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Roll No.	Total No. of Pages : 02
Total No. of Questions : 19	
M.Sc. (Chemistry) (Campu	ıs) (2015 to 2017) (Sem1)
BASIC INORGA	NIC CHEMISTRY
Subject Co	de:CHL-401
M.Code	e : 51140
Time:3 Hrs.	Max. Marks:70
INSTRUCTIONS TO CANDIDATES :	

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains SIX questions carrying FIVE marks each and students have to attempt ALL questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- 1. Define Hall effect. What is its significance?
- 2. Draw the structures of (i) Zinc blende and (ii) Wurtzite.
- 3. What are the point groups for (i) $[Pt(NH_3)_4]Cl_2$ and (ii) COS?
- 4. Write the IUPAC names for (i) $K_3[Fe(ox)_3]$ and (ii) $[Co(NH_3)_5CI]Br$.
- 5. Draw crystal field splitting diagram for [Ni(CO)₄].
- 6. Write the Mulliken symbols for F and P state in an octahedral field.
- 7. How are polarizability of bridging anion and rate of transfer of electron related to each other?
- 8. The Q-value for the 3 He (n,p) is 0.76 MeV. What is the nuclidic mass of 3 He?
- 9. Identify isolobal pairs from the following:

CH₃, CH₂, CH, Cr(CO)₄, Mn(CO)₅, and Co(CO)₃

10. Calculate the spin magnetic moment of (i) $K_2[Ni(CN)_4]$ and (ii) $[FeF_6]^{3-1}$



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SECTION-B

- 11. What are magnetic materials? Describe its types.
- 12. Predict structures for (i) $B_2H_7^-$ (ii) $B_3H_8^-$ and (iii) $B_{10}H_{14}$. Also, show the calculations.
- 13. Give an account of a nuclear reactor.
- 14. What is chelate effect? How does the chelate effect help in increasing the stability of the coordination complexes? Explain with the help of at least two examples.
- 15. Discuss the mechanism of inner sphere redox reaction of coordination compounds.
- 16. Draw and explain the splitting of d-orbitals in a (i) square planar and (ii) an octahedral field.

SECTION-C

- 17. Explain the Jahn-Teller effect and sketch the splitting of the d-orbitals for a compressed and elongated octahedron. Also, discuss its consequences.
- 18. What is radioactivity and radioactive particles? What is the order of radioactive disintegration process? Derive the relationship between half-life and decay constant.
- 19. Discuss the band gap theory of solids. Also, explain how this band gap is modified in case of semiconductors. How does the conductivity of solids vary with temperature?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.