



OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA.
DEPARTMENT OF CHEMISTRY.

B.Sc DEGREE MID-RAIN SEMESTER EXAMINATION 2022/2023 ACADEMIC SESSION
ICH 206: CHEMISTRY OF DYE STUFF AND PIGMENTS

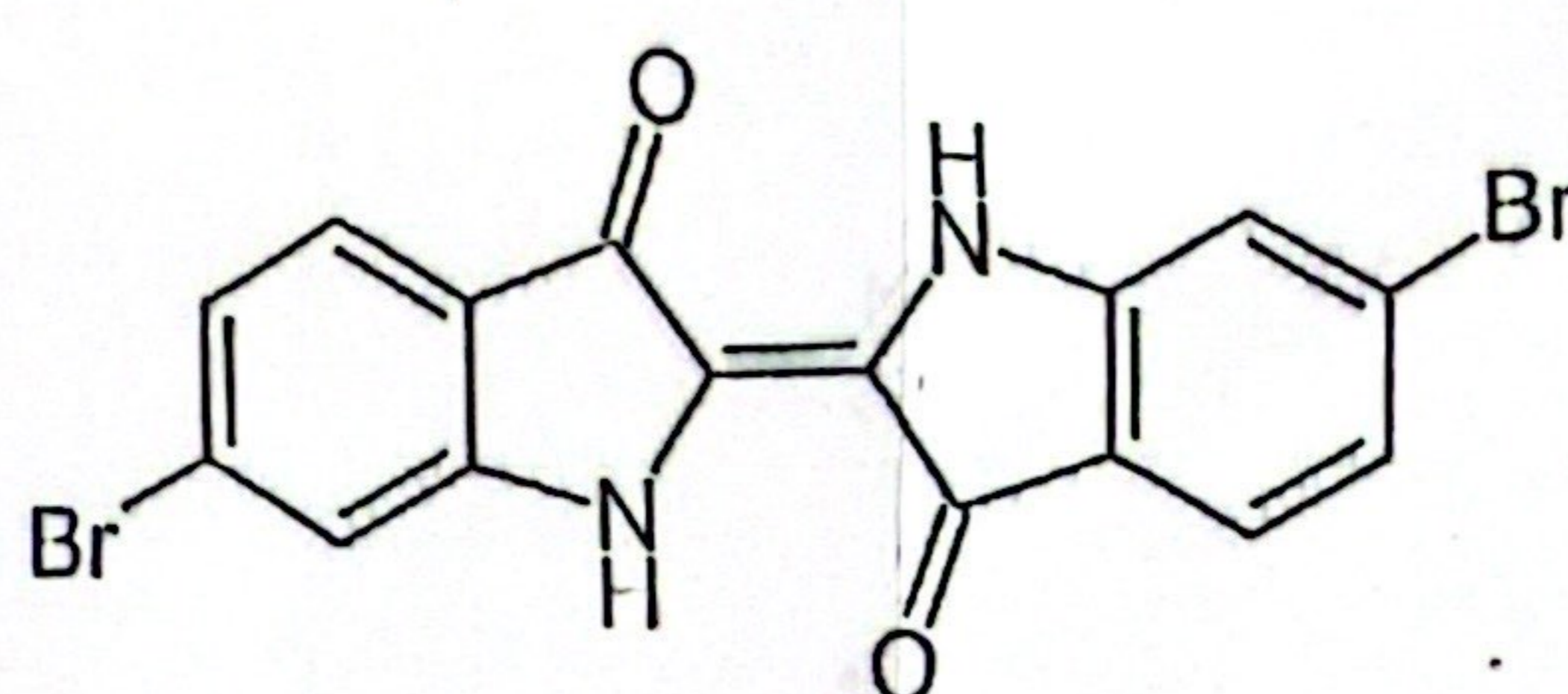
ANSWER ALL QUESTIONS

TIME ALLOWED: 40 minutes

Instructions: Write your Name, Registration Number and append your signature on your answer scripts.

Short and precise answers are preferred.

- 1a. Tyrian purple is a biological pigment obtained from Murex snails and it is composed of 6,6-dibromoindigo with the structure below. Give reasons why it is appropriate for use as a colour imparting agent for paints and fabrics stating the condition(s) that will make it appropriate for use in the two instances. Also predict the process that could be responsible for the fading of such colours when exposed to sunlight. Use equations to back up your claims.



Tyrian Purple

- b. What chemical property apart from solubility differentiates organic pigments from the inorganic ones. Which of these two would exhibit a higher colour strength? Which of these two colour imparting agents is more prone to loss of colour clearly stating the chemical process involved. Give reasons for your answers.
- c. You are provided with the following potassium compounds; $K_2Cr_2O_7$, $K_2Cr_2O_4$ and K_3CrO_4 . With reasons:
- predict the ones whose transition metal content would contribute to the colour they display.
 - state if the colours displayed would be similar colours or not.
 - arrange the compounds in an increasing order of colour intensity.
- d. You are provided with two glass samples A and B. Take an intense look at the samples and use them to answer the following questions:
- What does sample A have in common with sample B?
 - State their major differences and what is responsible for such.
 - What determines the colours observed in the sample?
 - If yellow light is focused on the two samples what colours are meant to be observed?
 - If the samples were used in the manufacture of glass bottles and edible items stored in them. In which of the bottles would its content exhibit a longer shelf life.

Give reason(s) for all your answers.



Dyes
Pig

A + G 2

Organic pigments

Photo-degradation

Potassium
meet
can

Phosphorus
K₂Cr₂O₇