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Reg. No. :

Code No. : 20373 E Sub. Code : EMCH 52

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Fifth Semester

Chemistry — Core

INORGANIC CHEMISTRY – I

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. If different positions of a functional group on the same carbon chain is known as
 - (a) Chain isomerism
 - (b) Metamerism
 - (c) Tautomerism
 - (d) Position isomerism

2. Eriochrome Black-T is a/an
 - (a) Acid base indicator
 - (b) Complexometric indicator
 - (c) Metal-iron indicator
 - (d) Both (a) and (b)
3. The energy required to convert one mole of an ionic solid into gaseous ionic constituents is known as
 - (a) Crystal field stabilisation energy
 - (b) Ionization energy
 - (c) Lattice energy
 - (d) Activation energy
4. A stability constant is an/a
 - (a) Plank constant
 - (b) Equilibrium constant
 - (c) Gas constant
 - (d) Rydberg constant

5. An example for dinuclear carbonyls is
(a) $\text{Fe}_3(\text{CO})_{12}$ (b) $\text{Co}_4(\text{CO})_{12}$
(c) $\text{Ir}_2(\text{CO})_8$ (d) $\text{Ni}(\text{CO})_4$
6. The EAN value of $\text{Fe}(\text{CO})_5$ is
(a) 32 (b) 42
(c) 52 (d) 36
7. Lanthanide compounds are primarily
(a) Diamagnetic
(b) Ferromagnetic
(c) Anti-Ferro magnetic
(d) Para magnetic
8. The primary ore of uranium is
(a) Pitchblende (b) Monazite
(c) Thorite (d) Bauxite
9. Silicones are excellent
(a) conductors
(b) insulators
(c) semi conductors
(d) none of the above

10. Poly sulfides exhibit
(a) Chemical resistance
(b) Weathering resistance
(c) Good adhesion
(d) All the above

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Explain : Werner's coordination theory.
Or
(b) How will you estimate the hardness of water using EDTA?
12. (a) How the spectrochemical series is important?
Or
(b) List out the factors affecting the stability of a complex ion.
13. (a) Outline the properties of binary carbonyls.
Or
(b) Discuss the physical and chemical properties of ferrocene.

14. (a) Demonstrate the magnetic properties of lanthanides.

Or

(b) List out the properties and uses of ceric ammonium sulphate.

15. (a) Explain : Preparation and properties of silicones.

Or

(b) Give the industrial applications of inorganic polymers.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) (i) Explain : Isomerism in coordination compounds. (4)

(ii) How will you apply DMG in gravimetric analysis? (4)

Or

(b) (i) Discuss on IUPAC nomenclature of coordination compounds. (6)

(ii) Define coordination number. (2)

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17. (a) Demonstrate crystal field splitting of energy levels in octahedral and tetrahedral complexes.

Or

(b) (i) Demonstrate Jahn-Teller effect. (5)

(ii) Write a note on stability constants. (3)

18. (a) Explain : structure and bonding in carbonyls of Ni and Fe.

Or

(b) Explain : structure and bonding in carbonyls of Ru and Os.

19. (a) (i) Write a note on lanthanide contraction. (5)

(ii) Explain properties and uses of thorium. (3)

Or

(b) Discuss on preparation and uses of thorium dioxide and Uranyl acetate.

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20. (a) How will you prepare phosphorous based polymers and list out its properties?

Or

(b) Explain : Boron based polymers and list out its properties.
