647510 **BSCinoCC5010** **Seat No :_____**

B.Sc. Semester - 5 (*CBCS*) Examination
December - 2020 (Old Course)
INORGANIC AND INDUSTRIAL CHEMISTRY(CORE)

Time: 1:30 Hours **Marks: 42**

Instructions:

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Que-1 (a) Answer the following question. (04)

(1) Discuss splitting of d – orbitals in tetrahedral field.

(b) Answer any two questions out of three. (10)

(1) Discuss factors affecting splitting energy Δ.

(2) Give electron configuration of d^1 to d^{10} systems in weak and strong ligand field. Calculate CFSE for d^4,d^5,d^6 and d^7 in both fields.

(3) Discuss about quenching of orbital angular momentum in 3d-model comperes.

Que-2 (a) Answer the following question. (04)

(1) Explain effective atomic number rule.

(b) Answer any two questions out of three (10)

(1) Define metal carbonys and describe its chemical properties.

(2) Define metal nitrosyls and discuss about compounds containing N^{O+} group.

(3) Discuss the application of IR spectroscopy in detection of structure of metal carbonys.

Que-3 (a) Answer the following question. (04)

(1) Explain commutative property and commutator of operator with example.

(b) Answer any two questions out of three. (04)

(1) Derive normalized wave function for a particle moving in one dimensional box.

(2) Describe physical and chemical properties of glass.

(3) Explain briefly : (1) Borosilicate glass, (2) lead glass and (3) Glass wool.

Que-4 (a) Answer the following question. (04)

(1) Discuss about the types of cement.

(b) Answer any two questions out of three (10)

(1) Explain setting and hardening of Portland cement with chemical conversions.

(2) Discuss the properties of cement.

(3) Describe manufacturing of cement with flow chart diagram.

Que-5 (a) Answer the following question. (04)

(1) Discuss manufacturing process of calcium cyanamide by electro carbonate method.

(b) Answer any two questions out of three (10)

(1) What is phosphate fertilizer? Discuss manufacturing of triple super phosphate with flow chart diagram.

(2) Discuss about plant nutrients and its role.

(3) Give manufacturing process of Urea from Ammonium carbamate and give its action as fertilizer.

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