Roll No. .....

5253

B. Sc. EXAMINATION

(Sixth Semester)

CHEMISTRY

Physical Chemistry

Paper XIX

CH-305

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) Give term symbol for O_2^+.

   (b) Define the law of photochemical equivalence.

   (c) Define molal extinction coefficient.

   (d) Define activity.

(e) What is eutectic point ?

(f) Define congruent melting point.

Section A 1×6=6

2. (a) Discuss the selection rules for transitions in electronic spectroscopy of molecules.

(b) Explain the following terms : 2+3=5

(i) Spin multiplicity

(ii) Parity

(iii) Intensity of electronic band.

3. (a) Determine the transmittance, absorbance and molar absorbance coefficient of a solution which transmits 40% of a particular monochromatic light when passed through a 2 cm thick vessel containing 0.05 M solution.

(b) Explain photo sensitization with a suitable example. 3+2+=5

4. (a) Differentiate between thermochemical and photochemical processes.

(b) Explain, why there is a large difference between quantum yields of photochemical formation of HCl and HBr ? 2+3=5

Section B

5. (a) Why do we observe abnormal molecular masses of solute in certain cases when determined by studying colligative properties ? Explain with example.

   (b) Give thermodynamic derivation of the relation between molecular mass and depression in freezing point. 2+3=5

6. (a) Define Rault's law and derive Rault's law for a solution having non-volatile solute.

   (b) Explain the terms true equilibrium and meta-stable equilibrium. 3+2=5

7. (a) Draw phase diagram for water system.

   (b) Explain the cooling curve method for plotting the phase diagrams. What are its limitations ? 2+3=5