



ST-301001 Seat No. _____
M. Sc. (Sem. I) Examination
February - 2021
MSC0C101 : Inorganic Chemistry

Time : 2 Hours]

[Total Marks : 50

- Instructions :** (1) Answer only **three (3)** questions.
(2) The examination will be for **two (2)** hours.
(3) Question No. **9** is **compulsory** and carries **14** marks.
(4) Answer any **two** questions from questions No. **1** to **8**. Each question carries **18** marks.

1 Answer the followings

- (1) Discuss the Variation method.
- (2) For simple Harmonic Oscillator, Prove that $E = 1/2 ka^2$.

2 Answer the followings

- (1) State perturbation principle . Give its application to the Helium, atom.
- (2) For first order perturbation, Find out the values for correction to the energy and wave function.

3 Answer the followings

- (1) State and explain five important rules about irreducible representations and their characters.
- (2) Find out the direct product for
(i) $T_2 \times T_1$ (ii) $E \times T_1$ in T_d .

4 Answer the followings

- (1) What is character table? Explain its different compartments.
- (2) For a point with Co-ordinate X,Y,Z show the matrix for symmetry operation S_n .

5 Answer the followings

- (1) Explain the pascal's constant and its utility.
- (2) Explain the term ferromagnetism and anti-ferromagnetism.
Distinguish between the properties of the compounds exhibiting such phenomenon.

6 Answer the followings

- (1) What are magnetically dilute substance?

Explain: Super exchange interaction and intermolecular antiferromagnetism.

- (2) Discuss curie and curie-weiss law.

7 Answer the followings

- (1) Discuss the function of iron in biological system.

- (2) Write a note on hemoglobin and myoglobin.

8 Answer the followings

- (1) Discuss 'In-Vitro' nitrogen fixation.

- (2) Discuss the use of co-ordination compounds in medicine.

9 Answer the followings

- ✓ (1) Define: Linear operator.

- ✓ (2) Write the equation of energy of the HMO.

- ✓ (3) What is the application of commutator relationship?

- ✓ (4) Define: Character.

- (5) When is Kronecker delta equals zero?

- ✓ (6) Write the definition of "Neel Temperature".

- ✓ (7) What is the structure of ATP?

- (8) Define: Metalloporphyrin's.

- (9) Calculate if $5X^3$ is the eigen function of d^2/dx^2 operator or not.

- (10) How do we designate all one-dimensional representation in

character table?

- (11) Define 'Permeability'.

- (12) What is heam and heamin?

- (13) What is polycythemia?

(14) write the biological function of corium