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PA—04—2024

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

MARCH/APRIL, 2024

(CBCS/New Pattern)

CHEMISTRY

Paper XII

(Organic and Inorganic Chemistry)

(Friday, 05-04-2024)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

N.B. :— (i) Attempt all questions.

(ii) Figures to the right indicate full marks.

1. Solve any *three* of the following : 3×5=15
- (a) Define ligands. Give their classification on the basis of denticity.
 - (b) What is complex ion ? How does Werner's theory of co-ordination compound account for ionic nature of the complex $\text{CoCl}_3 \cdot 6\text{NH}_3$?
 - (c) Describe Rubidium complexes used for the treatment of cancer.
 - (d) What is EAN ? Calculate EAN of the central metal ion in the following complexes and write their IUPAC names; $[\text{Ni}(\text{CO})_4]$ and $[\text{Cu}(\text{CN})_4]^{3-}$.
 - (e) Write a short note on anti-arthritis drugs.

P.T.O.

2. Solve any *three* of the following :

3×5=15

(a) Give preparation of Furan from :

- (i) Mucic acid
- (ii) Succinaldehyde.

What is the action of the following on Furan ?

- (i) $\text{HNO}_3/(\text{CH}_3\text{CO})_2\text{O}$
- (ii) $2\text{H}_2/\text{Raney Ni}$

(b) What are dyes ? Give qualities of a good dye. Explain synthesis and uses of methyl orange.

(c) What are chemotherapeutic agents ? Explain :

- (i) Antibacterials
- (ii) Antifungals
- (iii) Anaesthetics with suitable example.

(d) What happens when pyridine is reacted with the following reagents?

- (i) NaNH_2
- (ii) $\text{HNO}_3 + \text{H}_2\text{SO}_4$
- (iii) $\text{Br}_2/\text{charcoal}$ at 300°C .

(e) What are alkaloids ? Give general properties of alkaloids.

3. Solve any *two* of the following :

2×5=10

(a) Explain what happens when :

(i) Furan is reacted with mixture of CO and HCl in the presence of AlCl_3 .

(ii) Pyrrole is reacted with SO_3 in presence of Pyridine.

(iii) Thiophene is reacted with $\text{HgCl}_2/\text{CH}_3\text{COONa}$.

(b) Write short notes on any *three* of the following :

(i) Tocopherols

(ii) Thiamine

(iii) Retinol

(iv) Vitamin C

(v) Ergocalciferol.

(c) What are pesticides ? Give synthesis and uses of :

(i) Chloranil

(ii) Alachlor.

(d) Write a short note on pharmacodynamic agents.