

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.

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- (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.

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- (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 Raoult's law and derive Raoult'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