

B.Sc. Semester - 6 (CBCS) Examination

April/May-2022 (NEW COURSE)

Inorganic and Industrial Chemistry (Core (New))

Time: 2:30 Hours

Marks: 70

Instructions:

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

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- Q. 1 (A) Answer the following question. (4)**
Calculate Microstates for (1) $4F$ and (2) $5G$
- Q. 1 (B) Answer the following questions. (Any two) (10)**
(1) Find term symbols for (a) $[\text{Co}(\text{H}_2\text{O})_6]^{+3}$ (b) $[\text{Cr}(\text{H}_2\text{O})_6]^{+3}$
(2) Explain Guoy's balance method with its limitations.
(3) Explain:- Effect of temperature on paramagnetic, ferromagnetic and antiferromagnetic substances.
- Q. 2 (A) Answer the following question. (4)**
Explain any one method for manufacture of anionic detergents.
- Q. 2 (B) Answer the following questions. (Any two) (10)**
(1) Explain: photochemical smog.
(2) Explain: types of soap.
(3) Explain: CFC and ozone depletion.
- Q. 3 (A) Answer the following question. (4)**
Draw the full Orgel diagram of F-term splitting.
- Q. 3 (B) Answer the following questions. (Any two) (10)**
(1) What is Jahn Teller effect? Explain tetragonal distortion in octahedral complexes.
(2) Explain: Ziegler-Natta catalyst with suitable example.
(3) Explain: Free radical polymerization.
- Q. 4 (A) Answer the following question. (4)**
Explain splitting of spectral terms in P^2 case with energy diagram
- Q. 4 (B) Answer the following questions. (Any two) (10)**
(1) Determine allowed term symbol for d^2 case with stability order.
(2) Derive the equation for diamagnetic moment.
(3) Give the name of methods for manufacturing of soap and explain batch process in detail.
- Q. 5 (A) Answer the following question. (4)**
Discuss the absorption spectrum of $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$.
- Q. 5 (B) Answer the following questions. (Any two) (10)**
(1) Discuss the Orgel diagram for d^2 and d^8 system in tetrahedral and octahedral ligand field.
(2) Give the synthesis, properties & use of (a) Bakelite and (b) Nylon-6,6.
(3) Explain Green house effect.
