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Total No. of Pages : 03

Total No. of Questions : 11

M.Sc CHEMISTRY (2018 Batch) (Sem.-2)

INORGANIC CHEMISTRY-II

Subject Code : CHL-411-18

M.Code : 75981

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 EIGHT questions carrying FIVE marks each and students have to attempt any SIX questions.**
3. **SECTION-C will comprise of two compulsory questions with internal choice in both these questions. Each question carries TEN marks.**

SECTION-A

1. a) d^8 square planar complexes are stable although they do not obey 18 electron rule, explain.

   b) Give the valence electron counts for the following species. Which one obeys the 18 electron rule?

   $$[(\eta^7\text{–}C_7H_7)Mo(CO)_3]^+, [H_2Fe(CO)_4]$$

   c) Comment on the role of pi bonding in determining the geometry of the product formed during acid hydrolysis of octahedral complexes.

   d) Discuss the types of intermediates formed in S_N1, S_N2 and $S_N1(CB)$ mechanism.

   e) Write a short note on Zintle ions.

   f) What are hetropolyanions. Give their examples.

   g) Give the mechanism of hydrolysis under basic conditions.

   h) Explain half life period of a radioactive substance.

i) What are the uses of radioactive isotopes?

j) Discuss the Uranium series of radioactivity.

SECTION-B

2. Starting from ferrocene, how will you prepare its

   a) Dicarboxylic derivative

   b) Acetyl derivative

   c) Amine derivative

   d) Bromo derivative

   e) Iodo derivative

3. Discuss the structure and bonding of transition metal complexes with cyclobutadiene.

4. Define Trans effect. Discuss its any one thory.

5. Discuss the characteristics points of inner sphere mcchanism, with example.

6. Taking suitable example, discuss the structures of homouclear and heteronuclear cluster.

7. Write equation for each of the following reactions.

   a) Reaction of diborane with ammonia

   b) Reaction of diborane with HC1

   c) Hydrolysis of diborane

   d) Reaction of borane with chlorine

   e) Reduction of diborane with sodium

8. Breifly discuss the Thermal Reactors.

9. One gram of a radioactive ore decays to 0.125g in 200 hours. How much more time will lapse till only 0.1 Og of the ore is left behind?

SECTION-C

10. Write down the methods of preparation, structure and bonding of Zeise's salt.

OR

a) Discuss the mechanism involved in electron transfer reactions. Give suitable examples.

b) Explain on the basis of VBT, the cause of lability and inertness of octahedral complexes.

11. What are borazines? Give their methods of preparation and discuss the bonding and structure in borazines.

OR

Explain the G.M counter method for the detection and measurement of radioactivity.

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.