_1 + R_2 + R_3 \ldots\ldots Rn$
    $R_T = 2+2+2+2+2$
    $R_T = 10$
    In parallel
    $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \ldots \frac{1}{R_n}$
    $\frac{1}{R_T} = \frac{5}{2}$ $RT = 2/5$
    Ratio of equivalent series to equivalent parallel
    $10 : 2/5$
    Divide by 10
    $= 1: 1/25$
    No answer among options
14. D
15. D
16. Energy store $= \frac{1}{2} N^2$
    $\frac{1}{2} \times 50 \times 10^{-6} \times 220^2$
    $\frac{1}{2} \times 50 \times 10^{-6} \times 48,400$
    $\frac{1}{2} \times 2.42$
    $= 1.21$ J **No answer among options**
17. Capacitor in series
    $\frac{1}{C_r} = \frac{1}{C} + \frac{1}{C} + \frac{1}{C}$
    $\frac{1}{C_r} = \frac{3}{C}$
    $C_r = C/3$
    $\frac{1}{C_r} = \frac{1}{C} + \frac{1}{C}$
    $\frac{1}{C_r} = \frac{2}{C}$
    $C_r = C/2$
    Capacitor in parallel = 2C

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$C_r = \dfrac{C}{3} + \dfrac{C}{2} + \dfrac{2C}{1} = \dfrac{2C + 3C + 2C}{6} = \dfrac{17C}{6}$

Ans:C

18. $E = h(f - f_o)$

$E = 6.60 \times 10^{-34}(8.0 \times 10^{15} - 4.5 \times 10^{15})$

$E = 6.60 \times 10^{-34}(3.5 \times 10^{15})$

$E = 6.60 \times 10^{-34}(3.4 \times 10^{15})$

$E = \dfrac{23.1 \times 10^{-19}}{1.6 \times 10^{-19}}$

$E = 14.4 \times 10^{-19-(19)}$

$E = 14.4\ ev$ **Ans:D** (none of the above)

19. D
20. C

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA
2013 POST-UTME
SCREENING EXERCISE
PHYSICS

1. Adeoye moves a distance of 4.0km from a point, A on a bearing of $N30^O E$ to a point, B and then a distance of 3.0km on a bearing of $S60^O E$ to a point, C. Calculate Adeoye's resultant displacement from point (a) $10km, N60^o E$ (b) $5km, N67^o E$ (c) $3km, S30^o E$ (d) $4km, S60^o E$

2. Which of the following statements is true? (a) The unit of mass is Newton (N) (b) Weight of an object is a scalar quantity (c) The weight of an object varies from one place to another (d) The dimensions of weight are $M^{-2}LT^{-2}$

3. Which of the following is not an example of rotational motion? (a) rotation of electric fan blades (b) movement of car wheels (c) rotation of the earth about its axis (d) movement of a loaded spring about its equilibrium position

4. An object of mass, 5kg placed on an inclined plane (which is at an angle of 30° to the horizontal) is attached to a 10 kg mass through a pulley, with the 10 kg hanging vertically. Calculate the acceleration of the mass-system in terms of the acceleration due to gravity, g, if there is no friction between the 5kg mass and the plane. (a) $\dfrac{2}{5}g$ (b) $\dfrac{3}{5}g$ (c) $\dfrac{1}{2}g$ (d) $\dfrac{3}{4}g$

5. Which of the following is not true about the mechanical energy of a system in a conservative field? (a) total energy is zero (b) total energy is the sum of the kinetic energy and the potential energy (c) total energy is equal to the maximum value of kinetic energy (d) total energy is equal to the maximum value of potential energy.

6. Surface tension is the (a) pressure per unit length on either side of the imaginary line drawn on the liquid surface at rest (b) force per unit length on either side of the imaginary line drawn on the liquid surface at rest (c) current per unit length on either side of the imaginary line drawn on the liquid surface at rest (d) area per unit length on either side of the imaginary line drawn on the liquid surface at rest

7. A machine has an efficiency of 60%. If the machine applied a force of 2000N to overcome a load of 5000N, calculate the velocity ratio of the machine (a) 2.4 (b) 3.3 (c) 4.2 (d) 5.5

8. Which of the following statements is true about the hydrostatic pressure? (i) Pressure increases with height (ii) Pressure is independent of the shape and volume of the vessel (iii) Pressure is the same at all points on the same horizontal plane in a fluid (iv) Pressure is independent of the surface area in contact (a) (i), (ii), (iii) and (iv) (b) (i), (ii), and (iii) only (c) (ii), (iii) and (iv) only (d) (i), (ii), and (iv) only

9. The resistance of a platinum resistance thermometer is 160.5Ω at steam point and 60.5Ω at the melting point of ice. Calculate the resistance of the thermometer at $70^o C$ (a) 160.5Ω B. 165.5Ω (c) 130.5Ω (d) 170.5Ω

10. The wall separating a Bakery Oven and its environment is of h, 10m; breadth, 10m; and thickness, 25cm. If the rate of heat exchange between the Oven and its environment is 1000watt and the temperature of the environment is $27^o C$, calculate the temperature of the Oven, given that the Coefficient of thermal conductivity of the wall is $0.054 Wm^{-1}K^{-1}$ (a) $27.3^o C$ (b) $-40.2^o C$ (c) $40.2^o C$ (d) $73.3^o C$

11. Which of the following is not an application of expansion of solids? (a) Rivets (b) Bimetal strips (c) Fitting of wheels on rims in Railway Coaches (d) Regelation.

12. Which of the following is true about melting point of a liquid? (a) The presence of dissolved impurities increases the melting of a pure solid (b) An increase in pressure decreases the melting point of a substance that contracts in volume on freezing, more than the one that expands in volume (c) The melting point is not the same as the solidification of a substance (d) The presence of the dissolved impurities does not change the melting point of a pure solid.

13. A boy preparing to have his bath mixed 50kg of water at a temperature of $80^o C$ with 70kg of water at a temperature of $20^o C$. What is the temperature of the water mixture? (a) $45^o C$ (b) $75^o C$ (c) $65^o C$ (d) $35^o C$

14. Which of the following is not a property of sound wave? (a) Reflection (b) Diffraction (c) Polarization (d) Refraction

15. A pin at the bottom of a beaker filled with water appeared to be elevated when viewed from the top of the beaker. Calculate the displacement of the pin from the bottom of the beaker, if the beaker is filled to 8.0cm height and the refractive index of water is $\dfrac{4}{3}$. (a) 6.0cm (b) 2.0cm (c) 3.0cm (d) 4.0cm

16. A boy stands at a distance, x from a wall. When he shouted, the echo was heard 2 seconds later. Calculate the distance from the wall, given that the speed of light is 330m/s. (a) 500m (b) 340m (c) 250m (d) 495m

17. In a 60 prism of refractive index, 1.5, calculate the angle of minimum deviation when light is refracted through the prism (a) 40.2^o (b) 37.5^o (c) 37.2^o (d) 40.5^o

18. Calculate the resultant capacitance of the capacitor network, if each capacitor has a capacitance of $2\mu F$
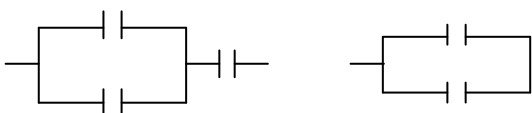
(a) $2.0\mu F$ (b) $1.0\mu F$ (c) $2.5\mu F$ (d) $2.3\mu F$

19. A cell of e.m.f 4.0V is connected in series to two resistors 2Ω and 4Ω, which are connected in parallel. Calculate the current which flows through the 4Ω resistor (a) 1.0A (b) 2.0A (c) 3.0A (d) 4.0A

20. A step-down transformer is energized by a 220V a.c supply and supplied a current of 10A to the secondary winding. Calculate the current which flows through the primary winding if the ratio of the primary winding to secondary winding is 10:3. (a) 10A (b) 3A (c) 4A (d) 5A

21. All the following properties are characteristics of X rays except (a) they have short wavelength (b) they have no charge (c) they are electromagnetic in nature (d) they do not affect photographic plates

22. $^{238}_{92}U \rightarrow {}^{234}_{90}Th + X$ .What particle is emitted in radioactive decay process shown above? (a) β particle (b) X-ray (c) α particle (d) γ ray

SOLUTION TO PHYSICS 2013
1. B 2.C 3.D 4.C 5.A 6.C 7.C 8.C 9.C 10.D 11.D 12.B 13.A 14.C 15.B 16.B 17.C 18.B 19.A 20.B 21.D 22.C

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2012 POST-UTME SCREENING EXERCISE PHYSICS

1. A uniform meter rule AB has a mass 15g. A 30g mass is suspended at the 10.0 cm mark, and another 5g mass is suspended at the 65.0cm mark. Calculate the position of the fulcrum that will keep the meter rule balanced horizontally. (a) 50.0cm (b) 32.0cm (c) 27.5cm (d) 17.9cm

2. A rectangular block measures 40cm x 25cm x 5cm and is made of a material of density 7800kg/m³. Calculate the pressure the block exerts on the floor when it stands on the smallest of its surfaces. (a) 312×10^3N/m² (b) 3.90×10^3N/m² (c) 1.95×10^4N/m² (d) 3.12×10^4N/m²

3. A ship sinks to the bottom of a 250m deep lake. The atmospheric pressure over the lake is 1.03×10^5Pa. Taking the density of water in the lake to be 1000kg/m³,calculate the pressure exerted on the boat [acceleration due to gravity 10 m/s²] (a) 2.60×10^6Pa (b) 2.50×10^6Pa (c) 2.60×10^5Pa (d) 1.03×10^5Pa

4. Three knives made of steel, plastic and fiat wood respectively is placed on a table for an equal amount of time. The steel knife feels coldest to touch because (a) The steel knife has the lowest temperature (b) The plastic and wooden knives have absorbed more heat from the environment than the steel knife (c) Both wooden and plastic knives have lower densities than the steel knife (d) The steel knife conducts heat faster from the finger than the wooden and plastic knives.

5. Two plane mirrors are inclined at angle 45° one to another. A ray of light has incident angle 20° at the surface of the first mirror. The reflected ray is then incident on the second mirror. Calculate the angle of reflection at the second mirror. (a) 65° (b) 45° (c) 25° (d) 20°

6. When the length of the string of a simple pendulum is L its period is 0.5π seconds. The period when the length is increased to 4L will be (a) 0.5π seconds (b) π seconds (c) 2π seconds (d) 4π seconds

7. The coefficient of linear expansion of aluminum is 23 x 10⁻⁶ K⁻¹. If the volume of a pot made with aluminum at temperature T_o is V_o, what will be the change in temperature resulting in a decrease of 0.20% in volume of the pot? (a) -87° C (b) +87°C (c) +29°C (d)-29°C

8. A resonance tube is 40cm long. The second resonance is heard when the tube is three-quarter full. What is the frequency of the tuning fork placed near the mouth of the tube? [velocity of sound in air is 334 m/s] (a) 2511 Hz (b) 1670Hz (c) 835 Hz (d) 345 Hz

9. A coin is at the bottom of a bucket tilled with a liquid whose refractive index is 1.35. The coin appears to be 12.0cm below the surface of the liquid. Calculate the depth of the liquid. (a) 16.2cm (b) 13.4cm (c) 8.9cm (d) 5.4cm

10. A car accelerates at 5.0 m/s² for 6s, the travels at the speed attained for 20s, and comes to rest after another 4.0s. Calculate the average velocity of the car during the motion. (a) 25.0m/s (b) 20.0m/s (c) 1.25m/s (d) 0.16m/s

11. Which of the following quantities is equal to the area under a velocity-time graph? (a) Acceleration (b) distance travelled (c) Average velocity of motion (d) total time taken.

12. A 25 N force pulls a 2.0kg body up a 30° inclined plane. If the force is parallel to the plane and the body moves up the plane at constant velocity, calculate the magnitude of the frictional force between the body and the plane [g = 10m/s²] (a) 35N (b) 25N (c) 20N (d) 15N

13. Which of the following features is used to minimize heat loss due to conduction in a thermo flask? (a) The space between the two watts of the vacuum flask is evacuated (b) The vacuum flask is separated from the outer wall with corks (c) The surfaces of the vacuum flask are silvered (d) The

inner and outer walls of the flask are made of steel.

14. Which of the following quantities is a scalar quantity? (a) Electric field (b) Coulomb force (c) Electric potential (d) Acceleration due to gravity

15. The process by which a solid ranges directly to vapour is called (a) Evaporation (b) Fusion (c) Condensation (d) Sublimation

16. A 3.0cm object is placed 12.0cm in front of a bi-convex tens of focal length 8.0cm. Calculate the height of the image of the object. (a) 3.0cm (b) 6.0cm (c) 12.0cm (d) 24.0cm

17. Five 100-Watt bulbs are put on for 45 days during which the home-owner is on vacation. If 1kW-hour of electricity costs ₦7.50, how much does it cost the home-owner? (a) ₦168.75 (b) ₦90.00 (c) ₦4050.00 (d) ₦810.00

18. To convert an a.c. generator to a d.c. generator, one needs to (a) Remove the brush touching the slip rings (b) Laminate the armature (c) Replace the permanent magnets with soft iron-core armature (d) Replace the slip rings with split rings.

19. To use a mulli-ammeter to measure current up to 10A, what connection needs to be made? (a) A small resistance must be connected in series with the milli-ammeter (b) A small resistance must be connected in parallel with the milli-ammeter (c) A high resistance must be connected in parallel with the milli-ammeter (d) The milli-ammeter must be disconnected from the circuit.

20. Two resistors A and B are made of the same material. The radius of A is three times that of B and the length of A is half of B. The ratio of the resistance of A to that of B is (a) $\frac{3}{2}$ (b) $\frac{2}{3}$ (c) $\frac{2}{9}$ (d) $\frac{9}{2}$

21. Two 2μF capacitors are connected in parallel. The combination is connected in series with a 6μF capacitor. What is the equivalent capacitor for the combination? (a) 10.0μF (b) 8.0μF (c) 1.5μF (d) 2.4μF

22. A student afraid that the substance near him is radioactive places his lecture note between him and the substance. If truly the substance is radioactive, which of the following radiations can the notebook shield him from? (a) Gamma rays (b) Neutrons (c) Alpha particles (d) Energetic beta ray

SOLUTION TO PHYSICS 2012
1. C 2.D 3.A 4.D 5.C 6.B 7.C 8.A 9.A 10.A 11.B 12.D 13.B 14.C 15.D 16.B 17.C 18.D 19.B 20.No correct option 21.D 22.C

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2011 POST-UTME SCREENING EXERCISE PHYSICS

1. A body of mass m slides down an inclined plane with a constant velocity. If the angle of the incline is θ, the coefficient of kinetic friction between the body and the plane is A. cot θ B. cos θ C. tan θ D. sin θ

2. The density of sea water is 1030 kg/m³. What is the pressure at a depth of 80 m below sea surface? Atmospheric pressure is 1.013×10^5 Pa and acceleration due to gravity is 10 m/s². A. 9.25×10^5 Pa B. 8.24×10^5 Pa C. 7.23×10^5 Pa D. 8.34×10^9 Pa

3. 6000 J of heat is delivered to 10 g of dry ice at 0°C. What is the final temperature if the container has a heat capacity of 20 J/K? [specific heat of water = 4200 J/kg.K, latent heat of fusion of ice = 3.33×10^5 J/kg] A. 142.9°C B. 63.6°C C. 43.0°C D. 0°C

4. A sample of radioactive substance, whose half-life is 16 days, registers 32 decays per second. How long will it take for the rate of decay to reduce to 2 decays per second? A. 80 days B. 64 days C. 48 days D. 32 days

5. When white light passes through a triangular prism, the emerging rays of light arranged in order of decreasing angle of deviation are
A. Red, orange, yellow, green
B. Blue, green, orange, yellow,
C. Red, green, yellow, blue
D. Blue, green, yellow, orange

6. The electric field between two parallel plates is E. A particle of mass m and carrying charge q is released at a point half the distance between the plates. The velocity of the particle t seconds after its release is A. qEt/m B. qEt²/2m C. mqt²/2E D. mqt/2E

7. The velocity of a 500 kg car moving along a straight road, changes from 12 m/s to 20 m/s in 5 sec. calculate the average force moving the car. A. 2000 N B.1600 N C. 1200 N D. 800 N

8. When a 2 kg body is at a height 5 m above the floor, its velocity is 4 m/s. What is its total energy at this height? [acceleration due to gravity = 10 m/s²] A. 80J B.100J C. 116J D.180J

9. An airplane increases its speed from 36 km/h to 360 km/h in 20.0 s. How far does it travel while accelerating? A. 4.4km B. 1.1km C. 2.3 km D. 1.0km

10. In the simple circuit shown in Fig.1, E is a 24 V battery. Calculate the current I.
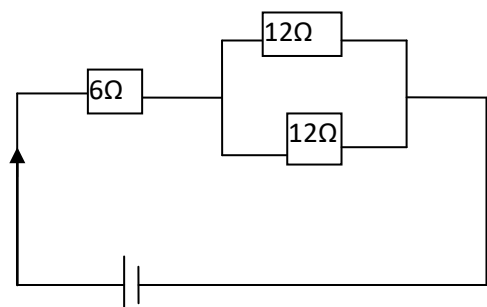

Fig 1H

A. 0.1A B. 0.2A C. $\frac{5}{6}$A D. 2.0A

11. An object is said to be in simple harmonic motion (SHM) if A. the acceleration is directly proportional to the displacement and is directed toward the equilibrium position of the object. B. the acceleration is inversely proportional to the displacement and directed toward the equilibrium position of the object. C. the displacement is directly proportional to the momentum and directed toward the equilibrium

position of the object. D. the momentum is directly proportional to the displacement and directed toward the equilibrium position of the object.

12. A wheel and axle is used to raise a weight of 600 N with an effort of 300 N. If the radii of the wheel and axle are 50cm and 10cm respectively, what is the efficiency of the system? A. 40% B. 50% C. 20% D. 10%

13. The term "Viscosity" is used to describe A. surface tension in fluids B. friction in fluids C. surface tension in solids D. moment in solids

14. A particle is in equilibrium under the action of three forces. One force is 40N towards the west and another is 30N towards the south. What is the third force acting on the body? A. 40N, N53°E . B. 50 N, N37°E C.50N, N53°E D. 40 N, N37°E

15. A hydraulic press works on the principle of transmission of A. force B. Energy C. volume D. pressure.

16. A cigarette lighter in a car is a resistor that, when activated, is connected across the 12-V battery. If the lighter dissipates 33W of power, find the resistance of the lighter. A. 9.90Ω B. 6.60Ω C. 4.36Ω D.17.50Ω

17. A p-n junction can act as A. an amplifier B. a rectifier C. an inductor D. a capacitor

18. Which of the following is not a thermometer? A. Thermocouple B. Pyrometer C. Hydrometer D. Platinum resistance thermometer,

19. Dry air of column length 10cm is trapped by a pellet of mercury of length 15 cm, with the open end uppermost. When the capillary tube is inverted the length of the air column increased to 25 cm while that of mercury remained constant. Calculate the atmospheric pressure (in cm of Hg).A. 35cmHg B. l5cmHg C. 20crnHg D. locmHg

20. Sound waves were sent out from a source and after being reflected from an obstacle were received by a sensor placed beside the source. If the waves were received 10 seconds after they were sent out, calculate the distance between the source and the obstacle. [speed of sound = 330m/s] A. 990m B. 660m C. 1320m D. 1750m.

21. Which of the following is not true about a chemical cell? A. In primary cells the process through which current is generated is irreversible. B. Secondary cells can be recharged after they run down by passing a current into the cell in the reverse direction C. Positive ions are attracted to the positive electrode where they become neutralized by acquiring electrons. D. Primary cells can be recharged.

22. Calcium has a work function of 19 eV with a wavelength of 150 nm. Calculate the maximum energy of a photo electron emitted. [1eV = 1.6 x 10^{-19}J, h = 6.6 x 10^{-34}Js] A. 6.35Ev B. 8.25eV C. 14.60eV D. 2.30eV

SOLUTION TO PHYSICS 2011
1. C 2.A 3.C 4.B 5D 6.A 7.D 8.C 9.B 10.D 11.A 12.A 13.B 14.B 15.D 16.C 17.B 18.C 19.A 20.No Correct Option 21.D 22.No Correct Option

OBAFEMI AWOLOWO UNIVERSITY ILE-IFE, NIGERIA 2010 POST-UTME SCREENING EXERCISE
PHYSICS 2010

1. Which of the following phenomena cannot be explained by the molecular theory of matter? (a) evaporation (b) expansion (c) conduction (d) radiation

2. The most likely measurement of length of an object using a vernier caliper is: (a) 3.0 cm (b) 3.3 cm (c) 3.33 cm (d) 3.333cm

3. If 21 g of alcohol of density 0.7 gcm^{-3} is mixed with 10 g of water, what would be the density of the resulting mixture? (a) 780 gcm^{-3} (b) 0.78 gcm^{-3} (c) 30 gcm^{-3} (d) 10 gcm^{-3}

4. For a particle having an x coordinate that varies in time according to the expression $x = 4t - 2t^2$. The instantaneous velocity of the particle at t = 2.5s is: (a) 12 m/s (b) 6m/s (c) 0 m/s (d) 10 m/s

5. A long-jumper leaves the ground at an angle of 20° above the horizontal and at a speed of 11 m/s. How far does it jumps in the horizontal direction? (a) 0.384m (b) 7.94m (c) 8.45m (d) 0m

6. A mass of 0.5 kg is attached to one end of a helical spring and produces an extension of 2.5 cm. The mass now set into vertical oscillation of amplitude 10 mm. The period of oscillation is: [g = 10 m/s^2] (a) 0.33 s (b) 100 s (c) 200 s (d) 280 s

7. A boat is passing under a bridge. The deck of the boat is 15m below the bridge. A small package is to be dropped from the bridge onto the deck of the boat when the boat is 25m from just below the drop point. What (boat) speed is necessary to have the package land in the boat? (g = 9.8 m/s^2). (a) 17 m/s (b) 14 m/s (c) 1.7 m/s (c) 4.9 m/s

8. An 0.60kg rubber stopper is whirled in a horizontal circle of 0.80m radius at a rate of 3.0 revolutions per second. What is the tension in the string? (a) 14 N (b) 80 N (c) 170 N (d) 24 N

9. An automobile is traveling at 60km/hr. Calculate the angular velocity of the 0.35m radius wheels. (a)16.67 rad/s (b) 47.6 rad/s (c) 21 rad/s (d) 171.4 rad/s

10. An air bubble at the bottom of a lake has a volume of 20 cm^3, pressure of 4.9Pa, and temperature 4°C. The bubble rises to the surface where the temperature is 20°C and the pressure 1.0 Pa. Find the volume as the bubble reaches the surface. (Take 1atm = 1.0 x 10^{5}N/m^2). (a) 124 cm^3 (b) 319cm^3 (c) 60 cm^3 (d) 104 cm^3

11. A gas at constant pressure of 4.0 x 10^5 Pa is cooled so that its volume decreases from 1.6 m^3 to 1.2 m^3.What work is performed by the gas? (a) 6.4x10^{5}J (b) 3.2x10^{5}J (c) 1.6x10^{5}J (d) 0.4x10^{5}J

12. Highly polished silvery surfaces are: (a) Poor absorbers but good emitter of radiation. (b) Good absorbers and good emitters of radiation. (c) Poor emitters but good reflectors of radiation (d) Poor emitters and poor reflectors of radiation.

13. An 0.040kg string 0.80m long is stretched and vibrated in a fundamental mode with a frequency of 40 Hz. What is the speed (of propagation) of

the wave and the tension in the string? (a) 64 m/s (b) 340 m/s (c) 32 m/s (d) 128 m/s

14. What is the total power output of a source with intensity 0.050W/m² at a distance of 3.0m from the source? (a) 112W (b) 5.6W (c) 15W (d) 30W

15. The superposition of two or more waves to produce a maximum or zero effect at a point is known as: (a) reflection (b) refraction (c) diffraction (d) interference

16. The acceleration due to gravity (a) Increases with increasing altitude. (b) decreases with increasing altitude (c) increases with increase in the square of the altitude (d) is not affected by the altitude.

17. Which of the following statements are correct of nuclear fission? During the process
    I. energy is released.
    II. more neutrons are released than those that cause fission.
    Ill. small nuclei merge into large nuclei.
    IV. there is a loss on mass.

18 Which of the following statements is not true? (a) Electric field intensity is force per unit charge. (b) Electric potential is a vector. (c) The S. I unit of electric field strength is N/C (d) electric field intensity is equal to potential gradient.

19. Which of the following about electrolysis is false? (a) Liquid that conduct electricity and are split up chemically by the current are electrolyzed. (b) The current is brought into the electrolyte by the anode. (c) The current is taken away from the electrolyte by the cathode. (d) The container which holds the electrolyte and the electrode is the voltmeter.

20. Which of the following is not true about the properties of x-rays? (a) They are not deflected by magnetic or electric field. (b) They ionized a gas, making it a conductor. (c) They are massive. (d) they have high penetrating power.

21. A transformer is connected to a 240 V supply. The primary coil has 40 turns, and the secondary is found to be 960 V. What is the ratio of the number of turns of the primary coil to the number of turns of the secondary coil? (a) 1:4 (b)4:1 (C) 1:6 (D) 6:122

22. Which of the following is not true about an object that is projected upwards at angle θ. (a) the velocity is maximum at the maximum height (b) the acceleration along the horizontal direction is zero. (c) the maximum range (R_{max}) for an object moving with speed u is given by $\frac{u^2}{g}$ (d) the time it takes to get the maximum height is equal to the time it takes to comes back to the point of projection.

23. When three coplanar non-parallel are in equilibrium.
    i they can be represented in magnitude and direction by the three sides of a triangle taken in order.
    ii the lines of action meet at a point.
    iii the magnitude of any one force equals the magnitude of the resultant of the other two forces.
    iv any one force is the equivalent of the other two.

Which of the following statements above are correct?
(a) i and iii only (b) i and ii only (C) i, ii, iii, and iv (d) none of them

24. Which of the following statements is not TRUE about a body performing simple harmonic motion? (a) the linear speed is the product of the angular speed and the radius or amplitude. (b) The linear acceleration is the product of the square of the angular speed and the displacement. (c) Frequency is the number of complete revolution per second made by a vibrating body (d) The SI unit of amplitude is Hertz (Hz).

25. If the force of gravity on an object of mass m, the gravitational field strength, g, is given by the following equation. (a) $g = \sqrt{mF}$ (b) $g = mF$ (c) $g = m\sqrt{F}$ (d) $g = \frac{F}{m}$

SOLUTION TO PHYSICS 2010
1.D 2.C 3.B 4.B 5.B 6.A 7.B 8.C 9.B 10.D 11.C 12.C 13.A 14.B 15.D 16.B 17. 18.B 19.D 20.C 21.A 22.A 23.B 24.D 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2009 POST-UME SCREENING EXERCISE - PHYSICS

1. The force with which an object is attracted to the earth is called (a) acceleration (b) mass (c) gravity (d) impulse (e) weight

2. The refractive index of a liquid is 1.5. If the velocity of light in a vacuum is 3.0 x 10⁸ms⁻¹, the velocity of light in the liquid is (a) 1.5 x 10⁸ms⁻¹ (b) 2.0 x 10⁸ms⁻¹ (c) 3.0 x 10⁸ms⁻¹ (d) 4.5 x 10⁸ms⁻¹ (e) 9.0 x 10⁸ms⁻¹

3. A train has an initial velocity of 44m/s and an acceleration of -4m/s². What is its velocity after 10 seconds? (a) 2m/s (b) 4m/s (c) 8m/s (do 12m/s (e) 16m/s

4. A man of mass 50kg ascends a flight of stairs 5m high in 5 seconds. If acceleration due to gravity is 10ms⁻², the power expended is (a) 100W (b) 300W(c) 250W (d) 400W (e) 500W

5. A machine has a velocity ratio of 5. If it requires a 50kg weight to overcome 200kg weight, the efficiency is (a) 4% (b) 5% (c) 80% (d) 50% (e) 90%

6. If the force on a charge of 0.2 coulomb in an electric field is 4N, then the electric intensity of the field is (a) 0.8N/C (b) 0.8N/C (c) 20.0N/C (d) 4.2N/C (e) 2.0N/C

7. The resistance of a wire depends on (a) the length of the wire (b) the diameter of the wire (c) the temperature of the wire (d) the resistivity of the wire (e) all of the above

8. Which of these is not contained in a dry cell? (a) carbon rod (b) paste of magnesium dioxide (c) paste of ammonium chloride (d) zinc case (e) copper rod

9. A simple pendulum 0.6m long has a period of 1.5s. What is the period of a similar pendulum

0.4m long in the same direction? (a) $1.4\sqrt{\frac{2}{3}}s$ (b) $1.5\sqrt{\frac{2}{3}}$ (c) 2.25s (d) 1.00s (e) 2.00s

10. A device that converts sound energy into electrical energy is (a) the horn of a motor car (b) an AC generator (c) a microphone (d) the telephone earpiece (e) a loud speaker

11. Radio wave has a velocity of 3×10^8m/s. If a radio station sends out a broadcast on a frequency 800KHz, what is the wavelength of the broadcast? (a) 375.0m (b) 267.0m (c) 240.0m (d) 37.5m (e) 26.7m

12. Which of these is not a fundamental S.I. unit (a) Metre (b) Ampere (c) Kelvin (d) Second (e) Radian

13. If two masses 40g and 60g respectively, are attached firmly to the end of a light metre rule, what is the centre of gravity of the system? (a) at the mid-point of the metre rule (b) 40cm from the lighter mass (c) 40cm from the heavier mass (d) 60cm from the heavier mass (e) indeterminate because the metre-rule is light

14. To find the depth of a sea, a ship sends out a sound wave and receives an echo after one second. If the velocity of sound in water is 1500m/s, what is the depth of the sea?(a) 0.75km (b) 1.50km (c) 2.20km (d) 3.00km (e) 3.75km

15. What is the number of neutrons in the Uranium isotope $^{238}_{92}X$? (a) 92 (b) 146 (c) 238 (d) 330 (e) 119

16. The mode of heat transfer which does not required material medium is (a) Conduction (b) Radiation (c) Convection (d) Propagation

17. The height at which the atmosphere ceases to exist is about 80km. if the atmosphere pressure in the ground level is 760mmHg, the pressure at a height of 20km above the ground level is (a) 380mmHg (b) 570mmHg (c) 190mmHg (d) 180mmHg

18. Which of the following is common to evaporation and boiling? They (a) take place at any temperature (b) are surface phenomena (c) involve change of state (d) take place at a definite pressure (e) none of the above

19. Which of the following instruments has a pure tone? (a) Guitar (b) Vibrating string (c) Turning fork (d) Screen (e) Horns

20. Four lenses are being considered for use as a microscope objective. Which of the following focal lengths is most suitable? (a) -5mm (b) +5mm (c) -5cm (d) +5cm (e) -5.5mm

21. The product PV where P is pressure and V is volume has the same unit as (a) Force (b) Power (c) Energy (d) Acceleration (e) All of the above

22. Two strings of the same length and under the same tension gave notes of frequencies in the ratio 4:1. The masses of the strings are in the rate of (a) 2:1 (b) 1:2 (c) 1:4 (d) 1:7 (e) 1:16

23. A household refrigerator is rated 200 watts. If electricity costs 5k per kwh, what is the cost of operating it for 20 days? (a) ₦4.80 (b) ₦48.00 (c) ₦480.00 (d) ₦1800.00 (e) ₦210.00

24. The resistance of a 5m uniform wire of cross-sectoral area of 0.2 x 10⁶m² is 0.45Ω. What is the resistivity of the maternal of the wire? (a) 1.10 x 10⁻⁶ohms m (b) 1.25 x 10⁻⁶ohms m (c) 2.40 x 10⁷ohms m (d) 1.70 x 10⁸ohms m (e) 1.40 x 10⁻⁸ ohms m

25. When a yellow card is observed through a blue glass, the card would appear as (a) Black (b) Green (c) Red (d) White (e) Purple
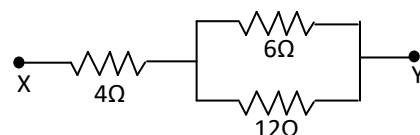
SOLUTION TO PHYSICS 2009
1.C 2.B 3.B 4.E 5.C 6.C 7.E 8.E 9.B 10.C 11.A 12.E 13.C 14.A 15.B 16.B 17.B 18.C 19.C 20.B 21.C 22.E 23.A 24.D 25.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2008 POST-UME SCREENING EXERCISE - PHYSICS

You may find the following constants useful:

Acceleration due to gravity	g	9.8 m/s^2
Gas constant	R	8.31 $J/mol.K$
Speed of light in vacuum	c	3.0 x $10^8 m/s$
Planck constant	h	6.63 x $10^{-34} J.s$

1. A convex lens of focal length 10.0cm is used to form a real image which is half the size of the object. How far from the object is the image? A. 45cm B. 30cm C. 15cm D. 20cm

2. A diverging lens of focal length 20cm forms an image halve of the size of the object. What is the object distance? A. 11.11cm B. 100cm C. 60cm D. 8.71cm.

3. An object of height 3.00cm is placed 10cm in front of a biconvex lens of focal length 15cm. The image of the object is A. Real and 3.00 cm tail B. Virtual and 3.00cm tall C. Virtual and 9.00cm tall D. Real and 9.00cm tall.

4. The most suitable type of mirror used for the construction of a searchlight is the A. Concave mirror B. Spherical mirror C. Convex mirror D. Parabolic mirror

5. Light waves and ripples of water are similar because both A. are longitudinal waves B. can be diffracted and refracted C. have the same velocity D. have the same frequency.

6. Three 4-Ω resistors were connected in series by 'Tola while Ade connected the same set of resistors in parallel. The ratio of the value obtained by Ade to that obtained by 'Tola is A. 1:2 B. 1:9 C. 1:10 D. 1:5

7. Three resistors are connected as shown in the diagram below. The equivalent resistance between points X and Y is
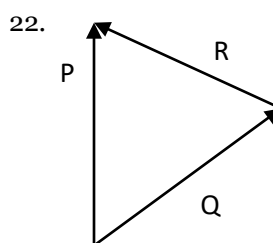

(a) 8.0Ω (b) 4.25Ω (c) 22.0Ω (d) 3.27Ω

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8. A coil of copper wire of N turns is kept rotating between the poles of a permanent magnet such that the magnetic flux linking the coil changes continuously. Which of the following statement is **TRUE** A. An emf is induced in the coil such that when the change of flux is positive the emf is positive, and when the change of flux is negative, the emf is negative. B. An emf is induced in the coil whose magnitude is inversely proportional to both the number of turns in the coil and the rate of change of magnetic flux. C. An emf is set up in the permanent magnet which reduces the flux in the coil to zero. D. a current flows in the coil and an emf is set up proportional to both the rate of change of the flux and the number of turns.

9. What is the equivalent capacitance between points A and B in the diagram below?
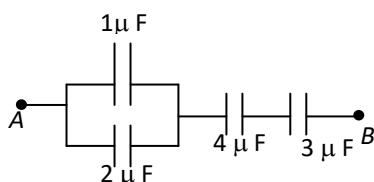
A. 12.0µ F   B. 1.1 µ F C. 1.6 µ F D. 7.7µ F

10. The principle of operation of an induction coil is based on A. Ohm's law B. Ampere's law C. Faraday's law D. Coulomb's law.

11. The half-life of a radioactive element is 9 days. What fraction of atoms has decayed in 36 days? A. $\frac{1}{16}$ B. $\frac{1}{4}$ C. $\frac{1}{2}$ D. $\frac{15}{16}$

12. Which of the following radiations cannot be deflected by an electric field or a magnetic field? A. a-rays, (ii) β-rays (iii) γ-rays (iv) X-rays B. (i) and (ii) only C. (iii) and (iv) only D. (i) and (iii) only.

13. The equation $^{150}_{62}X \rightarrow ^{150}_{63}Y + k^0_{-1} +$ energy, represent A. α-decay B. β-decay C. γ-decay D. photon emission.

14. Calculate the length of a displaced pendulum bob that passes its lowest point twice every second [g=10ms⁻²] A. 1.000m   B. 0.253m C. 0.450m D. 0.58m.

15. A vehicle of mass m is driven by an engine of power P from rest. Find the minimum time it will take to acquire a speed v. A. $\frac{mv^2}{P}$ B. $\frac{mv^2}{2P}$ C. $\frac{mv}{P}$ D. $\frac{mv}{2P}$

16. When a ball rolls on a smooth level ground, the motion of its centre is A. translational B. random C. oscillatory D. rotational.

17. A body accelerates uniformly from rest at 6ms⁻² for 8 seconds and then decreases uniformly to rest in the next 5 seconds. The magnitude of the deceleration is: A. 9.6ms⁻² B. 48ms⁻² C. 24.0ms⁻² D. 39.4ms⁻²

18. A nail is pulled from a wall with a string tied to the nail. If the string is inclined at an angle of 30° to the wall and the tension in the string is 50 N, the effective force used in pulling the nail is: A. 25N B. 25√3 N C. 50 D. 50√3N

19. A box of mass 40kg is being dragged along the floor by a rope inclined at 60° to the horizontal. The fictional force between the box and the floor is 100N and the tension on the rope is 300N. How much work is done in dragging the box through a distance of 4m? A. 680J B. 200J C. 100J D. 400J

20. A 70kg man ascends a flight of stairs of height 4 m in 7s. The power expended by the man is: A. 40 W B. 100 W C. 280 W D. 400 W.

21. Which of the following statements is not true? A. As the slope of an inclined plane increases, the velocity ratio decreases. B. The efficiency of an inclined plane decreases as the slope increases. C. The effort required to push a given load up an inclined plane increases as the slope increases. D. The mechanical advantage of a smooth inclined plane depends on the ratio of the length to the height of the plane.

22.

In the diagram above, P, Q and R are vectors. Which of the following options gives the correct relationship between the vectors? A. P = R − Q B. P = R + Q C. P = Q- R D. P + R + Q = 0

23. If *M* and *R* are the mass and radius of the earth respectively and *G* is the universal gravitational constant, the earth's gravitational potential at an altitude *H* above the ground level is: A. –GM/H B. –GM/(R+H) C. –GM/2H D.-GM(R-H)

24. The ice and steam points of a thermometer are 20mm and 100mm respectively. A temperature of 75°C corresponds to Y mm on the thermometer. What is Y? A. 100mm B. 70mm C. 80mm D. 60mm

25. An electric kettle with negligible heat capacity is rated at 2000 W. If 2.0 kg of water is put in it, how long will take temperature of water to rise from 20° to 100°? [*Specific heat capacity of water = 4200 J Kg⁻¹ K⁻¹*] A. 336 B. 420s C. 168s D. 84s

26. A quantity of ice at -10°C is heated until the temperature of the heating vessel is 90°C. Which of the following constants is NOT required to determine the quantity of heat supplied to the vessel? A. Specific latent heat of vaporization B. Specific heat capacity of ice. C. Specific latent heat of fusion D. Specific heat capacity of water.

27. The scent from a jar of perfume opened in one corner of a room is picked up in another part of the room. The perfume moves through the air molecules by A. Evaporation B. Osmosis C. Diffusion D. Convection.

SOLUTION TO PHYSICS 2008
1.C 2.C 3.C 4.D 5.B 6.B 7.A 9.B 10.C 11.D 12.C 13.B 14.B 15.A 16.A 17.A 18.A 19.B 20.D 21.D 22.B 23.B 24.C 25.A 26.A 27.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2007 POST-UME SCREENING EXERCISE - PHYSICS

You may find the following constants useful:

Acceleration due to gravity	g	$9.8 \, m/s^2$
Gas constant	R	$8.31 \, J/mol.K$
Speed of light in vacuum	c	$3.0 \times 10^8 m/s$
Planck constant	h	$6.63 \times 10^{-34} J.s$

1. What is the dimension of pressure? (a) $ML^{-1}T^{-2}$ (b) MLT^{-2} (c) ML^2T^{-3} (d) ML^{-3}

2. Calculate the length of a displaced pendulum bob that passes its lowest point twice every second. [g =10 ms^{-2}] (a) 1.000m (b) 0.253m (c) 0.450m (d) 0.58m

3. When a ball rolls on a smooth level ground, the motion of its centre is (a) translational (b) random (c) oscillatory (d) rotational

4. A vehicle of mass m is driven by an engine of power P from rest. Find the minimum time it will take to acquire a speed v. (a) $\frac{mv^2}{P}$ (b)) $\frac{mv^2}{2P}$ (c) $\frac{mv}{P}$ (d) $\frac{mv}{2P}$

5. A box of mass 40kg is being dragged along the floor by a rope inclined at 60° to the horizontal. The frictional force between the box and the floor is 100N and the tension on the rope is 300N. How much work is done in dragging the box through a distance of 4m? (a) 680J (b) 200J (c) 100J (d) 400J

6. A body is projected from the earth's surface with the hope of letting it escape from the earth's gravitational field. What is the minimum escape velocity? (a) 11.3km s^{-1} (b) 13.3kms^{-1} (c) 12.3 kms^{-1} (d) 14.3 kms^{-1} [Earth's radius = 6.4 x 10^3 Km, g = 10 ms^{-2}]

7. A uniform rod PQ of mass 2 kg and length of 1m is pivoted at the end P. if a load of 14N is placed on it at the centre, find the force that should be applied vertically upwards at Q to maintain the rod in equilibrium horizontally. (a) 7N (b) 28N (c) 68N (d) 17N

8. The energy contained in wire when it is extended by 0.02 m by a force of 500N is (a) 10^{4}J (b) 10^{3}J (c) 10J (d) 5J

9. What is the acceleration due to gravity 'g' on the moon, if g is 10 ms^{-2} on the earth? (a) 0.74ms^{-2} (b) 0.1ms^{-2} (c) 10.0ms^{-2} (d) 1.67ms^{-2}

10. A 5 kg block is released from rest on a smooth place inclined at an angle of 30° to the horizontal. What is the acceleration down the plane? (a) 5.0 ms^{-2} (b) 8.7ms^{-2} (c) 25.0ms^{-2} (d) 5.8ms^{-2} [g = 10ms^{-2}]

11. A rectangular metal block of volume 10^{-6} m^3 at 273 K is heated to 573K. If its coefficient of linear expansion is 1.2 x 10^{-5} K^{-1}. The percentage change of its volume is (a) 1.5% (b) 1.1% (c) 0.1% (d) 0.4%

12. A temperature scale has a lower fixed point of 40mm and an upper fixed point of 200mm. what is the reading on this scale when a thermometer reads 60°? (a) 136.0mm (b) 33.3mm (c) 96.0mm (d) 36.0mm

13. A 500 kg car was initially at rest travelled with an acceleration of 5ms^{-2}, what is it's kinetic energy after 4s? (a) 2.5 x 10^3 J (b) 10^{5}J (c) 5 x 10^{3}J (d) 5 x 10^{5}J

14. The temperature at which the water vapour in the air saturates the air and begins to condense is (a) melting point (b) triple point (c) dew point (d) melting point

15. The period of a simple pendulum will increase by what factor if its inextensible length increased by a factor of four (a) 2π (b) 4 (c) 2 (d) ¼

16. An air column 10cm in length is trapped into the sealed end of a capillary tube by a 15cm column of mercury with the tube held vertically. On inverting the tube, the air column becomes 15cm long. What is the atmospheric pressure during the experiment? (a) 76cm (b) 75cm (c) 60cm (d) 70cm

17. An electric cell has an internal resistance of 2Ω. A current of 0.5 A was measured when a resistor of resistance 5Ω was connected actors it. Determine the electromotive force of the cell. (a) 3.5V (b) 2.5V (c) 4.5V (d) 2.35V

18. The speed of light in air is 3 x 10^8 ms^{-1}. If the refractive index of light from air to water is $\frac{4}{3}$, calculate the speed of light in water. (a) 2.25 x 10^{8}ms^{-2} (b) 2.25 x 10^{8}ms^{-1} (c) 4.00 x 10^{8}ms^{-1} (d) 4.33 x 10^{8}ms^{-1}

19. It is known that an atomic nucleus comprises of positively charged protons. Which of the following also exist in the nucleus? (a) A beta particle (b) An alpha particle (c) A neutron (d) An electron

20. The silver wall of a vacuum flask prevents heat loss due to (a) conduction (b) convection (c) radiation (d) diffraction

21. The electromagnetic waves that are sensitive to temperature changes are (a) ultra-violet rays (b) gamma-rays (c) infra-red rays (d) x-rays

22. Under constant tension and constant mass per unit length, the note produced by a plucked string is 500 Hz when the length of the string is 0.90m. at what length is the frequency 150Hz? (a) 6m (b) 3m (c) 5m (d) 4m

23. Two bodies P and Q are projected on the same horizontal plane, with the same initial speed but at different angles of 30° and 60° respectively to the horizontal. Neglecting air resistance, what is the ratio of range of P to that of Q? (a) 1:1 (b) 1: $\sqrt{3}$ (c) $\sqrt{3}$: 1 (d) 1:2

24. A capacitor of 2.0 x 10^{-11} F and an inductor are joined in series. The value of the inductance that will give the circuit a resonant frequency of 200 kHz is (a) $\frac{1}{16}H$ (b) $\frac{1}{8}H$ (c) $\frac{1}{64}H$ (d) $\frac{1}{32}H$

SOLUTION TO PHYSICS 2007
1.A 2.B 3.A 4.A 5.B 6.A 7.D 8.D 9.D 10.A 11.B
12.A 13.B 14.C 15.C 16.E 17.E 18.B 19.C 20.C
21.C 22.B 23.A 24.D

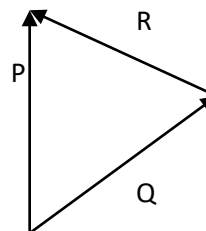## OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2006 POST-UME SCREENING EXERCISE - PHYSICS

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2. An electric kettle with negligible heat capacity is rated at 2000W. If 2.0Kg of water is put in it, how long will take temperature of water to rise from 20°C to 100°C? [*Specific heat capacity of water = 4200 J Kg⁻¹ K⁻¹*] A. 336 B. 420s C. 168s D. 84s

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4. The scent from a jar of perfume opened in one corner of a room is picked up in another part of the room. The perfume moves through the air molecules by A. Evaporation B. Osmosis C. Diffusion D. Convection.

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6. A diverging lens of focal length 20cm forms an image halve of the size of the object. What is the object distance? A. 11.11cm B. 100cm C. 60cm D. 8.71cm.

7. An object of height 3.00cm is placed 10cm in front of a biconvex lens of focal length 15cm. The image of the object is A. Real and 3.00 cm tall B. Virtual and 3.00cm tall C. Virtual and 9.00cm tall D. Real and 9.00cm tall.

8. The most suitable type of mirror used for the construction of a searchlight is the A. Concave mirror B. Spherical mirror C. Convex mirror D. Parabolic mirror

9. Light waves and ripples of water are similar because both A. are longitudinal waves B. can be diffracted and refracted C. have the same velocity D. have the same frequency.

10. A body accelerates uniformly from rest at 6ms⁻² for 8 seconds and then decreases uniformly to rest in the next 5seconds. The magnitude of the deceleration is: A. 9.6ms⁻² B. 48ms⁻² C. 24.0ms⁻² D. 39.4ms⁻²

11. A nail is pulled from a wall with a string tied to the nail. If the string is inclined at an angle of 30° to the wall and the tension in the string is 50 N, the effective force used in pulling the nail is: A. 25N B. 25√3 N C. 50 D. 50√3N

12. A 70kg man ascends a flight of stairs of height 4 m in 7s. The power expended by the man is: A. 40 W B. 100 W C. 280 W D. 400 W.

13. Which of the following statements is not true? A. As the slope of an inclined plane increases, the velocity ratio decreases. B. The efficiency of an inclined plane decreases as the slope increases. C. The effort required to push a given load up an inclined plane increases as the slope increases. D. The mechanical advantage of a smooth inclined plane depends on the ratio of the length to the height of the plane.

14.

In the diagram above, P, Q and R are vectors. Which of the following options gives the correct relationship between the vectors? A. P = R – Q B. P = R + Q C. P = Q- R D. P + R + Q = 0

15. If *M* and *R* are the mass and radius of the earth respectively and *G* is the universal gravitational constant, the earth's gravitational potential at an altitude *H* above the ground level is: A. –GM/H B. –GM/(R+H) C. –GM/2H D.-GM(R-H)

16. The equation $^{150}_{62}X \rightarrow ^{150}_{63}Y + k^0_{-1} +$ energy, representA.α-decay B. β-decay C. γ-decay D. photon emission

17. Which of the following radiations cannot be deflected by an electric field or a magnetic field? A. a-rays, (ii) β-rays (iii) γ-rays (iv) X-rays B. (i) and (ii) only C. (iii) and (iv) only D. (i) and (iii) only.

18. The half-life of a radioactive element is 9 days. What fraction of atoms has decayed in 36 days? A. $\frac{1}{16}$ B. $\frac{1}{4}$ C. $\frac{1}{2}$ D. $\frac{15}{16}$

19. Three 4-Ω resistors were connected in series by 'Tola while Ade connected the same set of resistors in parallel. The ratio of the value obtained by Ade to that obtained by 'Tola is A. 1:2 B. 1:9 C. 1:10 D. 1:5

20. Three resistors are connected as shown in the diagram below. The equivalent resistance between points X and Y is

(a) 8.0Ω (b) 4.25Ω (c) 22.0Ω (d) 3.27Ω
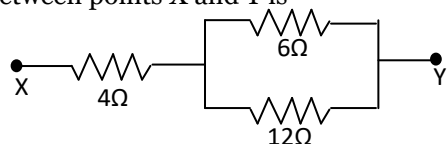
SOLUTION TO PHYSICS 2006

1.C 2.A 3.A 4.C 5.C 6.C 7.C 8.D 9.C 10.A 11.A
12.D 13.D 14.B 15.B 16.B 17.C 18.B 19.D 20.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2015 POST-UME SCREENING EXERCISE
GEOGRAPHY

1. The major source of tropical hardwood for timber production is the A. Mangrove swamp forest B. coniferous forest C. Tropical deserts D. Rain forest
2. A settlement existing primarily for people to enjoy their leisure is known as a A. Game town B. Cultural town C. Conurbation town D. Resort tworn
3. Which of the following is not a rapid type of mass movement? A. Mudflow B. Earth flow C. Solifluction D.Debris avalanche
4. Which of the following is not a rapid type of mass movement? A. Lateral erosion B. Rapid and waterfalls C. Interlocking spurs D. Vertical erosion
5. Based on Richter Scale, earthquake result in distinct shaking and collapse of less well-constructed buildings from A. Log-scale 2 B.Log-scale 3 C.Log-scale 4 D. Log-scale 5
6. Which of the rivers crossed the equator twice? A. River congo B. River Nier C. River Nile D. River Zambez
7. If an international football match is scheduled to start by 6:00pm on Wednesday October 14,2015 in location X (longitude 25°E), at which time and date would people in location Y (Longitude 260°E) be able to listen or watch the start of the match? A. 9.40am on Thursday October 13,2015 B.1:00pm on Thursday October 13, 2015 C.11.00pm on Tuesday October 13, 2015
8. Which of the following states of the atmosphere is antagonistic to precipitation formation and pollution dispersal? A. Absolute stability B. Instability C. Convective instability D. Conditional instability
9. Which of the following is a cold ocean current? A. Oyashio current D. North Atlantic Drift C. South Equatorial current D. North equatorial current
10. What is the centigrade equivalent of 158 degree Fahrenheit? A. 205.56 degree Centigrade B. 70 degree Centrigrade C. 326.4 degree Centigrade D. 252.4 degree Centigrade
11. The effect of earth's rotation include the following except A. Day and Night B. Time differences from place to place C. Changes in the altitude of midday sun D. Deflection of winds and ocean curents
12. Terracing in agriculture is practiced A. On top of plateaus B. On the steep slope of escarpment C. On dry lands D. On waterlog areas
13. Which of the following terms is associated with glaciations? A. Zeugen B. Arete C. Dolines D. Mesa
14. Which of the following is not a renewable energy? A. Wind energy B. Solar energy C. Hydroelectric power D. Fossil fuel
15. Which of the following tourist centres in Nigeria is the larges? A. Yankari Game Reserve B. Kainji National Park C. The Mambila Plateau D. Obudu Cattle Ranch
16. Whidh of the following wrongly paired? A. Ahanti of Ghana B. Wolof of Gambia and Senegal C. Dru of Southern Liberia and Southwest Cote d'Ivoire d. Mossi f Sierra Leone
17. Which of the following Africa countries has the largest expanse of tropical rain forest? A. Nigeria B. Zaire C. Cote'd'Ivoire D. Ghana
18. Which of the following gases constitutes the least percentage by volume in the earth's atmosphere A. oxygen B. Ozone C. Nitrogen D. Argon
19. In a typical soil profile, the zone of illuviation is also known as A. Horizon B B. Horizon C C. Horizon D D. Horizon
20. Which of the following African countries has the longest coastline? A. Somalia B. Angola C. Kenya D. Sudan
21. Vauclusian spring are also called A. Resurgent streams B. Perennial streams C. Seasonal springs D. Permanent springs
22. In which of the following countries is most extensive area of loess deposit found? A. China B.Canada C. United States D. United Kingdom
23. Where is the phenomenon of Little Dry Season (August Break) most evident in Nigeria? A. Southwest B. South east C. Northwest D. Northeast
24. Which of the following hydrological centres in Nigeria is most extensive? A. North Central Plateau B. Western Highlands C. Eastern Highlands D.Udi Plateau
25. Which of the following tropical cyclones is most violent? A. Wily Wily B.Typhoon C. Tornado D. Hurricane

SOLUTION
1.D 2.D 3.C 4.C 5.A 6.A 7.C 8.A 9.   10.B 11.C 12.B 13.D 14.D 15.A 16.D 17.B 18.D 19.B 20.A 21.A 22.A 23.A 24.A 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2014 POST-UME SCREENING EXERCISE
GEOGRAPHY

1. Which of the following in Nigeria has the least mean annual rainfall total? A.Sokoto B. Nguru C. Kano D. Maidunuri
2. Nigeria's Federal Capital territory shares boundaries with the following states except A. Plateau B. Niger C. Kogi D.Kaduna
3. Which of the following is not a major fold mountain of the world? A. Himalayas B. Andes C. Atlas D. Krakatoa
4. The relief period between sunset and the complete darkness of nigh is known as A. Dawn B. Solstice C. Twilight D. Night

5. If an international football match is schedule to start by 2.00pm on Monday 21 September 2014 in location A (longitude 5°E), at what time and date would people in location B (longitude 295°W) be able to listen or watch of the start of the match? A. 5.40pm on Sunday 20 September, 2014 B. 7.00pm on Sunday 20 September, 2014 C.10.00 am on Tuesday 22 September, 2014   D. 8.40am on Tuesday 22 September, 2014

6. Which of the following is not associated with youthful stage of a river?   A. Narrow valley B. Rapid and water falls   C. Braided channel D. Port holes

7. Which of the following gases constitutes the largest percentage by volume in the earth's atmosphere? A. Oxygen B. Carbon dioide C. Nitrogen D. Argon

8. Which of the following is not a warm ocean current? A. North equatorial current   B. South equatorial current C. North Altlantic drift D. Peruvian current

9. Which of the following is not an element of climate? A. Precipitation B. Evaporation C. Temperature D. Humidity

10. What is the Fahrenheit equivalent of 95 degree Centrigrade?   A. 203 degree Fahrenheit   B. 51 degree Fahrenheit C. 84.78 degree Fahrenheit D. 139 degree Fahrenheit

11. Which of the following temperate grasslands is wrongly paired with its location? A. The Downs of Australia   B. Prairies of Canada and USA C. The pampas of Argentina D.The Steppe of South Africa

12. Which of the following is not true of Anticyclone? A.A region of relatively low atmospheric pressure B. Blowing clockwise in the northern hemisphere C. Blowing anticlockwise in the South hemisphere D. It is also refers to simply as a 'HIGH'.

13. Which of the following vegetation belt houses the largest concentration of domesticated livestock in A. sahel B. Sudan savanna C. Montane grassland D. Forest

14. Which of the following is the cause of the deflection of all feely-moving bodies (e.g. wind and ocean currents) to the right of their paths in the northern hemisphere and left in the southern hemisphere? A. The differnces in air pressure B. The revoltion of the earth   C. The rotation of the earth D. The big size of the earth

15. All of the following are measures of combating soil erosion except   A.Terracing   B.Cover crops C.mining D. Contour ploughing

16. The state of the equilibrium reached by the vegetation of an area when it is left undisturbed for a long period of time is called A. Tropical level B.Ecosystem C. Climax D. Phyletic origin

17. Which of the following is not a prominent process of wind erosion in the desert?   A. Deflation B. Abrasion C. Attrition D. Solution

18. In which of the following latitudes would you expect more than 24 hour of continuous daylight or darkness at a particular time of the year? A. 70°N and SB. 50°N and S C.45° and S D.23.5°N and S

19. One of the major mineral deposits found in Jos plateau is A.Gold B. Coal C. Lignite D. Columbite

20. "Transhumance" is   A. Rearing of animal which involves seasonal movement of animals up and down hills slopes in search of pasture B. Animal rearing which involves movement of farmers from the coast inland C. Animal rearing which involves movement of farmers from desert to the coast D. Animal rearing in which farmers stay permanently over a location

21. The movement of people from a village to a farm settlement can be described as   A. Rural-urban migration B. Rural-rural migration C. Suburban-rural migration D. Urban-urban migration

22. In which of the following rock types is petroleum mainly found? A. Igneous   B. Sedimentary C. Volcanic D. Metamorphic

23. Under which of the following atmosphere condition is pollution forced to spread horizontally near the earth's surface rather than rising vertically through the atmosphere?   A. Convectively unstable atmosphere B. When the environmental lapse rate greatly exceeds the adiabatic lapse rate   C. Absolutely unstable atmosphere   D.Temperature invation

24. The world's richest fishing ground are found A. On the continental shelves   B. On the deep seas platforms C. In oceanic deep D. In river estuaries

25. Which of the following African cities is situated near the confluence of rivers?   A. Niamey   B. Cairo C.Port-Harcourt D. Khartoum

SOLUTION
1.D 2.A 3.D 4.C 5.A 6.C 7.C 8.D 9.B 10.A 11.D 12.A 13.B 14.C 15.C 16.C 17.D 18.A 19.D 20.A 21.B 22.B 23.D 24.A 25.D

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2013 POST-UME SCREENING EXERCISE
GEOGRAPHY

1. The second Equinox in any year takes place during the month of (a) March (b) June (c) September (d) December
2. Which one of the following countries in Africa would a person NOT pass over by crow fly (direct distance) from Abidjan to Cairo? (a) Niger (b) Libya (c) Burkina Faso (d) Chad
3. The main work of a river in its torrent stage is (a) widening its valley (b) down cutting (c) deposition (d) bifurcation
4. Which of the following locations in Nigeria has the highest mean annual rainfall total? (a) Benin City (b) Port-Harcourt (c) Calabar (d) ondo
5. The world's longest river is (a) River Amazon (b) River Mississippi (c) River Nile (d) River Chang Jiang
6. Which of the following is a feature of a rejuvenated river? (a) Incised Meanders (b) Braided Chanel (c) Delta (d) Levees
7. Which of the following is not a thermometric scale? (a) Celsius (b) Kelvin (c) Fahrenheit (d) Octas
8. Which of the following is not a form of condensation? (a) Snow (b) Rime (c) Cloud (d) Fog
9. The surface of discontinuity between the earth's crust and the mantle is known as (a) Lithosphere (b) Barysphere (c) Mohocivic discontinuity (d) Gutenburg discontinuity
10. Where is Sahel Savanna vegetation belt found in Nigeria? (a) Northwest (b) Northeast (c) both Northwest and Northeast (d) from the middle belt to the north
11. The largest soil group, found in the temperature grasslands, having a deep, black, nutrient-rich A-horizon, a compact B-horizon and a zone of calcium carbonate accumulation is called a (a) Chemozem (b) Pedocal (c) Podsol (d) Chestnut
12. Drought-tolerant plants are known as (a) epiphytes (b) hydrophytes (c) drouphytes (d) xerophytes
13. The major disadvantage of the River Nile as a trade route is that (a) it is too long (b) it is to shadow (c) it flows during the wet season only (d) it has several cataracts
14. The earth rotates from (a) Southeast to Southwest (b) Southwest to Southeast (c) West to East (d) East to West
15. The tropical maritime air mass attains its maximum incursion over West African hinterlands (a) when the sun is overhead on the tropic or Capricorn (b) when the sun is overhead on the tropic of Cancer (c) when the sun is overhead on the Equator (d) when the sun is overhead on both the tropic of Cancer and Tropic of Capricorn
16. A line joining places of equal salinity is known as (a) Isohaline (b) Isoneph (c) Isohyet (d) Isohel
17. Which of the following continents has the largest area with a tropical type of climate? (a) Asia (b) South America (c) North America (d) Africa
18. One hour's difference in mean solar time represents what angular difference in longitude? (a) 15° (b) 23.5° (c) 90° (d) 66.5°
19. An extended urban area, typically consisting of several towns merging with the suburbs of one or more cities can best be referred to as (a) conurbation (b) urban decay (c) growth pole (d) urban inertia
20. Which of the following terms is not associated with desert-type topography? (a) Zuegen (b) Yardang (c) Mesa (d) Uvala
21. The major characteristics of a karst scenery include (a) excessive overland flow (b) extensive and long surface flow (c) an underground network of caves and streams (d) frequent surface drainage
22. Which of the following landforms originates from Aeolian erosion? (a) deflation hollow (b) snad dune (c) playa (d) Wadi
23. The cheapest means of transport for a long distance travel is by (a) air (b) rail (c) water (d) road
24. A traveler crossing the international date line from America to Asia at 1.00pm on Saturday, July 13th, 2013, would have to change his watch to 1.00pm on (a) Sunday, July 14th, 2013 (b) Friday, July 12th, 2013 (c) Saturday, July 13th, 2013 (d) Monday, July 15th, 2013
25. The shaduf method of irrigation was first practiced in (a) Sudan (b) Ghana (c) Egypt (d) Mali

ANSWERS TO GEOGRAPHY 2013

1.C 2.C 3.A 4.B 5.C 6.A 7.D 8.D 9.B 10.B 11.A 12.D 13.D 14.C 15.C 16.A 17.A 18.A 19.A 20.D 21.C 22.A 23.C 24.A 25.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2012 POST-UME SCREENING EXERCISE
GEOGRAPHY

1. Which of the following is not a rapid type of mass movement? (a) Solifluction (b) Rockfall (c) Mudflow (d) Debris Slide
2. A front in which warm air is overtaken and lifted off the ground by cold air in a depression is known as (a) Cold front (b) Warm front (c) Mixed front (d) Occluded front
3. The earth's atmosphere is said to be stable (a) When the environmental lapse rate is greater than the adiabatic lapse rate (b) When the adiabatic lapse rate is greater than the environmental lapse rate (c) When the environmental lapse rate is equal to the adiabatic lapse rate (d) When the environmental lapse rate is not equal to the adiabatic lapse rate
4. Environmental lapse rate is (a) The rate of temperature changes of an air parcel undergoing vertical displacement (b) The rate of temperature decrease of an air parce1 undergoing horizontal displacement (c) The actual rate of decrease of temperature with increase in altitude at a given place at a given moment (d) The rate of horizontal temperature gradient of an a parcel
5. What is the Centigrade equivalent of 95° Fahrenheit? (a) 139°C (b) 37.2°C (C) 35°C (d) 36°C

6. Which one of the following States in Nigeria would a person NOT pass over by crow fly (direct distance) from Ibadan to Makurdi? (a) Osun (b) Ondo (c) Kogi (d) Enugu
7. The latitude which marks the limits of is overhead sun's apparent movement is (a) 0° (b) 66.5° (c) 32.5° (d) 23.5°
8. Which of the following features is not commonly associated with a river at the floodplain stage? (a) Meanders (b) Levees (c) Braided channel (d) knickpoint
9. The world's richest fishing grounds are found (a) On the continental shelves (b) In oceanic deeps (c) In big and fast-flowing river (d) In river estuaries
10. A deflation hollow is produced by (a) River erosion (b) Water action in a limestone area (c) Wind erosion in deserts (d) Wave erosion on the coast
11. Akosombo dam is on the River (a) Niger (b) Nile (c) Congo (d) Volta
12. Which of the following is not characteristic of the International Date Line? (a) The line is approximately along the 180° meridian (b) The line has a zigzag shape (c) Local time is the same on either side of the line (d) a traveler gains a day when crossing the line from the west to the east
13. Which of the following African cities is situated near the confluence of rivers? (a) Niamey (b) Freetown (c) Cairo (d) Khartoum
14. Ferrel's law states that winds deflect to the (a) Left in the northern hemisphere and to the right in the southern hemisphere (b) Right in the northern hemisphere and to the left in the southern hemisphere (c) Right in both hemispheres (d) Left in both hemispheres
15. Given an environmental lapse rate of 0.65°C period metres, a place with sea level temperature of 40°C and 2500 metre above the sea level will approximately level a temperature of (a) 31.25°C (b) 23.75°C (c) 2.5°C (c) 28.25°C

16. At the summer solstice (June 21), which of the following latitudes will have the shortest night? (a) 30°N (b) 30°S (c) 50°N (d) 50°S
17. Which of the following landforms results from wind deposition? (a) Playa (b) Barchan (c) Bajada (d) Fan
18. Which of the following farming practices can be used to check soil erosion? (a) Contour ploughing (b) ploughin of land upslope (c) bush burning (d) shifting cultivation
19. Aeolian erosion refers to the work of (a) Plants (b) Wind (c) ice (d) Running water
20. The difference in the readings on the dry and wet bulb thermometers used to determine (a) Relative humidity (b) Temperature range (c) Evaporation (d) Transpiration
21. Which of the following scales should show the greatest amount of detail on a map? (a) 1:50,000 (b) 1:500,000 (c) 1:20,000 (d) 1:200,000
22. Sandstone is metamorphosed into (a) Slate (b) Quartzite (c) Schist (d) Graphite
23. In humid areas, farmers add lime to the soil to (a) Reduce acidity (b) Act as fertilizer (c) Facilitate the absorption of nutrients (d) Encourage the farmers
24. In the hydrological cycle, the transfer of water from the earth's surface to the atmosphere is by (a) Evaporation only (b) Transpiration only (c) Evapotranspiration (d) Condensation
25. In which of the following countries was the shaduf method of Irrigation first practiced? (a) Niger (b) Egypt (c) Sudan (d) Ghana

ANSWERS TO GEOGRAPHY 2012
1.A 2.D 3.B 4.C 5.C 6.D 7.D 8.A 9.A 10.C 11.D 12.C 13.D 14.B 15.B 16.C 17.B 18.A 19.B 20.A 21.C 22.B 23.A 24.C 25.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE
2011 POST-UME SCREENING EXERCISE
GEOGRAPHY

1. Soils that are formed by wind deposition are called A. laterites B. prairies C. podsols D loess E. horizons
2. Which of the following is not a feature of sea deposition? A. Shoal B. Beach C. Spit D. Bar Stack
3. Which of the following terms is associated with glaciations? A. Arete B. Bay C. Stacks D. Reef E. Dohnes
4. The lower part of a river valley that has been submerged by the sea is called A. Estuary B. Reef C. Spit D. Bar E. Beach
5. Which of the following is a cold ocean current? A. Mozambique B. Gulf Stream C. Kuro Siwo D. Benguela E. North Atlantic Drift
6. The most important cause of tides is the, A. distribution of the prevailing winds B. rotation of the earth on its own axis C. inclination of the earth's axis D. gravity attraction of the moon E. revolution of the earth
7. Desert soils are usually deficient in A. fertility B humus content C. horizon D. light grey colour E. influence of parent material

8. At the summer solstice (June 21st), which of the following latitudes will have the longest day? A 70°S B 90°S C 30°N D 65°N E 80°S
9. Cyclones refer to A. centres of relatively high pressure B. centres of relatively low pressure C. centres of Tsunamis D. centres in the desert E. centres over the ocean
10. The wearing away of the sides and bottom of a river's channel is called A. corrasion B. corrosion C. hydraulic action D. complicated erosion E. attrition
11. When the moon comes in between the earth and the sun in a straight line, it is known as A Solar eclipse B. Eclipse of the earth C. Eclipse of the moon D. Lunar eclipse E. Universal eclipse
12. A degree of latitudinal distance is approximately A. 111km B. 221km C. 121km D. 212km E. 144km
13. Which of the following places in Nigeria has the highest mean annual rainfall amount? A. Sokoto B. Maiduguri C. Nguru D. Kane E. Katsina
14. The formulae for converting temperature from a Centigrade (°C) to a Fahrenheit (°F) thermometric scale? A.°F = 1.8 x °C + 32 B. °F = 0.5 x °C + 32 C.

°F = 1.8 x °C − 32 D. °F = 0.5 x °C − 32 E. °F = 1.8 x °C + 23

15. The Northern Hemisphere's Spring Equinox is during the month of A. February B. March C. April D. May E. June
16. Noonday sun is vertically overhead along the Tropic of Cancer during the month of A. June B. July C. August D. September E. December
17. An instrument used in measuring the atmospheric pressure is called A. Barometer B. Thermometer C. Micrometer D. Hygrometer E. Presometer
18. Orographic rainfall is also called A. Relief rainfall B. Cyclonic rainfall C. Convectional rainfall D. Frontal rainfall E. Orogenic rainfall
19. The forest type which is richest in tree species is the A. Deciduous forest B. Mediterranean forest C. Tropical Lowland Rainforest D. Coniferous forest E. Thorn forest
20. Which of the following statements is not true for lines of latitude? A. They range from 0° to 180° north and south B. They range from 0° to 90° north and south C. They vary in D. They form parallel circles E. Only one line is a Great Circle.
21. The earth rotates through 15° of longitude in A. 24hours B. l5hours C. 4hours D. 2hours E. an hour
22. What is the local standard time in New York (75°W) when it is 2.00p.m. in Accra? A. 9.00p.m. B. 9.00am. C. 7.00p.m. D. 7.00a.m. E. 8.00p.m.
23. Aeolian erosion refers to the work of A. Wind B. Running water C. Glaciers D. Ice E. Man
24. Which of the following landforms is the result of river rejuvenation? A. ox-bow lake B. flood plain C. terrace D. alluvial fan E. delta
25. The representative fraction of 1:50,000 can be converted to the following statement: A. one cm to 5km B. one cm to 0.5km C. one cm to 2km D. one cm to 4km E. one cm to lkm

ANSWERS TO GEOGRAPHY 2011

1.D 2.E 3.A 4.B 5.D 6.D 7.B 8.D 9.B 10.A 11.A 12.A 13.C 14.A 15.B 16.A 17.A 18.A 19.C 20.A 21.E 22.B 23.A 24.C 25.B

OBAFEMI AWOLOWO UNIVERSITY ILE IFE, 2010 POST-UME SCREENING GEOGRAPHY

1. All planets have satellites except: (a) Earth & Venus (b) Mars & Mercury (c) Mercury & Venus (d) Neptune & Venus
2. Which of the following locations in Nigeria has the least mean annual rainfall total? (a) Sokoto (b) Maiduguri (c) Potiskurn (d) Nguru
3. Which of the following is not the karst features? (a) Poljes (b) Uvala (c) Kopjes (d) Dolines
4. The world's longest river is (a) Amazonb (b) Mississippi (c) Nile (d) Chang Jiang
5. One of these is a feature of a rejuvenated river: (a) incised meanders (b) braided channel (c) delta (d) levees
6. Which one of these is not is a thermometric scale: (a) Celsius (b) Kelvin (c) Fahrenheit (d) Octas
7. Which of these is not a form of condensation? (a) Snow (b) Rime (c) Cloud (d) Fog
8. Cyclones are centres of (a) relatively low pressure (b) relatively high pressure (c) Tsunamis (d) turning around of winds
9. The best natural harbour in West Africa is at (a) Lome (b) Tema (c) Lagos (d) Freetown
10. Sandstone is metamorphosed into (a) Slate (b) Schist (c) graphite (d) Quartzite
11. The navigability of River Nile is limited because (a) it is too long (b) It is too shallow (c) it flows during the wet season only (d) it has several cataracts
12. The cloud which is closely associated with thunderstorms is (a) strato-cumulus (b) Cirrocumulus (c) Cumulus-nimbus (d) Alto-stratus
13. Drought-tolerant plants are (a) Epiphytes (b) Hydrophytesc (c) Droughytes (d) Xerophytes
14. Campos is the name for the grassland in (a) North America (b) South America (c) Africa (d) Asia
15. When the moon comes in between the earth and the sun in a perfect straight line, it is known as (a) Eclipse of the moon (b) lunar eclipse (c) solar eclipse (d) Eclipse of the earth
16. The earth rotates (a) South East-South West (b) South West-South East (c) West-East (d) East-West
17. A degree latitudinal distance is approximately (a) 70km (b) 111km (c) 180km (d) 360km
18. Large masses of moving ice in the oceans are (a) glacier (b) iceberg (c) ice-sheet (d) ice-caps
19. The world driest desert is (a) Atacama (b) Sahara (c) Kalahari (d) California
20. A line joining places of equal salinity is (a) Isohaline (b) Isoneph (c) isohyets (d) Isohel
21. Which of these is not on the western side of continental land masses? (a) Agulhas (b) Canary (c) Penivian (d) California
22. In general, temperature decreases from the equator towards the Poles because (a) angle of incidence of sun's rays increases towards the poles (b) angles of incidence of sun's rays decreases towards the pole (c) snow-cover of the higher latitudes reduces the temperature (d) snow falls rather than rain in the poles
23. Which of the following continents is crossed by both the Tropic of Cancer and Tropic if Capricorn? (a) Asia (b) S. America (c) N. America (d) Africa
24. The sea bed, bordering the continents which is covered by shallow water is known as (a) continental slope (b) coral reef (c) continental shelf (d) continental platform (e) continental drift
25. The result of a football match completed at 6.00pm at Accra (Ghana) and immediately announced over the wireless was heard at 12.00noon same day at another city. The longitude of the city is (a) 90°E (b) 60°E (c) 90°W (d) 45°W (e) 60°W

ANSWERS TO GEOGRAPHY 2010

1.C 2.B 3.C 4.C 5.A 6.D 7.B 8.A 9.D 10.D 11.D 12.C 13.D 14.B 15.C 16.C 17.B 18.B 19.A 20.A 21.A 22.A 23.D 24.C 25.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2009 POST-UME SCREENING
GEOGRAPHY

1. Which of the following features is produced by wave deposition (a) caves (b) stack (c) tomobolo (c) blow holes
2. Which of the, following is the major factor responsible for Japan's unparalleled industrial growth in the last few decades? (a) Japan's proximity to mainland (b) Japan's cargo population (c) availability of abundant coal and petroleum (d) technological proficiency
3. Which of the following timber trees are found in the tropical rain forest of Africa? (a) Obeche and teak (b) Mahogany and teak (c) Obeche and Mahogany (d) Iroko and Eucalyptus
4. Which of the following river basins has the highest population concentration? The (a) Indus (b) Niger (c) Nile (d) Mississippi
5. Which of these economic activities is LEAST characteristics of typical urban centre? (a) commerce (b) quarrying (c) transportation (d) manufacturing
6. In Karst region, when several dolines are joined together to form depression, it is known as (a) cave (b) uvala (c) stalactite (d) calcite pallar
7. Rural settlements can best be distinguished from urban settlements by their? (a) function and population (b) site and function (c) demography and morphology (d) morphology and location
8. The scientist who propounded the theory of continental drift was? (a) Francis bacon (b) Alfred Wegener (c) Authur Holmes (d) Williams Davis
9. The major world exports of wool are (a) Britain, Australia, Mediterranean Europe and Argentina (b) New Zealand, Uruguay, Australia and Argentina (c) Australia, India, Paraguay and Argentina (d) New Zealand, India, Uruguay and Peru
10. Blantyre, Rio Janeiro, New York and Lagos are similar in that they all serve as their countries (a) major seaport (b) political headquarter (c) commercial centers (d) cultural centers
11. The dawn is a temperate grassland found in? (a) Australia (b) South America (c) Eurasia (d) South Africa
12. Commercial grape cultivation is associated with? (a) cool temperature climate (b) monsoon regions (c) Mediterranean regions (d) Montane climate
13. The highest volume of shipping across the Atlantic ocean is (a) between Europe and Africa (b) between North America and Europe (c) between Africa and South America (d) between North America and South America
14. The Ukraine of economic activities (a) commercial grain agriculture and livestock ranching (b) plantation agriculture and nomadic herding.

ANSWERS TO GEOGRAPHY 2009
1.C 2.D 3.C 4.B 5.B 6.B 7.A 8.B 9.B 10.C 11.A 12.C 13.B 14.A

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2008 POST-UME SCREENING
GEOGRAPHY

1. Oxbow lakes are found in (a). lower courses of some rivers (b) wind bow out sites (c) places with history of tectonism (d) areas of subsidence
2. Coombes are associated with (a) honey-bee farms (b) Karst environment (c) rift valley systems (d) cases in the desert
3. The Stevenson's screen is used to keep (a) barometers (b) thermometers (c) hygrometers (d) evapori meters
4. Global Positioning Systems (GPS) help in (a) combating crime (b) providing early warnings against disasters (c) climate change monitoring (d) locating positions on the earth surface
5. One of this is not a factor of population growth (a) poverty (b) migration (c) prosperity (d) housing
6. Which of the following is not a major problem of Kainji Dam? (a) increase in the herds of cattle that depend on is waters (b) increase in usage of Niger in Niger Republic (c) silting of the dam (d) growing demand for irrigation water
7. The East Africa large lakes are together described as (a) Gieat Lakes St Lawrence Sea Ways (b) Rift Valley Lakes (c) Sources of large rivers like Nile (d) products of the formation of Mt Kilimanjaro
8. One of these is not true of rain gauges: (a) Rain gauges provide excellent measurement of rainfall (b) Their measurements may be affected by the particular type used (c) Their readings may be influenced by slope of the land (d) Rain splashes during heavy rains may lead to over estimation
9. South East Asia is noted for its regular experience of (a) hurricane (b) tornadoes (c) typhoons (d) strong winds
10. Horse latitudes refer to (a) areas around the gulf of guinea (b) areas around the equator (c) areas around the Mediterranean sea (d) areas around latitude 30° in both hemispheres.
11. "High uniform temperature and heavy well distributed rainfall throughout the year" describe (a) Equaterial rainforest climate (b) Mid altitude friendly environment (c) the zone of forest with a lot of agricultural potentials (d) the greet Amazon basin including the Brazilian forests.
12. One of the following is least important to ocean movement (a) salinity of the ocean water (b) temperature of the water (c) planetary winds (d) curvature of the coastal areas
13. The cloud which are white globular masses, forming ripples in the sky is called (a) Citrus (b) Cirrocumulus (c) altocumulus (d) altostratus
14. Which one of the following seas has the highest degree of salinity in the world? (a) Capian sea (b) Mediterranean sea (c) Dead Sea (d) Red Sea
15. Which of the following landforms is NOT due to the process of glacier erosion? (a) Come (b) Valley-bench (c) Hanging valley (d) Esker

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16. Which of the following rivers does NOT drain into the Atlantic Ocean? (a) The Niger (b) The Indus (c) The Amazon (d) The Volta
17. Which features on a topographical sheet would you analyze to characterize the configuration of the area covered by the sheet (a) Isoyet and isolines (b) ranges and spot heights (c) contour liens for cross section (d) contour liens for slope estimates
18. The greatest challenge to future use of automobiles is (a) advances in air travels (b) identification of alternative to fossil fuels (c) changing and more reliable technology for rail transport (d) population growth
19. The statement 'one cm to 2 km' can be represented by the ratio of (a) 1:50,000 (b) 1: 500,000 (c) 120,000 (d) 1: 200,000
20. What is the local standard time in New York (750W) when it is 2 p.m. in Accra? (a) 7 p.m.(l9hrs) (b) 7 a.m. (0700hrs) (c) 9 p.m. (2100 hrs) (d) 9 a.m. (0900 hrs)
21. On any day in the year at a specific time (a) the sun is overhead along the equator (b) the sun is overhead along the tropic of cancer (c) the North Pole has 24 hours of daylight (d) one half of the earth is in darkness
22. Which of the following is not a feature produced by volcanic activity? (a) horst (b) caldera (c) dyke (d) geyser
23. Which is the main crop grown in the Ghezira plains (a) Wheat (b) Millet (c) Rice (d) Cotton
24. Which of the following countries has a large number of people of Africa descent? (a) England (b) Canada (c) Chile (d) Brazil
25. When it is 1200 noon on longitude 30°E. What is the time on longitude 15°W. (a) 9.00 a.m. (b) 9.00 p.m. (c) 5.00 p.m. (d) 5.00 a.m.
26. Which of the following Nigerian towns is Not situated near a big river? (a) Lokoja (b) Onitsha (c) Jebba (d) Abuja
27. Fishing is the mainstay of the economy of (a) Libya (b) Iran (c) Iceland (d) Chad

ANSWERS TO GEOGRAPHY 2008
1.A 2.B 3.B 4.D 5.A 6.B 7.B 8.C 9.C 10.D 11.A 12.D 13.B 14.C 15.D 16.B 17.D 18.B 19.D 20.D 21.D 22.A 23.D 24.D 25.A 26.D 27.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2007 POST-UME SCREENING
GEOGRAPHY

1. At what time of the day will a traveller reach Gatwick airport in London if he leaves Nigeria at 5am on a 6hr flight during the winter? (a) 11.00hr (b) l2.00hr (c) 15.00hr (d) 13.00hr
2. Which of the following is not an Anglophone country (a) Ghana (b) Gambia (c) Liberia (d) Senegal
3. The shallow part of the sea which separates the deep from the land is called (a) off shore coastal lowland (b) the on shore tidal current (c) continental shelf formation (d) coastal coral cliff
4. The port that handles the highest volume of cocoa export in Nigeria is (a) Sapele (b) Warn (c) Lagos (d) Port Harcourt
5. One major characteristics of rural settlements is that (a) are heterogeneous (b) are homogenous (c) are large in size (d) have more problems than urban settlements
6. Industrialization in Nigeria can best be promoted through the development of (a) textile industry (b) leather industry (c) iron and steel industry (d) automobile industry
7. Most of the industries located in rural areas are (a) low energy consumers (b) high energy consumers (c) raw materials oriented (d) transport oriented
8. The distribution of mineral resources in Nigeria is related to its: (a) relief (b) soil (c) vegetation (d) geology
9. Which of the ocean currents is classified as cool? (a) Benguela (b) Kuro Siwo (c) Gulf Scream (d) Mozambique
10. The sea area with the highest degree of salinity is the (a) Baltic Sea (b) Caspian Sea (c) Dead Sea (d) Mediterranean Sea
11. The thermometric scale usually employed to describe the absolute temperature of the atmosphere is (a) Centigrade (b) Celsius (c) Kelvin (d) Fahrenheit
12. If the temperature at sea level in a particular place is 20°C, place 3500 m above sea level in the same area will have a temperature of (a) -2.75°C (b) 2.25°C (c) 2275°C (d) 22.75°C
13. Which of the following is not a form of precipitation? (a) Dew (c) Snow (c) hail (d) fog
14. Which of the following pressure belts does not experienced descending air? (a) 60°N (b) 60°S (c) 0° latitude (d) 30°N
15. In the Tropics, the most variable climatic element inter-annually is (a) temperature (b) solar radiation (c) pressure (d) prairies
16. Soils that are formed by wind deposition are called (a) laterites (b) loess (c) podsols (d) prairies
17. Desert soils are usually deficient in (a) fertility (b) light grey colour (c) humus content (d) horizons
18. Podsols and laterites share the following characteristics in common, except (a) infertility (b) high degree of leaching (c) associated with forest vegetation (d) colour
19. The forest type which is the most rich in tree species is the (a) tropical (b) Deciduous (c) Coniferous (d) Mediterranean
20. Linseed oil is associated with (a) flax (b) coconut (c) olives (d) rapeseeds
21. Which of the following is not correct with regards to the solar system? (a) The planets all orbit round the sun (b) The sun is only a source of the energy needed on the planets (c) The earth as well as the other planets rotate around the sun (d) all the planets have definite orbits around the sun
22. Fossil fuel reserves are found in the Lake Chad basin because (a) The Basin lies approximately along he axis on which the rich Bakassi oil fields are

found (b) The basin is at the edge of the desert with conditions similar to that of Iraq (d) it is an inland drainage basin with many large rivers emptying into it (d) Its rocks are sedimentary

23. Which of the following is correct? (a) The Canaries current is cold and washes the coast of NE Africa (b) The Peruvian current is warm and washes the West coast of America (c) The Gulf stream is warm and moves north eastward on the Atlantic (d) The middle east current is warm and washes the coast of Saudi Arabia

24. Which of the following formulae is the correct one for converting X° Fahrenheit temperature readings into Centigrade temperature readings (Y°)? (a) Y = (X + 32)5/9°C (b) Y = (X-32)5/9°C (c) Y (X - 32)9/5°C (d) Y = (x + 32)9/5°C

ANSWERS TO GEOGRAPHY 2007
1.No correct option 2.D 3.C 4.C 5.B 6.C 7.C 8.A 9.A 10.C 11.C 12.A 13.D 14.A 15.A 16.B 17.C 18.C 19.A 20.A 21.C 22.D 23.C 24.C

OBAFEMI AWOLOWO UNIVERSITY ILE IFE,
2006 POST-UME SCREENING
GEOGRAPHY

1. The earth rotates though 150 of longitude once in (a) a minute (b) an hour (c) 24 hours (d) a day
2. Aeolian erosion refers to the work of (a) plants (b) wind (c) ice (d) running water
3. The scale of a map is the ratio between the (a) distance over the land and the distance over the water (b) Distance on the map and the distance on the globe (c) vertical and horizontal differences (d) distance on the map and that on the earth's surface
4. Which of the following scales should show the greatest amount of detail on a map? (a) 1: 50.000 (b) 1 : 500,000 (c) 1 : 20,000 (d) 1 : 200,000
5. Which of the following statements is not true for lines of latitude? (a) they form parallel circles (b) they range from 00 to 1800 N and S (c) only one line is also a Great Circle (d) they form parallel circles
6. Large in area and high in population; which of the following countries fits this description? (a) Lesotho (b) Togo (c) Nigeria (d) Zaire
7. One of these is NOT a landform in Africa (a) Scarp (b) Inselberg (c) Drumlin (d) Doline
8. Which of these does not lie in the principal earthquake regions of the world? (a) Japan (b) Kenya (c) Iran (d) Turkey
9. Which of these soil groups is considered the most productive? (a) Chernozems (b) Latosols (c) Podozols (d) Sierozems
10. One example of inland drainage lake in Africa is (a) Lake Chad (b) Lake Victoria (c) Lake Malawi (d) Lake Turkana
11. The African river that crosses the equator twice is (a) Zaire (b) Nile (c) Mississippi (d) Amazon
12. Some rivers in their delta region break into many branches before entering the sea. These divisions are known as: (a) Creeks (b) Distributaries (c) Tributaries (d) Effluents
13. Kariba Dam is found in River. (a) Zambezi (b) Congo (c) Niger (d) Nile
14. The major air mass affecting the climate of West Africa is summer is the (a) harmattan wind (b) tropical continental (c) warm equatorial (d) tropical maritime
15. If a map has a scale of 1 : 50,000 and a cocoa plantation is represented on the map by a rectangle 4cm by 3cm, what is the area of the plantation? (a) 3 sq. km (b) 30 sq.km (c) 12 sq.km (d) 20 sq.km
16. The gap between two ranges within which transportation is usually possible in a mountainous region is called (a) Valley (b) Col (c) ridge (d) Spur
17. What are Greenhouse gases? (a) Gases found around green houses in botanical gardens (b) Gases which are able to trap heat on the earth surface (c) Gases which help global circulation of winds and platit growths (d) Gases which help farmers grow certain crops during the dry seasons.
18. The doldrums refer to (a) land areas bordering the confluence of the blue and white Nile (b) areas of intense weather activities around the Mediterranean (c) areas in South Atlantic where cold and warm currents meet (d) areas within a few degrees north and south of the equator.
19. Nigeria Sati is designed primarily to (a) help GSM providers in achieving a wide national coverage (b) strengthen rapid response by Nigeria's Armed Forces (c) help in the 2006 Census (d) provide information about various regions of the earth
20. The major sedimentary minerals found in Nigeria include: (a) tin, columbite and gold (b) tin, coal and salt (c) limestone, columbite and diamond (d) limestone, petroleum and coal
21. The cloud which are white globular masses, forming ripples in the sky is called (a) Cirrus (b) Cirrocumulus (c) altocumulus (d) altostratus
22. Which of the following routes must have the least gradient? (a) Motorway (b) Rail line (c) Bush path (d) Carnal
23. The foremost producers of petroleum in the Middle East are: (a) Saudi Arabia, Kuwait, Libya and Iran (b) Saudi Arabia, Iraq, Iran and Kuwait (c) Saudi Arabia, Iran, Venezuela and Oman (d) Saudi Arabia, Iraq, Libya and Venezuela

ANSWERS TO GEOGRAPHY 2006
1.B 2.B 3.D 4.C 5.B 6.C 7.C 8.B 9.A 10.A 11.A 12.B 13.A 14.B 15.A 16.B 17.B 18.D 19.D 20.D 21.B 22.B 23.B