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AHMADU BELLO UNIVERSITY, ZARIA

CAMPUS DREAM
POST UTME
PAST QUESTIONS & ANSWERS

FOR

SCIENCES, MEDICINE AND ENGINEERING

2009 - Date

AHMADU BELLO UNIVERSITY, ZARIA
POST UNIVERSITY SCREENING 2017/2018
Time allowed: 1 hour

INSTRUCTIONS

Read the following instructions carefully:

1. Use HB pencil to shade your answers. Ensure that any shading in error is thoroughly erased.
2. Candidates should indicate the question Paper Type given to them in the appropriate space in the Answer Sheet.
3. Write your JAMB registration numbers on the question paper in the space provided at the top of page 1.
4. Attempt all questions.
5. The use of calculator and or similar electronic devices is NOT allowed

ENGLISH

1. An autobiographical novelis: A. A novel written about another novelist B. A true account of a novelist's life by himself C. A novel in which the novelist draws mainly on materials from his own life D. A novel using the 'I' pronoun
2. Plot in prose fiction is best defined as: A. The cause and — effect sequence of events B.. The brief summary of events C. The central event D. The subject — matter of a novel

3. Which of these is not true about unity of action in a novel? A. Action may be unified through a single main character B. Action may be unified by being set in one place C. Action may be unified by many characters D. Action may be unified by having one consistent point of view
4. Action in a novel is best defined as: A. The summary of the novel's story B. What the characters do or say in the novel C. The numerous sub — plots of the novel put together D. The totality of all the episodes in a novel leading to the conclusion
5. Suspense in a novel means. A. the postponement of the hero's death till the last possible moment B. the intense emotions that the author conveys C. the inconclusive end of a novel D. when we are curious about what happens next in a novel
6. A realistic novel is one in which the characters are: A. real B.. historic C.. just of above average intelligence D.. the types that we meet in everyday life
7. Theme is best defined as: A. The subject matter of a novel or play B.. central idea in a play or novel C. The point of view in that novel D. The sum — total of all the characters experiences
8. What figure of speech does the following quotation contain? Life's but a walking shadow (Macbeth) A. A metaphor B.. An image C.. A synecdoche D.. An allusion
9. Which of the following statement is most true about poetry? A. the meaning of words are more important than their sounds B. the sounds of words are more important than their meanings C. the sound of words are often more important than their meanings D. sounds and meanings of words are of little consequence
10. Which of these best define exposition in drama? A. the author's own general introduction to the play B. the author's early exposure of his dramatis personae to conflict C. introduction to the characters and the general problem with which the play deals D. the first performance of the play on stage
11. When the speaker in a poem cannot be identified with the poet, that speaker is called: A. a persona B. a dramatis persona C. a soliloquist D. a ventriloquist
12. Which of these definitions best describes a lyric? A. A short poem B. a short poem in which the poet himself is speaking C. a poem expressing a personal idea, feeling or mood D. a poem divided into stanzas

Read the following extract from a poem to answer questions 13 and 14.

Among rocks, I am the loose one, among arrows, I am the heart among daughters, I am the recluse, among sons, the one who dies young

13. What kind of repetition is used in the extract? A. anaphora B. single word repetition C. line repetition D. phrase repetition
14. Apart from emphasis, what other effect does the repetition have? A. makes the poem rhythmical B. makes the poem tedious C. makes the poem monotonous D. 'makes the poem exhilarating
15. The following line from poem Western wind, when will thou blow? Is an example of: A. rhetorical question B. caesura C. alliteration D. nature imagery

16. Identify the odd one out of these types of imagery   A. visual imagery   B. tactile imagery
    C. synaesthesia   D. literal imagery
17. When a poet uses mainly soft vowel sounds in a poem, the texture of the poem is:
    A. mellifluous   B. harsh   C. assonantal   D. neutral
18. The sounds in the following lines may be described as an example of: The moan of doves in immemorial
    elms, and murmuring of innumerable bees   A. Alliteration   B. Euphony   C. Cacophony   D. A mixture
    of all above
19. The man dies in him who keeps silent in the face of tyranny". This statement can be described as:
    A. Metaphoric   B. Literal   C. Tragic   D. a simile
20. The literary technique in which a reader is taken to the past of a current action is known as:
    A. rewinding   B. fast forward   C. flashback   D. repetition

PHYSICS
21. A piece of rubber 10cm long stretches 6mm when a load of 100N is hung from it. What is
    the area stretched if the young modulus is $50N/m^2$.   A. $60m^2$ B. $150m^2$ C. $33.33m^2$ D.
    $15m^2$
22. To determine the weight of an object you would A. use a balance B. use a spring balance
    C. find the force necessary to give it a certain acceleration   D. use none of these methods
    E. use any of these methods.
23. A gas at pressure PN/m and temperature 27°c is heated to 77°c at constant volume. The
    new pressure is A. 0.85PN/m   B. 0.86PN/m   C. I.I6PN/m   D. I.18PN/m   E.
    2.85PN/m
24. Two lamp rated 40w and 220w, each are connected in series. The total power dissipated
    in both lamp is   A. 10w   B. 20w   C. 40w   D. 80w   E. none
25. A magnet is moved through a coil of wire. The emf produced in the wire depends on
    A. the number of turns in the coil   B. the strength of the magnet   C. the speed at which
    the magnet is moved   D. all of the above   E. none of the above
26. A potential difference of 6v is used to produce a current of 5A for 200s through a heating
    coil. The heat produced is   A. 4800cal   B. 6000cal   C. 2400j   D. 240kcal   E. 600j
27. Two boys are communicating with each other by stretching a string passing through a hole
    punched in the bottom of each of the two tin cans. The physical principle employed is that
    sound travels   A. mainly through air   B. fainter in stretched string C. faster through
    gasses than in solids and liquids   D. with greater ease through a string than in air
    E. none of the above is correct.
28. The hatch door of a submarine has an area of $0.5m^2$. The specific gravity of sea water is
    1.03. Assume that g = $10m/s^2$ and neglect the atmospheric pressure. The force exerted by
    the sea water on the hatch door at a depth of 200m is   A. 1.03×10^5N B. $1.03 \times 10^4Nm^2$
    C. $2.6 \times I0^3Nm^2$ D. $2.06 \times 10^{11}N$ E. 1.03×10^3N.
29. When equal weights of iron and water are subjected loan equal supply of heat, it is found
    that the piece of iron becomes much hotter than water after a short time because
    A. The specific heat or iron is higher than water   B. Iron is in solid form   C. water is in
    liquid form   D. the specific heat of water is higher than that of iron   E. the specific heat of
    iron is infinite.
30. The speed of light in is $3.0 \times 10^8m/s$. its speed in glass having a refractive index of 1.65 is
    A. $1.82 \times I0^8m/s$ B. $3 \times 10^8m/s$ C. $6.0 \times I0^8m/s$ D. $1.82 \times 10^2m/s$

BIOLOGY
31. Which of the following is an excretory organ in flatworms?
    A. Malpighian tubules   B. Kidney   C. Nephridium   D. flame cells
32. Which of the following is not an excretory organ in mammals?
    A. Anus   B. Liver   C. Lung   D. Skin
33. Which of the following is not freshwater?   A. Brackish water   B. Puddle   C. Pond   D. River
34. Which of the following is a special organ for oxygen absorption in aquatic animals?
    A. Air bladder   B. Lung   C. Spiracle   D. Gills
35. Which of the following is not a feature of Marshes?   A. High oxygen content

B. Water-logged soil C. Low light intensity D. Abundant saprophytic bacteria
36. Drought resistant plants are called? A. Hydrophytes   B. Xerophytes
C. Mesophytes D. Bryophytes
37. Primary succession on a terrestrial nabitat is associated with
A. Bare soil   B. Abandoned farmland   C. Primary forest   D. Secondaryforest
38. Which of the following may not result in overcrowding? A. Limited space
B. Scarcity of food   C. Increased birth rate   D. Tight immigration conditions
39. Which is the function of mitochondria? A. Gives cell rigid shape B. Site for energy release
C. Manufactures protein D. Contains cell sap
40. Which is not a feature of animal cells? A. Presence of centrosome
B. Absence of cell wall C. Presence of few, small vacuoles D. Presence of plastids

CHEMISTRY

41. Which of the following in a molar solution would be the product conductor of electricity?
A. ammonia   B. sodium chloride   C. hydrochloric acid D. zinc tetraoxosulphate (Vi)
42.   How many moles of oxygen atoms are presented in 4.0g of the gas. (O=16)
A. 0.25   B. 0.50 C. 1.00 D. 4.00
43. In the periodic table, the entire element within the same group has the same
A. atomic number   B. number of electrons in the nuclei of their atoms
C. number of electron available for bonding   D. number of isotopes
44. How many atoms are there in 0.3mole of an element? {Avogadro's constant
=6.0 x 10^{23})   A. 2.0 x 10^{24} B. 1.8 x10^{24} C. 1.8 x10^{23} D. 3.0 x 10^{22}
45. Milk exposed to air for a few days testes sour due to the presence of
A. ethanoic acid B. Citric acid   C. lactic acid   D. tartaric acid
46. A substance which produces the hydroxonium ion as the only positive ion when dissolved in water
is   A. an acid   B. an acid salt   C. a normal salt   D. a base
47. Petrol can be obtained from fuel oil by A. hydrolysis B. Hydrogenation   C. Dehydration
D. cracking
48. Which of the following is not true of metals? A. they are good conductors of heat and electricity
B. they are ductile and malleable C. their oxides are basic D. they can be used as insulators
49. Which of the following is not a property of chlorine? A. it is greenish yellow and has a choking
smell B. it bleaches litmus paper C. it is a liquid at room temperature and pressure D. it has a
higher density than air
50.   If calcium has atomic number 20 and mass number 40, the constituent of the atom is
A. 20 protons, 10 neutrons and 10 electrons   B. 20 protons, 20 neutrons and 20 electrons   C. 20
protons, 20 neutrons and no electrons   D. 10 protons, 10 neutrons and 20 electrons

SOLUTION TO ABU 2017/2018 POSTUTME EXAM
ENGLISH

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

PHYSICS

21. e = 6mm = 0.6cm, I = 10cm, F = 100N,
young modulus = 50N/cm^3, Area = ?
From   young modulus = $\frac{F/_A}{e/_I}$

50 = $\frac{100 \times 10}{0.6A}$

∴ A = $\frac{100 \times 10}{50 \times 0.6}$ = 33.33cm^2 **Ans**: C   22. B

23. At constant volume, $\frac{P_1}{T_1} = \frac{P_2}{T_2}$

$P_2 = \frac{P_1 T_2}{} = \frac{P \times 350}{}$ = 1.16PN/m   **Ans**: C

$$\frac{T_1}{300}$$

24. E   25. A

26. Heat = Ivt = 5 x 6 x 200 = 6000cal   **Ans**: B   27. D

28. Pressure = I x depth = 1.03 x 200 = 206N/m^3

     Force = pressure x Area = 206 x 0.5 = 1.03 x 10^{3}N   **Ans**: E   29. A

30. Refractive index = $\dfrac{\text{speed in air}}{\text{speed in glass}}$

     speed in glass = $\dfrac{3 \times 10^8}{1.65}$ = 1.82 x 10^{8}m/s   **Ans**: A

BIOLOGY

31. D   32. A   33. D   34. B   35. A   36.   37. ***

38. D   39. B   40.

CHEMISTRY

41. D   42. A   43. C   44. C   45. A   46. A   47. D

48. D   49. C   50. B

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ENGLISH
COMPREHENSION PASSAGE

Tony spends most of Ins spare time at his medium-sized farm located on the fringes of the capital City along Okigwe road, the farm haven for the lover of retreat It occupies an undulating land, which stretches for a good distance The farm enjoys a modest canopy formed by palm trees, banana branches and coconut [ices The barbed wired fence bends harmoniously with the surrounding lush of the green foliage. There on the heart of the farm, Tony raises small animals that include rabbits, goats and pigs He ensures that animals particularly the pigs that form the main Naira earners are always in peak condition This Tony does by seeing to it that they receive then regular clinical attention Similarly, they always insist that the pens are cleaned and sanitized. Not surprisingly, the droppings from the animals are constantly carted away by enthusiastic farmers They believe that the application should significantly boost their own harvest This in part explains why there has been a good hassle for the droppings from Tony's farm In some other ways, the patronage is emblematic Some of the fanners simply learn through their inner thought to make a statement

Whenever Tony is out of his station, the manager follows religiously the strictly gamin already established

1. The second sentence suggests that Tony's farm is good (a) for religious camping and meditation (b) for escaping from city noise (c) as a rendezvous for layers (d) as a location for serious meeting
2. From the description of the farm and surrounding,
3. "They received their regular clinical attention" This means that
   (a) die animals are taken to the clinic regularly (b) the animals are under constraint observation (c) the animals are given regular vaccination (d) the animals have a doctor at the clinic
4. The farmers who use animal droppings from Tony's farm think that (a) their harvest will increase (b) their crops will remain healthy (c) their farm will be inexpensive (d) their farm will be a model
5. Tony's farm manager can be described as......... (a) a good imitator (b) a religious person (c) a sympathetic individual (d) a responsible worker

In question 6 and 7, an idiom is underlined in each of the sentences, find under each sentence the group of words that gave the nearest meaning to the idiom
6. He killed the goose that laid the golden egg when he decided to spend his capital on buying a car (a) sacrificed future profit to satisfy present needs (b) was bad natured (c) became a poor person (d) became an important person.
7. I laughed up my sleeve as he told the tales of his exploits. (a) was very pleased (b) was openly making him of him (c) was secretly amused (d) laughed myself helplessly

In questions 8 and 9, choose the word or set of words that best lit the meaning of the sentence as a whole.
8. .... the long run, we will make enough profit

(a) In   (b) On   (c) At   (d) For
9.   The congregation all sorts and conditions of men (a) composes   (b) consists (c) comprises
       (d) conjectures.

In questions 10 and 11, select the option that is nearest in meaning to the underlined word
10.   The effect of the new policy on the masses is rather <u>negligible</u>. (a) unimportant
       (b) useful   (c) insignificant (d) negligent
11.   When I returned to the cyber cafe a week later, my ticket had become <u>invalid</u>.
       (a) inappropriate   (b) crippled   (c) discounted   (d) out of date.

In question 12 and 13, choose from the options given in A — D the one which is opposite in meaning to the word
12.   An expert will not be found waiting in this type of job hut will
       (a) A foreigner   (b) a jobber   (c) An applicant   (d) A novice.
13.   If you are not for lesbianism, it means you are for   (a) celibacy   (b) homosexuality
       (c) nun hood   (d) heterosexuality
14 .   The chairman's verdict redressed the injustice meted out by the secretary
       (a) corrected   (b) aggravated   (c) restored   (d) addressed.
15.   My friend gambled about all day yesterday This means that he   (a) was gambling with his
       money yesterday (b) did nothing useful yesterday (c) played cards for money (d) was
       jumping in the field.

From the words or group of words lattered A-D, choose the option that is most nearly opposite to the underlined words
16.   Our grandmother was very much loved for her <u>altruism</u>.
        A. benevolence   B. selflessness   C. kindness   D. selfishness
17.   The principal <u>lost</u> his usual good humour when his school was defeated in this year's
       cowbell mathematics quiz competition. A. provoked   B. kept   C. maintained   D.
       obtained
18.   Nkoli was the one who politely <u>declined</u> the invitation.
       A. turned off   B. turned away   C. accepted   D. received
19.   We quickly realized that a confrontation was <u>inevitable</u>.
       A. disastrous   B. unavoidable   C. desirable   D. conditionally
20.   Obiora's name was <u>inadvertently</u> omitted. A. unfortunately   B. improperly
       C. intentionally   D. conditionally

CHEMISTRY
21.   In the reaction between sodium hydroxide and sulphuric acid solutions, what volume of
       0.5molar sodium hydroxide would exactly neutralize $10cm^3$ of 1.25molar sulphuric acid?
       A. $5cm^3$ B. $10cm^3$ C. $20cm^3$ D. $25cm^3$ E. $50cm^3$
22.   A small quantity of solid ammonium chloride (NH_4Cl) was heated gently in a test tube. The
       solid gradually disappear to produce a mixture of two gases later a white cloudy deposit
       was observed on the cooler part of the test tube. The ammonium chloride is said to have
       undergone   A. distillation   B. sublimation   C. precipitation   D. evaporation
         E. decomposition
23.   Elements P, Q, R, S have 6, 11, 15, & 17 electrons respectively. Therefore   A. P will form
       an electrovalent bond with R   B. Q will form a covalent bond with S   C. R will form an
       electrovalent bond with S   D. Q will form an electrovalent bond with S   E. Q will form a
       covalent bond with R
24.   An element X forms the following compounds with chlorine: NCl_4, XCl_3, XCl_2. this
       illustrates the

A. law of multiple proportions   B. law of chemical proportions   C. law of simple proportion   D. law of conservation of mass   E. law of definite proportion.

25. The oxidation state of chlorine in potassium chlorate is A. 11   B. 12   C. 13   D. 15   E. 17

26. When carbon dioxide is bubbled into limewater, a white precipitate is formed. If the passage of the gas is continued , the precipitate disappears. The reasons for this is A. calcium carbonate is formed which on reaction dissolves   B. calcium hydrogen carbonate is precipitated and then dissolves   C. calcium carbonate is formed which on reaction with further carbon dioxide forms soluble calcium hydrogen carbonate   D. concentration of solution has occurred with the deposition of calcium hydroxide   E. the solution has become saturated and solid carbon dioxide has been deposited.

27. The following reactions are stages in important industrial processes:
(i) $N_{2(g)} + O_2 \rightarrow 2NH_{3(g)}$ ΔH is negative (ii) $2SO_{2(g)} + O_{2(g)} \rightarrow 2SO_{3(g)}$ ΔH is negative
(iii) $N_{2(g)} + O_{3(g)} \rightarrow 2NO_{(g)}$ ΔH is positive. Which of the above forward reactions is favoured by (i) a decrease in the concentration of the pressure and (ii) an increase in temperature?
A. i   B. ii   C. iii   D. i & ii   E. i & iii

28. Methanoic acid mixes with water in all proportions and has about the same boiling point as water. Which of the following methods would you adopt to obtain pure water from a mixture of sand, water and methanoic acid   A. fractional distillation   B. filtration followed by aestivation   C. neutralities with sodium hydroxide followed by distillation.
D. neutralization with sodium hydroxide foilowed by filtration
E. etherification with ethanol followed by distillation.

29. Which of the following statements applies during the electrolysis of sodium hydroxide solution using platinum electrodes? A. anions are discharge at the cathode   B. hydrogen ions are discharge at the anode   C. the concentration of sodium hydroxide decreases at both electrode compartments   D. the concentration of sodium hydroxide increases at the cathode only   E. the concentration of sodium hydroxide increases at the anode only.

30. Which of the following statement is true? When the potassium atom forms its ion   A. it gains one electron and becomes neutral   B. its atomic number decreases   C. it achieves electronic configuration of argon   D. it loses one proton   E. it 1oses one neutron.

PHYSICS

31. The slope of a straight line displacement time graph indicates   A. distance traveled   B. uniform velocity   C. uniform acceleration   D. instant acceleration   E. uniform speed.

32. A ball of mass 0.5kg moving at 10m/s collides with another ball of equal mass at rest. If the two balls move off together after the impart, calculate their common velocity   A. 0.2m/s   B. 0.5m/s   C. l0m/s   D. 3m/

33. How much heat is given out when a piece of iron mass 50g and specific heat capacity $460Jkg^{-1}k^{-1}$ cools from 85°c to 25°c?   A. 1.38×10^6J B. 2.53×10^2J C. 1.98×10^4J D. 1.38×10^3J E. 1.27×10^3J

34. Which of the following is not a suitable method of reducing loss of heat from a piece of hot iron?   A. wrapping it in cotton wool   B. painting it black   C. placing it in a vacuum   D. placing it in a rubber support   E. keeping it in a closed wooden box

35. A bat emits a sound wave at a speed of 1650.00m/s and receives the echoe 0.15s later. Calculate the distance of the bat from the reflector   A. 8.75m   B. 16.60m   C. 87.75m   D. 123.75m   E. 330.00m

36. Which of the following is/are characteristics of sound? i. pitch ii. Loudness iii. Quality iv. Noise   A. I only   B. ii only   C. I & ii only   D. 1, ii & iii only   E. I, ii, iii and iv

37. An image which can be formed on a screen is said to be A. virtual   B. blurred   C. inverted   D. erect   E. real

38. A ray of light is incident at an angle of 30° on a glass prism of refractive index 1.5. Calculate the angle through which the ray is minimally deviated in the prism.(the medium surrounding the prism is air).   A. 10.5°   B. 5.5°   C. 21.1°   D. 38.9°   E. 40.5°.

39. At which of the following distances from the lens should a slide be placed in a slide projector if the focal length of the projection lens? A. less than f   B. greater than 2f   C. greater than f but less than 2f   D. equal to f   E. equal to 2f
40. What of the camera corresponds to the iris of the eye? A. shutter   B. film   C. lens   D. diaphragm   E. focusing ring

BIOLOGY

41. The nucleus is considered the control organelle of a cell because it A. Contains the genetic material B. Contains the nuclear sap C. is bounded by the nuclear membrane D. is located at the centre of the cell.
42. Regulation of blood sugar level takes place in the   A. pancreas   B. Ileum   C. Liver   D. Kidney
43. The heart of the adult frog consists of A. two auricles and two ventricles   B. one auricle and one ventricle C. two ventricle and two auricles D. one ventricle and two auricles
44. A group of organisms of different species living in a particular area is described as a A. colony   B. community   C. population   D. niche
45. A freshwater plant such as water lily can solve the problem of buoyancy by the possession of   A. arenchymarous tissue   B. dissected leaves   C. thin cell walls of the epidermis   D. water repeling epidermis
46. Soil micro-organisms are beneficial because of their involvement in A. photosynthesis B. translocation C. cycling of nutrients D. respiration using soil air
47. One of the ways in which body cells differ from gamete cells is in the A. type of centromeres they contain   B. number of chromosomes pair they contain   C. type of chromatids they contain   D. number of chromosomes they contain
48. In the blood transfusion, agglutination occurs when   A. white blood cells from two individuals meet B. two different antibodies meet C. two different antigens meet   D. contrasting antigens and antibodies meet.
49. The richest sources of vitamin A are A. palm oil and groundnut oil   B. palm oil and carrots   C rice and groundnut oil D. oranges and carrots
50. Yellowing of leaves is a symptom associated with deficiency of A. iron, calcium and magnesium   B. nitrogen, sulphur and potassium   C. sulphur, phosphorous and iron   D. magnesium, nitrogen and iron

SOLUTION TO ABU 2015/2016 POSTUTME

USE OF ENGLISH

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

CHEMISTRY

21. This is a molarity problem: $C_A = 1.25M$, $C_B = 0.5M$, $V_A = 10cm^3$, $V_B = ?$
 Equation of reaction: $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$; $n = ½$
 Using the formular: $\frac{C_AV_A}{C_BV_B} = n$; $\frac{1.25 \times 10}{0.5 \times V_B} = \frac{1}{2}$ 22. B, sublimation
   $V_B = \frac{12.5 \times 2}{0.5} = 50cm^3$

23. D, P has configuration 2, 4 (methalloid)
       Q has configuration 2, 8, 1 (metal)
       R has configuration 2, 8, 5 (non metal)
       S has configuration 2, 8, 7 (non metal)
   ∴ Q (metal) combining with a non metal S will form an electrovalent bond.
24. A, law of multiple proportions
25. potassium chlorate   → $KCIO_3$
    $1 + Cl + (-2 \times 3) = 0$; $Cl = 6 - 1 = 5$
 The oxidation state of chlorine is +5 remaining 3 electrons to make it octet. Thus our answer is C

26. When CO_2 is bubled into lime water $Ca(OH)_2$, it forms a precipitate of $CaCO_3$ which is insoluble in water. On further bubling of CO_2, calcium hydrogen carbonate $CaHCO_3$ (which is soluble) is then formed. **Ans**: C

27. In (i)
   * pressure has no effect since the number of molecules of both side are equal
   * increasing the temperature favours the backward reaction since ΔH is negative

In (ii)
   * decreasing the pressure favours the backward reaction according to Lechateliers principle
   * increasing the temperature favours the backward reaction since ΔH is negative

In (iii)
   * pressure has no effect
   * increasing the temperature favours the forward reaction since ΔH is positive   **Ans**: C

28. The water and methanoic acid is separated from the sand by filtration. The mixture of water and methanoic acid can then be separated by distillation.   **Ans**: B

29. In the electrolysis of NaOH using platimum electron, hydrogen ions are discharged at the anode. **Ans**: B

30. The electronic configuration of K is 2, 8, 8, 1. When it forms an ion (i.e. K^+) it losses one electron. The configuration now becomes 2, 8, 8 which is the same as that of argon. **Ans**: C

PHYSICS

31. C

32. $m_1 = 0.5kg$, $v_1 = 10m/s$, $m_2 = 0.5kg$, $v = ?$
$$m_1v_1 + m_2v_2 = (m_1 + m_2)v$$
At rest $v_2 = 0$
$0.5 \times 10 + 0 = 1v$ ∴ $v = 5m/s$ Ans: C

33. $H = mcΔθ = 0.05 \times 460 \times (85 - 25) = 1.38 \times 10^3 J$ Ans: D   34. A

35. $v = \frac{2λ}{t}$ where λ = wavelength
$$1650 = \frac{2λ}{0.15}$$
$λ = \frac{1650 \times 0.15}{2} = 123.75m$ Ans: D

36. D   37. E   38. B   39. C   40. D

BIOLOGY

41. A   42. A   43. D   44. B   45. A   46. C   47. B

48. D   49. B   50. B

AHMADU BELLO UNIVERSITY, ZARIA
POST UNIVERSITY SCREENING 2014/2015
Time allowed: 1 hour

ENGLISH

Choose the correct option to fill the blank spaces

1. The guest ___ breakfast by the time the bus arrives a. shall have finished b. have finished c. had finished d. are finishing
2. You can go on I ___ what you are saying a. will understand b. an understanding c. understanding d. waste understanding
3. When he was knocked on the head, he fell ___ to the ground a. fainted b. Unconscious c. collapsed d. noisily
4. It .... so hard that all the cares have stopped moving a. will rain b. rained c. rain d. rains
5. The principal will be going away on leave, in his absence the vice-principal will ___ the school a. overlook   b. take over   c. look after   d. care for

Choose the word that is nearly opposite in meaning to the underlined word.

6. The able-bodies should take care of the ___ a. feeble   b. weak-minded   c. Suffering   d. softhearted
7. The chairman ordered him either to withdrew or to ___ his allegations a. affirm b. drew c. express d. complete
8. He shows plenty of goodwill to his neighbors, but they bear nothing except ___ towards him   a. bad luck   b. malice   c. anger   d. unhappiness
9. I supported what you said but I___ the way you said it a. argued about   b. objected to c. interfered with   d. investigated
10. Though many of us were poor quite a few were ___ a. arrogant   b. Prodigal   c. Affluent d. Luxurious

MATHEMATICS

1. A fair coin is tossed ten times. What is the probability of getting at least two heads? A. 513/1024   b. 615/1024   c. 968/1024   d 1011/1024
2. A man bought 220 mangoes at N5x. he sold each for 3x kobo and made a gain of N8. find the value of x   a. 2   b. 5   c. 10   d. 6
3. Calculate the sum of infinity of $1 + \frac{1}{3} \pm \frac{1}{9} + \frac{1}{27}$ a. 0.33   b. 0.67   c. 1.5   d. 2.5
4. If "P + "C2, then n can be a. 1   b. 2   c. $\frac{3}{2}$ d. 3
5. Express $\tan 22\frac{1}{2}^0$ in the surd form a. + √2 - 2   b. I - √2   c. √2 - I   d. +√2 + I
6. If sin (x - a) = Cos(x + a), then tan is a. 0.8   b. 0.75   c. 1.0   d. 6.28
7. Simplify 11011_3 a. 10100_3 b. 1100_2 c. 1110_3 d. 1011_2
8. A binary operation x is defined on R, the set read numbers by xy =√XY =√XY, for all X,Y ER. If X*(2*8) =6, find x   a. 2   b. 4   c. 9   d.10
9. Find the mean deviation of 5,8,7 and 2,   a. 0   b. 2   c. 5   d. 10
10. The volume of two similar solid cubes are $729cm^3$ and $512cm^2$. Find the ratio of their lengths   a. 4:3   c. 3: 2   b. 9:7   d. 9:8

PHYSICS

1. Which of the following is not true about semi conductor? a. moving holes are equivalent to moving positive charges   b. there are two kind of charges carrier; free electron and hole c. the escape of a valence electron from an atom produces electron holes pair of charge carrier   D. Increase in temperature increases its electrical resistance
2. The minimum energy necessary to remove an electron from a given atom at infinity is called……. a. excitation   b. ground state energy c. ionizing energy   d. binding energy

3. Find the de Broglie wavelength of a 0.01kg pallet having a velocity of 10m/s and energy - 663×10^{34}js. A. 6.63×10^{31}m b. 6.63×10^{-32}m c. 6.63×10^{-33}m
4. A set-up transformer is designed to operate from a 25v supply. If the transformer is 80% efficient, determine the current in the primary coil when the output terminals are not connected to 240v 100w lamp. A 5.0A   b 4.0A   c. 2.5A   d. 2.0A
5. AN object of mass 0.2kg and density 600kgm^3 is suspended with a string so that it is immersed in paraffin of density 900kgm^{-3}. Find the tension in the string
   a. 0.2N   b. 2.0N   c. 1.0N   d.0.1
6. A rocket burns fuel at the rate of 20kgs^{-1} and eject it with a velocity of 5.0×10^{3}m/s^{-1}. Calculate the thrust exerted b gas on the rocket. A. 1.0×10^{5}ms^{-1} b. 2.0×10^{5}ms^{-1}. c. 3.0×10^{5}ms^{-1} d. 5.0×10^{5}ms^{-1}
7. Which of the following pairs consist fundamental quantities only? a. velocity and gravitational potential   b. acceleration and field strength   c. momentum and work done   d. moment and mass.
8. One of the limitation of Thomson's model of the atom is that it does not explain.
   a Small angle   b. stability of the atom   c. ionization process   d. the variation of the effective atomic radius
9. A wire carrying a current of IGA and 2.5m length is placed in a field of flux density 0.14T. what is the force of the wire if it is placed at 600 to field?
   a. 30.3N   b. 20.5N   c. 15.3N   d. 10.5M
10. In the transformer, the magnetism of the core is repeatedly reverse by the magnetic field resulting in energy as heat. The loss is called. a. Eddy current   b. hysteresis loss c. flux linkage   d. joule heating loss

BIOLOGY
1. In bird, the following feathers posses after shaft   a. Quill and filoplurnes   b. Down and filoplurnes   c. Covert and down   d. Quill and covert
2. The nutritive layer of the eye in mammals is   a. refracting media   b. conjunctiva   c. Cornea   d. Sciara
3. Ultra filtration in the Kidney takes place in the   a. Bowman's Capsule   b. Pelvis   c. Loop of Henle   d. Proximal Convulated Tubule
4. Which of the following bones is not a component of the fore limb? A. Olearanon   b. Ulna   c. Tibia   d. Humerus
5. The condition in which the anthers mature before the stigma is called
   a. protandry   b. Epigyny   c. Hypogyny   d. protogyny
6. In most true ferns, sporangia are grouped into   a. indusium   b. fronds   c. son   d. Prothalis
7. The ratio of carriers to sucklers in the F_2 generation derived from a parental cross at two carriers of heamoglobins S gene is   a. 3:1   b. 1:3   c. 2:1   d. 1:2
8. In which part of a leguminous plant can bacteria like Azotobacteria be found? A. Spongy mesophyll   b. Root nodes   c. stern internodes   d. Stem nodes
9. In a dicotyledonous stem, companion cells are found close to the   a. Endodermal cells   b. Silver tubes   c. Xylem vessels   d. Pericylic fibres
10. The position occupied by an organism in a food chain is referred to as   a. Trophic level   b. Niche Level   c. Energy level   d. feed level

CHEMISTRY
1. Natural water include the following except   a. Rain water   b. Spring water   c. pure water   d. Lake water
2. Which of the following methods cannot be used to remove permanent hardness from water? a. Adding of washing soda   b. addition of caustic soda   c. perutit method   d. adding alum to water

3. If the solubility or sodium tetraoxosulphate (IV) at 30^0c is 18g per 100g. How much is this gram per kilogram? A. 18g per 100g b. 180g per 100g c. 180g per 1000g d. 180g per mg
4. The following are example of colloid except a. Milk b. starch in water c. aerosol d. ammonium chloride solution
5. The pH of the solution M, N,O, and P are 4,6,8 and 10 respectively. Therefore
   a. non of the solution is acidic b. the pH of the 0 made neutral by adding water
   c. the most acidic solution is P. d. M is the most acidic solution.
6. Sodium chloride may be obtain from brine by a. detection b. distillation c. Evaporation d. sublimation.
7. Oil spillage in pond and creek can be cleared by a. Burning of the oil layer
   b. spraying with detergent c. spraying with common salt d. spraying with oil
8. Which of the following is a chemical compound? a. Soap b. milk c. urine d. gold
9. Crystallization is a separation method used a. where purity of the product is important
   b. Where beauty of the product is important c. where the product is a solid
   d. Where the product cannot be destroy by heat.
10. Which hydroxide dissolves in water to form an alkaline a. Aluminum hydroxide
    b. Calcium hydroxide c. Copper hydroxide d. Iron hydroxide

SOLUTION TO ABU POST UTME 2014/2015

ENGLISH

1. A	2. A	3. B	4. B	5. C	6. A	7. A
8. B	9. B	10. C				

MATHEMATICS

1. A	2. B	3. C	4. **	5. C	6. B	7. 8.
9. A	10. D					

PHYSICS

1. D	2. C	3. D	4. A	5. C	6. A	7. D
8. B	9. A	10. B				

BIOLOGY

1. C	2. C	3. A	4. C	5. A	6. B	7. C
8. B	9. B	10. A				

CHEMISTRY

1. C	2. A	3. D	4. D	5. A	6. C	7. A
8. A	9. A	10. ***				

AHMADU BELLO UNIVERSITY, ZARIA
POST UNIVERSITY SCREENING 2013/2014
Time allowed: 1 hour

Answer all questions: shade the answer sheet as appropriate with HB pencil only,

CHEMISTRY

1. A mixture contains $20cm^3$ of hydrogen, $35cm^3$ of oxygen, $15cm^3$ of carbon dioxide and $10cm^3$ of nitrogen at S.T.P which of the following gives the mole fraction of hydrogen in this mixture?
    A. 0.02   B. 0.16   C. 0.20   D. 0.25   E. 20

2. 0.07g of a hydride of carbon occupies 56 at S.T.P when vapourised and contains 14.29% by mass of hydrogen. The formula of the hydrocarbon is
    A. CH_4 B. C_2H_2 C. C_2H_4 D. C_2H_6 E. C_3H_8 [C = 12, H = 1]

3. The pressure on $100cm^3$ of oxygen gas at 35^0c is 750mm of Hg. What would be the volume of the gas if the pressure is increased to 1000mm of Hg without changing the temperature?
    A. $133.3cm^3$ B. $85cm^3$ C. $75cm^3$ D. $65cm^3$ E. $58cm^3$

4. Which of the following bonds exist in crystalline ammonium chloride (NH4Cl)? A. ionic and covalent   B. ionic and co-ordinate   C. ionic, covalent and co-ordinate   D. covalent, co-ordinate and metallic   E. ionic, covalent and metallic

5. Which of the following is a neutralization reaction? Addition of   A. nitric acid to hydrochloric acid   B. nitric acid to sulphuric acid   C. acid to distilled water   D. nitric acid to sodium hydroxide   E. sodium chloride to distilled water

6. In the preparation of carbon monoxide by heating ethanedoic acid with concentrated sulphuric acid, the concentrated sulphuric acid acts as   A. oxidizing agent   B. reducing agent   C. dehydrating agent   D. reaction medium   E. catalyst

7. How many grammes of methyl acetylene (propane) $CH_3-C=CH$ will completely discharge the colour of 8g of bromine? (Br = 80, C = 12, H = 1)   A. 0.5   B. 1.0   C. 2.0   D. 3.0   E. 4.0

8. Brass is an alloy containing copper and   A. zinc   B. tin   C. aluminum   D. silver   E. lead

9. $60cm^3$ of hydrogen are sparked with $20cm^3$ of oxygen at 100^0c and 1 atmosphere. The total volume of the residual gases is   A. $60cm^3$ B. $10cm^3$ C. $40cm^3$ D. $30cm^3$ E. $70cm^3$

10. If the rate of diffusion of oxygen gas is taken as 1, what will be the rate of diffusion of methane whose relative molar mass is 16?   A. 2.0   B. 1.8   C. 1.4   D. 1.0   E. 0.5

USE OF ENGLISH

In each of questions 11 to 20, choose the word(s) or phrase(s) which best fill(s) the gap(s)

11. The sea wave continue to ……… the cliff on the west coast constantly
    A. impair   B. rub   C. knock   D. erode

12. The college bus was traveling at a high ……… when the accident occurred
    A. velocity   B. acceleration   C. rapidity   D. speed

13. Note that only senior members of staff have the ……… of using the toilet upstairs.
    A. permission   B. occasion   C. privilege   D. habit

14. The chief priest will …….. the main into the cut today.   A. indoctrinate   B. usher   C. convert   D. initiate

15. Obi is noted for his ……… attitude to his seniors at school.   A. receptive   B. Respectful   C. respective   D. respectable

16. The girl that my brother introduced to us last week is pretty ……… ill-mannered
    A. and   B. but also   C. as well as   D. respectable

17. The police report was …… to that of the eye witness. A. contrary B. inconsistent C. different   D. congruent

18. The African extended family system gives security to ……… members.
    A. his   B. her   C. its   D. their

19. I know I …….. read more but I am tired   A. may   B. ought to   C. would   D. could

20. Insects can become ……… to insecticides   A. immunized   B. resistant   C. Reticent   D. immobilized

PHYSICS

21. Which of the following is a scalar quantity? A. momentum   B. acceleration   C. displacement   D. distance   E. force

22. What change in velocity would produce a body of mass 4kg if a constant force of 16N acts on it for 2s? A. 0.5m/s   B. 2.0m/s   C. 8.0m/s   D. 32.0m/s   E. 128.0m/s
23. A body accelerates uniformly from rest at the rate of $3m/s^2$ for 8s. Calculate the distance covered by the body during the acceleration.   A. 12m   B. 24m   C. 48m   D. 72m   E. 96m
24. Which of the following has the same unit as the moment of a force?   A. force   B. power   C. Work   D. momentum   E. charge
25. Which of the following will reduce the frequency of oscillation of a simple pendulum? A. increasing the mass of the bob   B. decreasing the mass of the bob   C. increasing the length of the string   D. decreasing the length of the string   E. increasing the amplitude of oscillation
26. A barometer can be used in determining the length of a i. mountain   ii. Depth of a mine   iii. Dew point. Which of the following is/are correct?   A. I, ii, iii   B. ii and iii only   C. I and iii only   D. I and ii only   E. iii only
27. Which of the following colours of surfaces will radiate heat energy best?
    A. red   B. white   C. black   D. yellow   E. blue
28. A gas which obeys Charles law exactly has a volume of $283cm^3$ at 10^0c. What is its volume at 300c?   A. $142cm^3$ B. $293cm^3$ C. $303cm^3$ D. $566cm^3$ E. $849cm^3$
29. A real image of an object formed by a converging lens of focal length 15cm is 3times the size of the object. What is the distance of the object from the lens?
    A. 30cm   B. 25cm   C. 20cm   D. 15cm   E. 10cm
30. How far from a cliff should a boy stand to hear the echo of his clap 0.9s later? (speed of sound in air = 330m/s)   A. 36.67m   B. 74.25m   C. 148.50m   D. 297.00m   E. 366.67m

MATHEMATICS
31. Find n if 34_n = 100112   A. 5   B. 6   C. 7   D. 8
32. The radius of a circle is given as 5cm subject to an error of 0.1cm. What is the percentage error in the area of the circle? A. $^1/_{25}$ B. ¼   C. 4   D. 25
33. What is the value of x satisfying the equation $4^{2x}/4^{3x}$ = 2   A. -2   B. -1/2   C. ½   D. 2
34. If x = 3 - √3, find $x^2 + ^{36}/x^2$ A. 9   B. 18   C. 24   D. 27
35. Solve the equation y^2 - 11y + 24 = 0   A. 8, 3   B. 64, 9   C. 6, 4   D. 9, -8
36. A man invested a sum of N280.00 partly at 5% and partly at 4%. If the total interest is N12.80 per annum, find the amount invested at 5%. A. N14.00   B. N120.00   C. N140.00   D. N160.00
37. Ice forms on a refrigerator ice box at the rate of 4.06g per minute after 1 minute. If initially there were 2g of ice, find the mass of ice formed in 5 minutes   A. 19.5   B. 17.0   C. 14.5   D. 12.5
38. Obtain a maximum value of the function f(x) = x^3 - 12x + 11   A. -5   B. -2   C. 2   D. 27
39. Two perfect dice were thrown together. Determine the probability of obtaining a total score of 8. A. $^1/_{12}$ B. $^5/_{36}$ C. $^1/_6$ D. $^7/_{36}$
40. The probability of an event P is ¾ while that of another event Q is $^1/_6$. If the probability of both P and Q is $^1/_{12}$, what is the probability of either P or Q? A. $^1/_{96}$ B. $^1/_8$ C. $^5/_6$ D. $^{11}/_{12}$

BIOLOGY
41. Which of the following organelles is used for locomotion in paramecium?
    A. pseudopodium   B. irichocyst   C. cilium   D. pellicle   E. contractile vacuole
42. Which of the following is not true of the nucleus of a living cell? It contains   A. Chromosomes   B. nucleus   C. nucleoplasm   D. chromatids   E. ribosomes
43. The cell membranes consists of   A. carbohydrates and lipids   B. vitamins and proteins   C. lipids and proteins   D. water and sugar   E. starch and cellulose
44. Which of the following is not likely to be found in the cell of a ripe tomato fruit?
    A. plastids   B. chlorophyll   C. cellulose cell wall   D. mitochondrion   E. mineral salts
45. Osmosis can be defined as diffusion of   A. atoms and molecules through a membrane to an area of higher concentration   B. water molecules for a dilute solution to a concentrated solution across a permeable membrane   C. water molecules from area of high concentration to an area of low concentration   D. water molecules from a dilute solution to a concentrated solution through a semi-permeable membrane   E. perspiration and excretion
46. The movement of diaphragm is a characteristic of gaseous exchange in   A. insect   B. Fish   C. toad   D. mammal   E. plants
47. In cellular respiration, energy is stored in the form of   A. adenosine di phosphate (ADP)   B. adenosine mono phosphate (AMP)   C. adenosine tri phosphate (ATP)   D. heat energy   E. electrical energy

48. The medium in which dissolved nutrient are transported in the body of vertebrates is called
   A. latex   B. urine   C. cell sap   D. blood   E. haemoglobin
49. Which of the following structures of the leaf contains air? A. guard cell   B. palisade layer
   C. intercellular space   D. vascular bundle   E. upper epidermis
50. Which of the following organs is specially adapted for gaseous exchange in aquatic organisms?
   A. lungs   B. trachea   C. gills   D. tracheoles   E. Alveoli

SOLUTION TO ABU POST UTME 2013/2014 EXAM

CHEMISTRY
1. total volume of mixture = 20 + 35 + 15 + 10 = 80cm^3
   mole fraction of H = $^{20}/_{80}$ = 0.25   Ans: D
2. no correct option
3. from boyle's law, $P_1V_1 = P_2V_2$ where $V_1 = 100cm^3$, $P_1 = 750mmHg$, $P_2 = 1000mmHg$
   $V_2 = \dfrac{P_1V_1}{P_2} = \dfrac{750 \times 100}{1000} = 75cm^3$ Ans: C
4. C   5. D   6. C   7. C   8. A   9. E   10. D

USE OF ENGLISH
11. D   12. D   13. A   14. D   15. D   16. B   17. A   18. C   19. B   20. B

PHYSICS
21. C   22. C   23. E   24. C   25. C   26. E   27. C
28. From Charles law, $V_1/T_1 = V_2/T_2$ where $V_1=283cm^3$, $T_1=10^0c + 273 =283k$, $T_2=30^0c + 273 = 303k$
   $V_2 = \dfrac{V_1 \times T_2}{T_1} = \dfrac{202 \times 303}{283} = 303cm^3$ Ans: C   29. C   30. C

MATHEMATICS
31. A   32. A   33. B   34. C   35. A   36. D   37. D   38. D   39. B   40. C

BIOLOGY
41. C   42. D   43. C   44. B   45. D   46. D   47. C   48. D   49. C   50. C

1. Dimension of absolute viscosity is   A. $ML^{-1}T^{-1}$ B. MLT^{-1} C. $ML^{-1}T$ D. MLT
2. Turbulent flow generally occurs for cases involving A. highly viscous fluid   B. very narrow passages   C. very slow motion   D. none of these
3. Forces acting on a particle setting in fluid are .... forces? A. gravitational and buoyant   B. centrifugal and buoyant   C. gravitational or centrifugal buoyant drag   D. external, drag and viscous
4. Which of the following equations applies at terminal viscosity? A. mg – V – U = 1   B. mg – V – U = 0   C. V + mg – U = ma   D. U – ma + mg = 0
5. Which of the following is not a high viscous fluid? A. kerosene   B. glue   C. grease   D. glycerin
6. Mercury is an ideal barometric fluid mainly due to it's   A. high density   B. low compressibility   C. low capillary action   D. very low vapour pressure
7. Dimension of surface tension is   A. FL^{-1} B. $F^{-1}L$ C. FL^{-2} D. $F^{-2}L$
8. Which of the following has the smallest least effect on the solubility of a solute into the solvent? A. nature of the solute   B. nature of the solvent   C. temperature   D. pressure
9. Which of the following is insensitive to changes in pressure? A. Heat of vapourization   B. melting point   C. heat of fusion   D. both B and C
10. Vapour pressure of water at 100^0C is about .... bar? A. 0.1013   B. 1.013   C. 10.13   D. 101.3
11. If w is the mode and z is the median of the following set of numbers: 2.4, 2.1, 1.6, 2.6, 2.6, 3.7, 2.1 and 2.8. then (3w, 2z) is A. (2.6, 2.5)   B. (2.1, 2.5)   C. (7.8, 5.0)   D. (5.2, 5.0)
12. A trapezium has two parallel sides of length 6cm and 8cm. if the area is 42cm, find the distance between the parallel sides. A. 6cm   B. 7cm   C. 8cm   D. 5cm
13. An arc of a cycle of length 22cm subtends an angle of $3y^0$ at the centre of the circle. Find the value of y, if the radius of the circle is 7cm.
    A. 30^0 B. 60^0 C. 120^0 D. 150^0
14. Find the locus of a point which moves such that its distance from the line y = 3 is a constant k. A. y = 3 + k   B. y = 3 – k   C. y = 3 + k   D. y = k – 3
15. From the following list of type vi mutation, identify the one that is hereditary:
    A. genetic mutation   B. somatic mutation   C. germinal mutation   D. gametic mutation
16. Which of these would not be a limiting factor in photosynthesis?
    A. O_2 B. CO_2 C. chlorophy   D. light
17. In a cell digestive enzymes mostly occur in A. ribosome   B. lysosome   C. mitochondria   D. plastids
18. Which of the following factors is not associated with aquatic habitat?
    A. temperatureB. light intensity   C. humidity   D. turbidity
19. Terrestrial orsms which are capable of maintaining their body temperatures constant within fairly close limits are referred to as   A. thermoclines   B. pornotherms   C. polikilotherms   D. eurytherms
20. Which of the following statements is not true of a climax vegetation? A. is ecological phenomenon   B. is as table community   C. eliminates competition   D. results from succession
21. The causative organisms of sleeping sickness is the   A. trypanosome   B. plasmodium   C. vibrio bacterium   D. penicillin

From the words lettered A to D, choose the word or group of words that best completes each of the following sentences

22. Adamu is a very good friend on ..... I can rely   A. who   B. whose   C. which   D. whom

23. I ought ………. the letter by now. A. to be sent   B. to have being sent   C. to have sent   D. to have to send
24. Edna's fever was so acute that she ………. an injection A. had to have   B. had to had   C. must have   D. ought to have
25. I know of a cow ………… has only three legs. A. whom   B. which   C. who   D. of which
26. Ranti: This is not my key. Ayo: Then ………. Is it? A. of which   B. whose   C. who's   D. whom
27. There was no meat in the market ……… Ada bought some fish.
    A. so   B. unless   C. since   D. whereas
28. The police vehicles raced ………. full speed with their sirens blaring.
    A. on   B. with   C. at   D. in
29. Tutu liked to read detective novels to take his mind ……… his worries.
    A. off   B. away   C. out of   D. from
30. I don't know what to do with these children. They are always fighting ………..
    A. themselves   B. myself   C. one another   D. each of them
31. Wale couldn't have said a thing like that …… A. could he? B. did he? C. can he? D. would he?
32. If she had known, she wouldn't have come ……… A. would she?   B. wasn't it?   C. wouldn't it?   D. couldn't she?
33. The separation of oil and water with different boiling points can best be achieved by:
    A. fractional distillation   B. decantation   C. evapouration   D. using a separating funnel
34. Calculate the minimum volume of oxygen that is required for the complete combustion of a mixture of $20cm^3$ of CO and $25cm^3$ of hydrogen.
    A. $45cm^3$ B. $22.5cm^3$ C. $20cm^3$ D. $10cm^3$
35. An increase in temperature causes an increase in the pressure of a gas because there is an increase in the   A. average velocity of the gas molecules   B. number of collisions between the gas molecules   C. density of the gas molecules   D. free mean path between each molecule and the other.
36. A liquid begins to boil when   A. its vapour pressure is equal to the vapour pressure of its solid at a given temperature   B. molecules start escaping from the surface   C. its vapour pressure equals the atmospheric pressure   D. its volume is slightly increased
37. If the relative rate of diffusion of a gas is 0.25 and that of Cl under the same condition is 0.20. calculate the relative molecular mass of the gas.
    A. 22.7   B. 45.4   C. 68.1   D. 90.8
38. The following molecules contain hydrogen bonding EXCEPT A. ammonia   B. ethanoic acid   C. hydrogen fluoride   D. water
39. If $20cm^3$ of distilled water is added to $80cm^3$ of $0.50mol/dm^3$ HCl solution, the new concentration of the acid is A. $0.10mol/dm^3$ B. $0.20mol/dm^3$ C. $0.40mol/dm^3$ D. $2.00mol/dm^3$
40. What is H_2O_2 acting as in the equation? H_2O_2 + $2Fe^{2+}$ → $2Fe^{3+}$. A. oxidizing agent   B. reducing agent   C. an acid   D. a base
41. A 12V battery supplying a current of 20A was used to melt 1.5kg of ice at 0^0C. Calculate the time required if the latent heat of fusion of ice is 336 x 10J/kg
    A. 35.0min   B. 3.5min   C. 76min   D. 21.0min
42. The light from the sun reaches the earth mainly by   A. convection   B. conduction   C. radiation   D. reflection
43. One valid assumption of the kinetic theory of gases is that: A. the molecules are in random motion and the number of collision is constant   B. the number of molecules increases with the pressure   C. the molecules of the gas are all identical and are very small in size   D. the number of molecules increases with temperature
44. An astronomical telescope is said to be in normal adjustment when the   A. eye is accommodated   B. focal length of the objective lens is longer than that of the eye piece   C. final image is at the near point of the eye   D. final image is at infinity
45. Which of the following parts of a cell is living? A. cell wall   B. calcium oxalate   C. food vacuole   D. mitochondria
46. Cells without an organized nucleus are called   A. heterokaryote   B. eukaryote   C. prokaryote   D. synkaryote
47. The sites for energy transfer within a cell are known as   A. golgi apparatus   B. parenchyma   C. mitochondria   D. nucleolus

48. Food and dissolved oxygen pass from the water directly into the amoeba by a process called: A. transport   B. diffusion   C. fission   D. transpiration
49. Which one of these functions is not performed by the nervous system?
    A. receive sensory input from internal and external environment   B. digestion   C. integration   D. response to stimuli
50. In man, gas exchange occurs in the   A. heart   B. white blood cells   C. lungs   D. kidney

SOLUTION TO ABU 2012/2013 POST-UTME

1. A   2. C   3. C   4. A   5. B   6. A

7. Surface tension = $\dfrac{\text{force}}{\text{Length}} = \dfrac{F}{L} = FL^{-1}$ Ans: A   8. D   9. D   10. D

11. numbers: 2.4, 2.1, 1.6, 2.6, 2.6, 3.7, 2.1, 2.6
    Arranging in ascending order: 1.6, 2.1, 2.1, 2.4, 2.6, 2.6, 2.6, 3.7
    Mode (w) = number with highest occurrence = 2.6
    Median (z) = middle number = $\dfrac{2.4 + 2.6}{2}$ = 2.5
    Then (3w, 2z) = [3(2.6), 2(2.5)] = (7.8, 5.0)   Ans: C

12. A = ½ (a + b)h; 42 = ½(6 + 8)h
    42 = 7h;   ∴ h = $^{42}/_7$ = 6cm   Ans: A

13. Length of arc = $^{\theta}/_{360} \times 2\pi r$
    22 = $^{3y}/_{360} \times 2 \times ^{22}/_7 \times 7$
    ∴ y = $\dfrac{22 \times 360}{3 \times 2 \times 22}$ = 60⁰   Ans: B

14. C   15. B   16. A   17. A   18. D   19. C   20. C
21. A   22. D   23. C   24. C   25. B   26. B   27. A
28. A   29. A   30. A   31. A   32. A   33. D   34. D
35. B   36. A

37. From Graham's law of gaseous diffusion,
    $\dfrac{R_{gas}}{R_{Cl}} = \dfrac{\sqrt{M_{Cl}}}{\sqrt{M_{gas}}}$
    $\dfrac{0.20}{0.25} = \dfrac{\sqrt{M_{gas}}}{\sqrt{71}}$ = 0.8
    $M_{gas} = 0.8^2 \times 71$ = 45.44   Ans: B   38. C

39. From dilution equation: $C_1V_1 = C_2V_2$
    Where C_1 = 0.5, V_1 =80cm³, C_2 = ?, V_2 = 20cm³ + 80cm³ = 100cm³
    0.5 × 80 = C_2 × 100
    ∴ $C_2 = ^{40}/_{100}$ = 0.4mol/dm³   Ans: C   40. A

41. V = 12v, I = 20A, m = 1.5kg, l = 336 × 10¹
    From latent heat of fusion, Q = IVt = ml
    20 × 12 × t = 1.5 × 336 × 10¹
    ∴ t = $\dfrac{1.5 \times 336 \times 10^1}{20 \times 12}$ = 21min   Ans: D

42. D   43. D   44. B   45. D   46. B   47. C   48. D
49. B   50. C

AHMADU BELLO UNIVERSITY, ZARIA
POST UNIVERSITY SCREENING 2010/2011
Time allowed: 1 hour

USE OF ENGLISH
From the words or group of words lettered A to D, choose the word or group of words that best complete each of the following sentences

1. … of the five boys was able to show me the way to the zoo. A. none   B. neither   C. any   D. some
2. This …. be David's handwriting; I know his handwriting well enough. A. may   B. will   C. ought   D. can't
3. ……thing she had in the room were thrown out. A. so few   B. the few   C. all few   D. very few
4. There are five boys …… A. of which two were beaten   B. whom two were beaten   C. two of whom were beaten   D. of whom two of them were beaten
5. This is the man …… told me the story. A. whom I said   B. who I said   C. said that he   D. who I said he
6. Many students find mathematics …….. than English. A. difficult   B. too difficult   C. very difficult   D. more difficult
7. It is such a bad place ……… I will never dream of going there another time. A. therefore   B. thus   C. that   D. then
8. He has not been seen by his parent ……. last month. A. since   B. for   C. getting   D. since over
9. The ……, came here last week. A. handsome tall young man   B. young tall handsome man   C. tall handsome young man   D. young handsome tall man
10. The activities marking the golden jubilee celebration of the club were …… with a party.
   A. rounded off   B. rounded over   C. rounded through   D. rounded up

Choose the option that is most nearly opposite in meaning to the underlined word and that will, at the same time, correctly fill the gap in the sentence.

11. To encourage productivity we must reward industry and ……. laziness A. withhold   B. withdraw   C. punish   D. oppose
12. It is quite <u>customary</u> to introduce the guest speaker but ….. to insult him. A. illegally   B. impolite   C. unusual   D. useless
13. I <u>encourage</u> my younger brothers to take on law as a profession while ……. my sister from doing so. A. warned   B. dissuaded   C. persuaded   D. helped
14. Olu was able to kindle the fire which my father had to ……. later. A. switch   B. extinguish   C. destroy   D. ignite
15. It is curious how Bayo can be so <u>carefree</u> in his ways when his brother is so ……
   A. meticulous   B. eccentric   C. easy-going   D. indifferent

Choose the option that best explain the underlined idiomatic expression in each sentence

16. Mr. John has always managed <u>to keep his head oppression</u> A. keep his head above water while swimming   B. known the technique of swimming   C. stay out of financial difficulty   D. he is trying to pay up it borrowed money
17. The men eventually <u>get their own back</u> on their oppression. A. strike   B. have their revenge on   C. beat up   D. abuse
18. He <u>went off the rails</u> as soon as he heard of his failure in the last examination.
   A. became annoyed   B. wept bitterly   C. became disorganized   D. lost consciousness
19. She is <u>eating her heart out</u> for a sailor who is away at the sea. A. long for   B. quarrellingg with   C. fuming about   D. hating

20. You can't <u>make bricks without straw.</u> A. use a straw for making bricks   B. afford not to have all the necessary materials   C. seek a leader   D. erect a brick without straws

PHYSICS

21. Which of these statements is correct about cathode rays. They are fast moving
    A. atoms   B. neutrons   C. electrons   D. ions
22. Which of the following has the highest surface tension. A. soapy water   B. cold water
    C. warm water   D. salt water
23. A truck traveling with a velocity of 40m/s applies the brakes and comes to a halt after 20s. what is the distance traveled by the truck before coming to a halt
    A. 40m   B. 800m   C. 400m   D. 10m
24. If the linear expansivity of a metal rod is 4×10^{-5} per ^0C, what will be the new length of the rod if it is heated from 15^0C to 95^0C from its original length of 20cm.
    A. 0.064cm   B. 0.64cm   C. 20.64cm   D. 20.064cm
25. 44kJ heat was used in raising the temperature of 2kg of paraffin oil from 360k to 370k. calculate the specific head capacity of paraffin oil. A. 2.2J/kg/K   B. 2.2×10^3J/kg/K
    C. 2.2×10^5J/kg/K   D. 220J/kg/K
26. A simple machine overcomes a load 4000N when a force of 200N is applied. If the velocity ratio of the machine is 25, calculate the efficiency of the machine.
    A. 1.25%   B. 80%   C. 125%   D. 0.8%
27. A long sighted person is to read a book held at a distance of 20cm from the eyes. Which of the following will the person require to read the book with ease? A. nothing
    B. concave lens   C. convex lens   D. concave mirror
28. An object at the bottom of a pool of iquid 10m deep is seen by an observer as if it is at 8m deep. What is the refractive index of the liquid.A. 0.25 B. 0.20 C. 1.25 D. 0.8
29. Which of the following has the highest surface tension? A. soapy water   B. cold water
    C. warm water   D. salt water
30. The emf developed in a circuit is directly proportional to the rate of change of magnetic flux. The above was a finding from A. Maxwell   B. Faraday   C. Ampere   D. Lenz

BIOLOGY

31. Which of these is a sense organ? A. spleen   B. mouth   C. eye   D. heart
32. What is the function of the vas deferens in the male reproductive organ?
    A. transports sperm only   B. transports urine and sperm   C. transports urine only
    D. none of the above
33. Food materials manufactured in plants are transported through the
    A. xylem   B. phloem   C. cambium   D. cortex
34. When a red blood cell is placed in water, the process of water movement is
    A. osmosis   B. diffusion   C. imbibitions   D. active transport
35. The enzyme contained in bile is   A. trypsin   B. lipase C. ptyalin D. lactase
36. Which of these factors in the blood is responsible for blood clotting?
    A. fibrinogen   B. heparin   C. plasma   D. red blood cells
37. Fat soluble vitamins are stored in   A. liver   B. spleen   C. pancreas   D. skin
38. The unit of th nervous system is   A. neuron   B. axon   C. dendrite   D. myelin sheet
39. Moulting involves the   A. shedding of exoskeleton in insects in order to replace with better ones   B. shedding of exoskeleton in insects in order to grow new ones   C. shedding of exoskeleton in insects in response to seasonal changes   D. none of the above
40. Pepsin is a digestive enzyme which breaks   A. sucrose into glucose and fructose
    B. carbohydrates into simple sugars   C. protein into peptones   D. fats into glycerol and fatty acids

CHEMISTRY

41. If the rate law obtained for a given reaction is given as rate = $K[X]^n[Y]^m$, what is the overall order of the reaction. A. nm   B. $^n/_m$ C. n + m   D. n – m
42. A molecular formula shows .... in a molecule. A. the elements present   B. the number of atoms of each element   C. cations and anions   D. chemical symbols and number of atoms
43. Give the total mass of copper in 1gram of copper (II) sulphate. [Cu = 40, S = 32, O = 16] A. 0.25g   B. 0.50g   C. 10g   D. 2.5g
44. $^{114}_{55}Cs \rightarrow {}^A_ZE + {}^4_2\alpha$. Find the value of A and Z in the equation above.
    A. 119, 53   B. 110, 57   C. 110, 53   D. 110, 58
45. How many moles of H_2 molecules are needed to convert 5mole of O_2 molecules to water? A. 5 mole H_2 B. 10mole H_2 C. 15mole H_2 D. 20mole H_2
46. $^{226}_{88}Ra \rightarrow {}^x_{86}Rn + \alpha$. What is the value of x in the nuclear reaction above?
    A. 220   B. 222   C. 226   D. 227
47. When naphthalene on heating changes from solid state directly to the gaseous state, it undergoes   A. sublimation B. evaporation C. combustion D. decomposition
48. Which of the following is an electrolyte? A. alcohol   B. sodium ethanoate   C. solid potassium hydroxide   D. mercury
49. The equation: $^{14}_7N + {}^4_2He \rightarrow {}^{17}_8O + {}^1_1P$ represents   A. nuclear fusion   B. nuclear fission   C. artificial radioactivity   D. nuclear fission using positron
50. Which of the following is a general method of preparing acids? A. direct combination of constituent elements   B. double decomposition involving a salt solution   C. reaction between an anhydride and water   D. reaction between a base and an amphoteric oxide   E. decomposition of hydroxides followed by neutralization

SOLUTION TO ABU 2010/2011 POSTUTME

ENGLISH

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

PHYSICS

21. C	22. B	23. A	24. D	25. B	26. B	27. C
28. C	29. B	30. B				

BIOLOGY

31. C	32. A	33. B	34. A	35. ****	36. A	37. A
38. A	39. B	40. C				

CHEMISTRY

41. C	42. D	43. A	44. C	45. B	46. C	47. A
48. B	49. C	50. A				