Roll No. .....

(05/16-I)

5253

B. Sc. EXAMINATION

(Sixth Semester)

CHEMISTRY

Paper XIX CH-305

Physical Chemistry

Time : Three Hours *Maximum Marks :* 26

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory. Attempt any *two* questions from each of Sections A and B.

1. (a) Define 'Parity' with example.

   (b) Define Quantum Efficiency.

   (c) What is Photo Sensitizer ?

   (d) What are Colligative Properties ?

   (e) Define Triple Point.

   (f) Define Meta-stable Equilibrium. 1×6=6

Section A

2. (a) Explain Franc Condon principle briefly.

   (b) Explain the different possible electronic transitions in between σ, π, n and π^* orbitals. 2+3=5

3. (a) Differentiate between Fluorescence and Phosphorescence.

   (b) What is Beer's Law ? What are its limitations ? 2+3=5

4. (a) Draw Jablonski diagram depicting various processes occurring in the excited state.

   (b) What do you understand by intersystem crossing ? 3+2=5

Section B

5. (a) Derive a relation between depression in freezing point and molality of a solute in a dilute solution.

   (b) Discuss in detail the method for

6. (a) A solution containing 10 g sodium chloride in one litre water freezes at –0.604°C. Calculate effective percentage ionizing of NaCl if molal depression constant of water is 1.86°C m^{-1}.

   (b) Draw phase diagram for sulphur system. 3+2=5

7. (a) Draw phase diagram for Lead-Silver system and illustrate the principle of Pattinson's process for enrichment of silver (Desilverisation of lead).

   (b) What do you understand by degree of freedom ? Explain with example. 3+2=5