

B.Sc. Semester - 6 (CBCS) Examination

March/April-2024 (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. (04)**
Calculate Microstates for (1) $4f$ and (2) $5d$
- Q. 1 (B) Answer the following questions. (Any two) (10)**
(1) Find term symbols for (a) $[\text{Fe}(\text{H}_2\text{O})_6]^{+2}$ (b) $[\text{Cr}(\text{Cl})_6]^{-3}$
(2) Explain:- Effect of temperature on paramagnetic, ferromagnetic and antiferromagnetic substances.
(3) Derive the equation for diamagnetic moment.
- Q. 2 (A) Answer the following question. (04)**
Explain: Alcolac Process for manufacture of anionic detergents.
- Q. 2 (B) Answer the following questions. (Any two) (10)**
(1) Explain: Continuous process of soap manufacturing.
(2) Explain in detail: COD
(3) Explain: photochemical smog.
- Q. 3 (A) Answer the following question. (04)**
Draw the full Orgel diagram of F-term splitting.
- Q. 3 (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) Explain: Ziegler-Natta catalyst with suitable example.
(3) Give the synthesis, properties & uses of (i) PHBV & (2) Nylon-6
- Q. 4 (A) Answer the following question. (04)**
Calculate Microstates for (a) $[\text{V}(\text{H}_2\text{O})_6]^{+2}$ (b) $[\text{Fe}(\text{F})_6]^{-4}$
- Q. 4 (B) Answer the following questions. (Any two) (10)**
(1) Explain: Energy splitting diagram for p^2 orbital.
(2) Explain: Types of Soaps.
(3) What is Jahn Teller effect? Explain tetragonal distortion in octahedral complexes.
- Q. 5 (A) Answer the following question. (04)**
Discuss the absorption spectrum of $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$.
- Q. 5 (B) Answer the following questions. (Any two) (10)**
(1) Explain Guoy's balance method with its limitations.
(2) Explain: CFC and ozone depletion.
(3) Give the synthesis, properties & use of (a) Melamine Formaldehyde and (b) Dacron.
