QP Code: D143663	Total Pages: 2	Name:
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FOURTH SEMESTER (CUFYUGP) DEGREE EXAMINATION, APRIL 2026

CHEMISTRY

CHE4CJ203: Inorganic Chemistry - II

2024 Admission onwards

Maximum Time: 2 Hours | **Maximum Marks: 70**

Section A

All Questions can be answered. Each Question carries 3 marks (Ceiling: 24 Marks)

1	s-block elements impart characteristic colours to a flame. Why? Explain why Beryllium and Magnesium do not show this property?
2	Define the inert pair effect. Explain why Pb^{2+} is more stable than Pb^{4+}?
3	Briefly explain the principle of Dewar's coconut charcoal adsorption method for the separation of noble gases.
4	Arrange HOCl, $HClO_2$, $HClO_3$ and $HClO_4$ in the increasing order of acid strength. Give reasons.
5	Why do transition metals show catalytic properties? Give three examples.
6	Differentiate between linkage isomerism and ionization isomerism with suitable examples for each.
7	Calculate the effective atomic number (EAN) of the metal in the following and check if they follow the 18-electron rule: (i) $[Ni(CO)_4]$ and (ii) $[Fe(CN)_6]^{4-}$
8	Discuss the factors affecting the stability of complexes.
9	Illustrate normal and inverse spinel structures with example.
10	What are Zeolites? Explain their "shape-selective" catalysis.

Section B

All Questions can be answered. Each Question carries 6 marks (Ceiling: 36 Marks)

11	Give the preparation, structure and uses of interhalogen compound of the types AB_3 and AB_5.
12	(a) Compare the Lewis acid strength of Boron halides. (b) Draw the structures of H_3PO_4 and H_3PO_2 and compare the acidity.
13	Explain the formation of non-stoichiometric compounds and interstitial alloys by transition elements.
14	What is Lanthanide contraction? Explain its causes and consequences.
15	What is the spectrochemical series? Discuss the factors affecting the magnitude of crystal field splitting (Δo).
16	Explain the Jahn-Teller theorem and its consequences for d^9 and high-spin d^4 octahedral complexes.
17	Explain the structure and bonding in cyclic triphosphazene ($P_3N_3Cl_6$). Is it aromatic?
18	What is polythiazyl $(SN)_x$? Mention its unique electrical property and its structure.

Section C	
Answer any ONE. Each Question carries 10 marks (1×10 = 10 Marks)	
19	Describe preparation, properties, structure and bonding of diborane.
20	(a) Discuss the postulates of valence bond theory (VBT). (b) Explain the geometry and magnetic behaviour of $[Co(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$ on the basis of VBT. (c) Outline the major limitations of VBT.