

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Sixth Semester)

Branch – CHEMISTRY

INORGANIC CHEMISTRY-II

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Which of the following lanthanoids ions is diamagnetic?
(i) Eu^{2+} (ii) Sm^{2+}
(iii) Yb^{2+} (iv) Ce^{2+}
- 2 Which ore is used to get maximum yield of uranium?
(i) Magnetite (ii) Bauxite
(iii) Monazite (iv) Pitchblende
- 3 What is the half- life period of a radioactive material if its activity drops to $1/25^{\text{th}}$ of its initial value in 20 years?
(i) 4 years (ii) 5 years
(iii) 6 years (iv) 10 years
- 4 The physical properties of the isotopes depend on the _____ of the atoms.
(i) Velocity (ii) Mass
(iii) Electronic configuration (iv) Valence electrons
- 5 Which one of the following is not a complex hydride?
(i) LiAlH_4 (ii) NaBH_4
(iii) LiBH_4 (iv) B_2H_6

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Discuss the position of lanthanides in the periodic table. List out any two important characteristics of lanthanides.
OR
b How are lanthanides extracted from monazite sand?
- 7 a Explain the electronic configuration, oxidation states of actinides.
OR
b Outline the preparation of any three transuranic elements.
- 8 a Summarize the properties and application of alpha, beta and gamma rays.
OR
b Describe the group displacement law. How is it applied for α , β and γ emission?
- 9 a Analyze the representation and structure of hydrogen and Neon isotopes.
OR
b How is electromagnetic method used in separation of isotopes?
- 10 a How are interstitial carbides prepared? Give their properties.
OR
b Classify solvents with respect to proton donor - acceptor behavior. Give examples.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Discuss lanthanide contraction. Explain its causes and consequences in detail.
OR
b Summarize the following
(i) Magnetic properties of lanthanides (ii) Separation of lanthanides
- 12 a Analyze (i) The position of actinides in the periodic table (ii) Colour and complex formation of actinides.
OR
b (i) Compare between lanthanides and actinides (ii) Outline the extraction and properties of Thorium.
- 13 a Outline (i) Wilson cloud chamber and (ii) Geiger Muller counter methods.
OR
b (i) Distinguish half life period and average life period (ii) Summarize radioactive series and contributions of radioactivity.
- 14 a Discuss Aston's mass spectrograph to identify isotopes.
OR
b Summarize (i) Thermal diffusion method and (ii) Structure of isobars.
- 15 a Discuss the preparation, properties and uses of ionic and covalent nitrides.
OR
b Analyze the reactions in non-aqueous solvents with reference to liquid ammonia.

Z-Z-Z

END