DZ-003-1012004 Seat No. _____

B. Sc. (Sem. II) (CBCS) (W.E.F. 2016) Examination

April - 2022

Chemistry : C - 201

(Theory) (Old Course)

Faculty Code : 003

Subject Code : 1012004

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) Answer any five of following ten questions.
(2) Each question carry 14 marks.
(3) Figure to the right side indicate full marks.
(4) Write (a), (b), (c), (d) of particular question together.

1 (a) Answer the following questions : **4**

(1) Ionic compound is made up of _____ and anion.

(2) When two atoms share their $\bar{e}_s$ _____ bond forms. (ionic, metallic, co-valent, Van-der-Waa's)

(3) Give definition of co-ordination number.

(4) Bidentate ligand have _____ donor atoms.

(b) Draw BCC structure of C_SCl. **2**

(c) Give the types of ligands and explain any one of them. **3**

(d) Explain magnetic properties of transition elements in detail. **5**

2 (a) Answer the following questions : **4**

(1) Who is known as father of Co-ordination Chemistry ? (Max-Born, Werner, Born Haber)

(2) Define ligand.

(3) What are transition elements ?

(4) Give electronic configuration of SC.

(b) Give IUPAC name of following complex : **2**

(i) $K_2[Ni(CN)_4]$ (ii) $K[MnO_4]$.

(c) Discuss the atomic radius of transition elements. **3**

(d) Explain Born Haber cycle in detail. **5**

3 (a) Answer the following questions : **4**

(1) What is Co-ordination number of NaCl ?

(2) Smallest part of crystal latice which exhibits all properties of ionic solid is _____.

(i) Unit Cell

(ii) Molar Cell

(iii) Normal Cell

(iv) Equivalent Cell

(3) Which is Ziegler-Natta catalyst ?

$(V_2O_5, MnO_2, TiCl_4, CuCl_2)$

(4) Give formula for magnetic momentum μ.

(b) Write the electronic configuration of Cr and Cu. **2**

(c) Give short notes on : Semi conductors. **3**

(d) Describe Geometrical isomerism in 4-co-ordinated complex compound. **5**

4 (a) Answer the following questions : **4**

(1) What is IUPAC name of $\square$?

(2) The smallest cyclo alkane is _____.

(3) Give two examples of o/p-directors group.

(4) Give structure of Naphthalene.

(b) Give classical of Bicyclic compound. **2**

(c) Explain sulphonation of Benzene. **3**

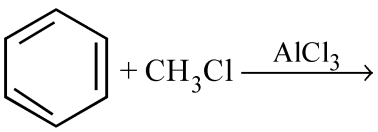
(d) Explain Friedel-Craft alkylation reaction with mechanism. **5**

5 (a) Answer the following questions : **4**

(1) Give structure of cyclo hexane.

(2) What is conformations ?

(3) Complete the reaction :



(4) What is sigma complex ?

(b) Give structural and IUPAC name of Toluene and Aniline. **2**

(c) Explain type of strain. **3**

(d) Explain conformational analysis of n-butane. **5**

6 (a) Answer the following questions : **4**

(1) Give name of  .

(2) Give structure of 1, 1 - dimethyl cyclopentane.

(3) Give two examples of meta directors group.

(4) Complete the reaction :

$$\text{Benzene} + Br_2 \xrightarrow[FeBr_3]{\Delta}$$

(b) Give nitration reaction of benzene. **2**

(c) Explain Huckel rule. **3**

(d) Describe Baeyer-Strain theory. **5**

7 (a) Answer the following questions : **4**

(1) Give two examples of amorphous compound.

(2) Define : Crystal latice.

(3) Give equation of pH.

(4) pH of the pure water is _____.

(b) Give two differences between crystalline and amorphous compound. **2**

(c) Give short note on : Ionic product of water. **3**

(d) Derive value of dissociation constant Ka and Kb and relation between Ka-Kb. **5**

8 (a) Answer the following questions : **4**

(1) What is Miller indices ?

(2) Define : Isotropic.

(3) Define : Buffer solution.

(4) CH_3COONa is a salt of _____ acid and _____ base. (Strong, Weak)

(b) Explain types of electrolytes. **2**

(c) Explain rotating crystal method. **3**

(d) Explain buffer solutions with mechanism. **5**

9 (a) Answer the following questions : **4**

(1) NaCl is known as _____ salt.

(2) Give two examples of crystalline solids.

(3) Give 2 example of salt of strong acid and strong base.

(4) What will be KSp for.

$$AgCl_{(S)} \rightleftarrows Ag^{+}_{(aq)} + Cl^{-}_{(aq)}$$

(b) Give short note on any one law of crystallography. **2**

(c) Give short note on Miller indices. **3**

(d) Describe Bragg's X-ray diffraction method. **5**

10 (a) Answer the following questions : **4**

(1) Draw the structure of Bicyclo [3, 3, 0] octane.

(2) Define aromatic electrophillic substitution.

(3) Cds and Zno has _____ crystal system. (Cubic, Hexagonal)

(4) Give two examples of alloys.

(b) Give name, symbol and atomic number of first transition elements. **2**

(c) Explain Frenkel defect. **3**

(d) Explain Geometrical isomerism in 6-coordinated complex compounds. **5**
