647510 **BSc5CheC501x** **Seat No :_____**

B.Sc. Semester - 5 (*CBCS*) Examination
December -2020 (NEW 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.

Q. 1 (A) Answer the following question. **(4)**

(1) Write note on Degeneracy.

Q.1 (B) Answer the following questions. (Any two) **(10)**

(1) Draw the full structure of $Fe_2(CO)_9$, $Fe_3(CO)_{12}$, $Mn_2(CO)_{10}$, $Ir_4(CO)_{12}$, $Co_2(CO)_8$

(2) Explain normalization & orthogonality of wave function of the particle in one dimensional box.

(3) Calculate EAN and 18 electron for $Fe_2(CO)_9$, $Mn_2(CO)_{10}$

Q. 2 (A) Answer the following question. **(4)**

(1) Explain burning process in manufacture of cement with figure.

Q. 2 (B) Answer the following questions. (Any two) **(10)**

(1) Explain Sindri Process for the production of Ammonium Sulphate.

(2) Discuss different types of cement.

(3) Discuss manufacturing of normal super phosphate by Den process with flow diagram.

Q. 3 (A) Answer the following question. **(4)**

(1) Differentiate High spin and Low spin complex with example.

Q. 3 (B) Answer the following questions. (Any two) **(10)**

(1) Discuss splitting of d – orbitals in octahedral field with CFSE.

(2) Explain raw materials for manufacturing of glass.

(3) Discuss manufacturing of cotton seed oil by Expression method.

Q. 4 (A) Answer the following question. **(4)**

(1) Explain wet process and dry process for manufacture of cement.

Q. 4 (B) Answer the following questions. (Any two) **(10)**

(1) Explain types of NO in metal nitrosyl.

(2) Explain roll of micro nutrients in plant growth.

(3) Discuss factors affecting the crystal field splitting energy.

Q. 5 (A) Answer the following question. **(4)**

(1) Write note on Iodine value.

Q. 5 (B) Answer the following questions. (Any two) **(10)**

(1) Derive wave and energy equation for a particle moving in three dimensional box.

(2) Discuss setting and hardening of Portland cement with chemical reactions.

(3) Calculate CFSE in Kcal/mol for $[Co(CN)_6]^{-3}$ where, splitting energy & pairing energy are 34,800 cm-1 & 19,000 cm-1 respectively.

****