

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

BMS COLLEGE FOR WOMEN
BENGALURU – 560004

V SEMESTER END EXAMINATION – JAN/FEB- 2024

B.Sc.- INORGANIC AND ORGANIC CHEMISTRY
(NEP Scheme 2021-22 onwards)

Course Code: CHE5DSC05

Duration: 2½ Hours

QP Code: 5022

Max. Marks: 60

Instructions: 1. Question paper has three Parts. Answer all the parts.

2. Write chemical equations and diagrams wherever necessary.

PART-A

Answer any FIVE of the following questions. Each question carries TWO marks. (5X2=10)

1. What is meant by ionization isomerism? Give one example.
2. The λ of a radioactive element is 1.4hr^{-1} . What is $t_{1/2}$?
3. How would you convert ethyl acetate to ethyl acetoacetate?
4. Explain Gabriel's Phthalimide reaction with an example.
5. What is hapticity? Give an example of a trihapto ligand.
6. Discuss the role of a coolant and control rod in nuclear reactors.
7. Explain the action of water on acetic anhydride

PART-B

Answer any Four of the following questions. Each question carries FIVE marks. (4X5=20)

8. a. Apply 18- electron rule to $[\text{Co}_2(\text{CO})_8]$ and explain its stability.
b. Draw the isomers of the compound $[\text{PtCl}_2(\text{NH}_3)_2]$. (3 + 2)
9. a. Outline alumina thermite process.
b. Explain artificial radioactivity with an example. (3 + 2)
10. a. Explain Wolff Kishner reduction reaction with an example.
b. Draw the keto-enol tautomers of ethyl acetoacetate. (3 + 2)
11. a. Arrange the following in increasing order of basic strength and give reason.
i) NH_3 ii) CH_3NH_2 iii) $(\text{CH}_3)_2\text{NH}$
b. Explain carbylamine reaction with an example. (3 + 2)
12. a. Predict the magnetic moment of $[\text{Co}(\text{NH}_3)_6]^{3+}$ based on CFT.
b. What is stability belt? How does a nucleus behave if it has n/p ratio above the belt? (3 + 2)

13. a. Write the mechanism of Wagner Meerwin rearrangement
b. How is BDC converted to p-hydroxy-azo benzene? (3 + 2)

PART-C

Answer any Three of the following questions. Each question carries TEN marks
(3x10=30)

- 14.a. Illustrate the splitting of d-orbitals in an octahedral complex on the basis of Crystal field theory.
b. List the Spectrochemical series and give its significance.
c. Depict optical isomerism in $[\text{Cr}(\text{ox})_3]^{2-}$.
d. EDTA is used as a remedy for heavy metal-ion poisoning. Justify. (3+3+2+2)
15. a. Identify the target or projectile in the following:
i) ${}_{20}\text{Ca}^{40} + \text{_____} \rightarrow {}_{21}\text{Sc}^{40} + {}_0\text{n}^1$
ii) $\text{_____} + {}_1\text{H}^1 \rightarrow {}_{12}\text{Mg}^{24} + {}_2\text{He}^4$
b. Why do you think desulphurization of steel has to be carried out?
c. Indicate the composition of (i) Brass (ii) Cupronickel
d. How would you explain that Chromium alters the properties of steel?
e. What is the principle of C – 14 dating? (2+2+2+2+2)
16. a. Write the mechanism for the conversion of Benzaldehyde to benzoin
b. Compare the reactivity of reduction using LiAlH_4 and NaBH_4 .
c. Making use of malonic ester, how is a dicarboxylic acid prepared?
d. Illustrate an example for Claisen Condensation reaction. (4+2+2+2)
17. a. Predict what happens when
i. Tartaric acid is reduced with HI.
ii. Acetamide is reduced with LiAlH_4 .
b. How is phenol obtained from aniline?
c. Distinguish 1° and 3° amines by a chemical test.
d. Discuss the action of heat on citric acid. (4+2+2+2)
18. a. Apply VBT to $[\text{Cr}(\text{NH}_3)_6]^{3+}$ and comment on its geometry and magnetic property.
b. In froth floatation process, pine oil and aniline are added. Explain.
c. Explain saponification reaction with an example.
d. Explain Hofmann rearrangement. (4+2+2+2)
