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This question paper contains three printed pages.

Your Roll No.....

B.Sc. (Hons) / I
BIOCHEMISTRY : Paper II
 (Inorganic and Organic Chemistry)
 (Admissions of 2000 and onwards)

C

Time : 3 Hours

Max. marks : 60

(Write your Roll No. on the top immediately on receipt of this question paper).

Use separate answer books for Section A and Section B.

Attempt six questions in all, selecting three questions from each section.

Section A : INORGANIC

1.(a) Write IUPAC names of the following complexes:

- (i) $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$
- (ii) $\text{K}_2[\text{Ni}(\text{CN})_4]$
- (iii) $\text{K}_3[\text{Fe}(\text{CN})_6]$
- (iv) $[\text{CoCl}_2(\text{NH}_3)_4]_3[\text{Cr}(\text{CH}_3)_6]$

(4)

(b) Write the formulae of the following complexes:

- (i) Sulphatetetraamminecobalt (II) nitrate
- (ii) Potassium pentacyanonitrosyl cobaltate (II)
- (iii) Trisoxalatochromium (III) chloride

(3)

(c) What is a ligand? Give one example each of bidentate, tridentate and hexadentate ligand.

(3)

2(a). Explain the following (Any **three**).

- (i) Pure HCl does not conduct electricity but its aqueous solution does.
- (ii) Electron affinity of Chlorine is more than that of fluorine.
- (iii) Ionic compounds are crystalline in nature.
- (iv) Barium sulphate is insoluble in water whereas magnesium sulphate is soluble.

(2x3)

(b). Predict the shapes of the following molecules on the basis of VSEPR theory

- (i) XeOF_2
- (ii) NCl_3
- (iii) PF_5
- (iv) SF_6

(4)

- 3.(a) (i) Define Lattice Enthalpy.
 (ii) Write Born-Landé equation and define the terms involved in it. (1½ x 2)
- (b) What is isomerism? How many types of isomerism are shown by co-ordination compounds? Explain any two types of isomerism with the help of one example each. (4)
- (c) On the basis of VBT, predict whether the following compounds are paramagnetic or diamagnetic. Calculate their magnetic moments also:
- (i) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$
 (ii) $\text{K}_2[\text{Fe}(\text{CN})_6]$ (3)

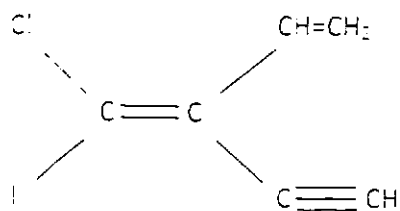
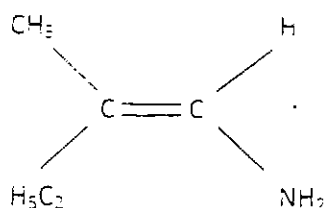
4. Write short notes on any **four** of the following:

- (i) Werner's theory
- (ii) Fajan's rules
- (iii) Hydrogen bonding
- (iv) Resonance in inorganic compounds
- (v) Electron sea model for metallic bond
- (vi) Myoglobin

(2½ x 4)

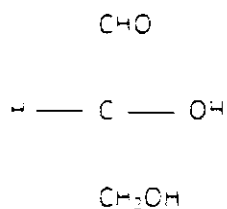
Section B : ORGANIC

1(a) Assign E and Z designation for the following:



(2)

- (b) Dipole moment of trans 1-chloropropene is higher than its cis isomer. Explain. (2)
- (c) Write keto-enol forms of ethyl acetoacetate. (2)
- (d) What is the difference between enantiomers and diastereomers? (2)
- (e) Assign R or S to the following:



(2)

2. Give reasons for the following (Do *any four*)

- (a) Cyclopentadienyl anion is aromatic.
- (b) Ethyl chloride undergoes hydrolysis more readily than Chlorobenzene.
- (c) $-\text{NO}_2$ group is meta directing towards electrophilic substitutions.
- (d) 2-Butene is more stable than 1-butene.
- (e) Phenyl acetaldehyde undergoes aldol condensation.

(2 ½ x 4)

3(a). Give the structure of alkene that on ozonolysis give 2 moles of $\text{CH}_2=\text{O}$ and 1 mole of CH_3COCHO .

(2)

(b) Give one chemical test to distinguish $\text{CH}_3\text{CH}_2\text{CHO}$ from CH_3COCH_3 .

(2)

(c) Explain why acetaldehyde is more reactive than Benzaldehyde towards nucleophilic addition.

(2)

(d) Explain why phenol is more acidic than methanol.

(2)

(e) What is the product of the reaction of Benzaldehyde and acetaldehyde in NaOH?

(2)

4. Write short notes on any *four* of the following:

- | | |
|-----------------------|--------------------------------|
| (a) Perkin reaction | (b) Hofmann Bromamide reaction |
| (c) Chirality | (d) Markownikov's rule |
| (e) Iodoform reaction | (f) Wurtz reaction |

(2 ½ x 4)