

Code No. : 20311 E Sub. Code : AMCH 51

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Fifth Semester

Chemistry — Core

INORGANIC CHEMISTRY – II

(For those who joined in July 2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions, choose the correct answer.

- Noble gases are _____.
(a) Monoatomic (b) Diatomic
(c) Triatomic (d) None of the above
- Shape of XeF_2 molecule is _____.
(a) Square planar (b) Trigonal planar
(c) Pyramidal (d) Linear
- Which of the following groups of transition metals are called coinage metals?
(a) Cu, Ag, Au (b) Ru, Rh, Pd
(c) Fe, Co, Ni (d) Os, Ir, Pt

- Half filled d-orbitals are observed in _____.
(a) Sc^{3+} (b) Mn^{2+}
(c) Fe^{2+} (d) Cr^{3+}
- The actinides showing +7 oxidation state are _____.
(a) U, Np (b) Pu, Am
(c) Np, Pu (d) Am, Cm
- The separation of lanthanides by ion exchange method is based on _____.
(a) Size of ions
(b) Oxidation state of the ions
(c) Solubility of their nitrates
(d) Basicity of hydroxides of lanthanides
- Zone refining is used for the
(a) concentration of an ore
(b) reduction of metal oxide
(c) purification of metal
(d) reduction of metal sulphide

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- The purpose of smelting an ore is _____.
(a) To obtain an alloy
(b) To oxidise it
(c) To separate volatile impurities
(d) To reduce it
- A mixture containing Cu^{2+} and Ni^{2+} can be separated for identification by
(a) passing H_2S in acid medium
(b) passing H_2S in alkaline medium
(c) passing H_2S in neutral medium
(d) passing H_2S in dry mixture
- The indicator used in iodimetry is _____.
(a) Methyl orange (b) Starch
(c) Phenolphthalein (d) KI

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- (a) Discuss about structure and bonding in Xenon oxide compounds.
Or
(b) Describe briefly clathrate compounds and its uses.

- (a) Outline the study of Zinc group elements in the periodic table.
Or
(b) Explain preparation, properties and uses of Wilkinson catalyst.
- (a) Discuss the magnetic properties of f-block elements
Or
(b) Explain the preparation, properties and uses of ceric ammonium sulphate.
- (a) Write a note on magnetic separation method for the concentration of ore.
Or
(b) Explain about extraction of Lithium from its ore.
- (a) What is common ion effect? Describe its application in qualitative analysis.
Or
(b) Describe the theory of Acid-base titration titrations.

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PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Discuss the preparation and properties and structure of XeF_4 , XeF_6 .

Or

- (b) (i) Explain the preparation and properties of $XeOF_4$.

(ii) Write a short note on isolation of noble gases from the atmosphere.

17. (a) Discuss the general characteristics of d-block elements.

Or

- (b) Write a note on:

(i) Prussian blue

(ii) Sodium nitroprusside

18. (a) What are lanthanides? Explain solvent extraction method for the separation of lanthanides.

Or

- (b) Give the preparation, properties and uses of ThO_2 .

19. (a) How does vanadium occur in nature? Describe the extraction of vanadium from Carnonite ore.

Or

- (b) Explain Van-Arkel de Boer method and Electrolysis method for purification of metals.

20. (a) (i) How are interfering radicals oxalate and Borate eliminated?

(ii) Explain the theory of complexometric titration.

Or

- (b) Explain about co-precipitation and post precipitation.