

M.Sc.(Chem.) Semester - 2 (CBCS) Examination**May/June-2021 (NEW COURSE)****Inorganic Chemistry (CORE)****Time: 1:30 Hours****Marks: 42****Instructions:**

1. Figure to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any three of the following questions.
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- Que-1(a) Answer the following:** (04)
(A) Discuss L-S coupling
(B) Find out the spectral term of the following
(1) Cu^{++} (2) Cr^{+++}
- Que-1(b) Answer the following (Any Two)** (10)
(A) Evaluate the Magnetic Moment for Multiple width small compare to kT
(B) Derive Van Vleck formula for magnetic Susceptibility
(C) Discuss the stereo chemical applications and magnetic properties of Lanthanide and Actinide series
- Que-2(a) Answer the following:** (04)
(A) Why $\text{B}(\text{CH}_3)_3$ is an organometallic compound but $\text{B}(\text{OCH}_3)_3$ is not?
(B) Explain 18 Electron rule
- Que-2(b) Answer the following (Any Two).** (10)
(A) Give the difference between Homogeneous and heterogeneous catalysis
(B) Write note on Hydrogenation reaction
(C) Write note on reductive elimination reaction
- Que-3(a) Answer the following:** (04)
(A) Define heme and globin
(B) Draw the structure of Porphyrin.
- Que-3(b) Answer the following (Any Two).** (10)
(A) Define Metalloporphyrines and discuss the structure of hemoglobin and explain its function as an oxygen carriers.
(B) Discuss the role of bulk metal in biological process
(C) Explain the work of cytochromes as electron carriers
- Que-4(a) Answer the following:** (04)
(A) Draw the structure of Borazene
(B) Name any two types of Phosphazenes.
- Que-4(b) Answer the following (Any Two).** (14)
(A) Describe the method of synthesis of Borezene
(B) Discuss the properties and uses of Phosphazenes
(C) Write note on general characteristics of Silicones.
- Que-5(a) Answer the following:** (04)
(A) Define Nano materials
(B) Write a note on Quantum dots
- Que-5(b) Answer the following (Any Two).** (14)
(A) How Nano catalyst property can be tailored?
(B) Write short note on Basic Synthesis pathways of Nanomaterials.
(C) Explain SEM or TEM in detail.
