647510 **0301202C1010** **Seat No :_____**

B.Sc. Semester - 2 (*CBCS*) Examination
March/April - 2024 (As Per Syllabus Year-2016)
CHEMISTRY (CORE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1(A) Answer the following question. (04)

(1) What is p-type conductor?
(2) Define: unit cell.
(3) Which type of complex show fac-mer isomerism?
(4) Define: Coordination number.

Que.1(B) Answer any one question. (02)

(1) Explain schottky defects in crystal lattice.
(2) Write a note on π-acid ligand.

Que.1(C) Answer any one question. (03)

(1) Write note on chelate ligands.
(2) Show the derivation of the r^+/r^- value for square planer lattice.

Que.1(D) Answer any one question. (05)

(1) Derive Max-Born equation for the calculation of lattice energy.
(2) Explain Werner's theory.

Que.2(A) Answer the following question. (04)

(1) Which of Cr^+ or Cu^+ is expected to be colored?
(2) Give the use of iron and zinc.
(3) Calculate the number of atoms per FCC unit cell.
(4) Give examples of amorphous substances.

Que.2(B) Answer any one question. (02)

(1) Write the electronic configuration of Cr and Cu.
(2) Write note on Metallic solid.

Que.2(C) Answer any one question. (03)

(1) Discuss the trend in an ionization potential of first transition series.
(2) Explain Intercept law of Miller with figures of (d_{100}, d_{110}, d_{111}).

Que.2(D) Answer any one question. (05)

(1) Write note on catalytic properties of first transition series element.
(2) Discuss the internal structure of NaCl by X-ray diffraction data.

Que.3(A) Answer the following question. (04)

(1) Give the general formula when cyclic alkane contains two ring system.
(2) Give one example of spiro compound with IUPAC name.
(3) Define the conformational analysis.
(4) Define: cyclic compound.

Que.3(B) Answer any one question. (02)

(1) Give conformation of propane.
(2) Explain chemical properties of cycloalkane.

Que.3(C) Answer any one question. (03)

(1) Give conformation of Ethane
(2) Explain addition reaction of cycloalkane.

Que.3(D) Answer any one question. (05)

(1) Explain Baeyer's Strain theory and its limitations.

(2) Explain conformations of n- Butane.

Que.4(A) Answer the following question. (04)

(1) Make a list of electron donating groups.

(2) Define: Electrophilic aromatic substitution reaction.

(3) Which reagents are used for sulphonation of benzene.

(4) Give any two examples of aromatic compound.

Que.4(B) Answer any one question. (02)

(1) Explain aromaticity of cyclopentadienyl ions.

(2) Write all criteria for a compound to be aromatic.

Que.4(C) Answer any one question. (03)

(1) Explain aromaticity of [4] annulene and [6] annulene.

(2) Explain nitration of benzene with mechanism.

Que.4(D) Answer any one question. (05)

(1) Explain orientation based on sigma complex stability when attached group is +I and +R.

(2) Discuss Friedel-Crafts Acylation of benzene with mechanism.

Que.5(A) Answer the following question. (04)

(1) Define: Salt hydrolysis.

(2) Define: Acidic solution.

(3) Why the aqueous solution of Na_2SO_4 is neutral?

(4) Define; Weak electrolytes

Que.5(B) Answer any one question. (02)

(1) Describe the degree of Dissociation of weak base.

(2) Describe the ionic product of water.

Que.5(C) Answer any one question. (03)

(1) Describe the degree of hydrolysis.

(2) Describe the dissociation constant of weak acid.

Que.5(D) Answer any one question. (05)

(1) Write the application of solubility and solubility product.

(2) Describe the common ion effect.

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