

CS/2051

Paper - V  
C-Physical Chemistry  
Sem - VI

5814/MH

Max. Marks : 26 Marks

Min. Pass Marks : 35%

Max. Time : 3 hrs

Candidates are required to attempt two questions (4 marks each) selecting each from section A & B. Section C is compulsory (2 marks each question).

**SECTION - A**

- (a) Discuss polarizability concept and using this concept, explain which type of molecules will be raman active and raman inactive?  
(b) Derive an expression for pure rotational Raman spectra?
- (a) Discuss Franck-Condon principle in detail?  
(b) Discuss selection rules for electronic spectra to take place?
- Draw well labelled Jablonski diagram and discuss various processes involved in it?
- Write a note on
  - Photosensitisation
  - Quantum yield?

**SECTION - B**

- (a) Discuss laws of crystallography?  
(b) Discuss Laws of symmetry and Laws of constancy of interfacial angles?
- How is Bragg's law useful in the determination of crystal structure by X-ray diffraction technique?
- Determine the structure of CsCl in detail?
- (a) What do you mean by proper and improper rotation in Crystallography?  
(b) Discuss and find Miller indices for the intercept (2a, 3b, 2c) made by plane?

**SECTION - C**

- (a) What are strokes, antistrokes and Rayleigh lines? Which will be more intense and Why?  
(b) Discuss bonding and antibonding molecular orbitals on the basis of potential energy curves?  
(c) Discuss various laws of photochemistry?  
(d) Differentiate between crystalline and amorphous solid?  
(e) Define space lattice and unit cell?