



**SB-3435**

**M. Sc. (Part - I) Examination**

**March / April – 2011**

**Chemistry : Paper - IV**

*(Physical Chemistry)*

Time : 3 Hours]

[Total Marks :54

**Instructions :**

(1)

नीचे दृशावेक निशानीवाणी विगतो उत्तरवही पर अवश्य लभवी. Fillup strictly the details of signs on your answer book.		Seat No. :	
Name of the Examination :		<input type="text"/>	
M. SC. (PART - I)		<input type="text"/>	
Name of the Subject :		<input type="text"/>	
CHEMISTRY : PAPER - IV (PHYSICAL CHEMISTRY)		<input type="text"/>	
Subject Code No. :		Section No. (1, 2,.....) :	
3 4 3 5		1&2	
		Student's Signature	

(2) Attempt two sections in separate answer books.

(3) Figures to the **right** indicate full marks.

**SECTION – I**

- 1 (a) Define and classify liquid crystals. 3  
(b) Give salient properties in liquid crystals. 3  
(c) Write important applications of liquid crystals. 3

**OR**

- 1 (a) Write a note on lyotropic liquid crystals. 3  
(b) Describe smectic liquid crystals. 3  
(c) Explain lyotropic mesomorphism. 3

- 2 (a) Explain band theory of electronic structure of solids. 3  
(b) Derive relation of viscosity of gases and mean free path. 3  
(c) Derive Dieterici equation of state. 3

**OR**

- 2 (a) Define collision frequency and derive equation for binary collisions. 3
- (b) Give an account on insulators and semi-conductors with respect to band theory. 3
- (c) Write a short note on Fullerenes. 3
- 3 (a) Distinguish between static and dynamic light scattering. 3
- (b) Explain acid - base equilibria in amino acids. 3
- (c) Describe any diffraction technique. 3

**OR**

- 3 (a) Write a note on biomembrane. 3
- (b) Explain the hydrolysis of ATP and give its importance. 3
- (c) Explain scattering. Describe any scattering technique. 3

### SECTION – II

- 4 (a) Explain dropping mercury electrode and its advantages. 3
- (b) Explain Debye-Huckel-Onsager equation. 3
- (c) Discuss the relaxation and electrophoretic effect in strong electrolyte solutions. 3

**OR**

- 4 (a) Write a note on Debye-Falkenhagen effect. 3
- (b) Define diffusion current and explain factors affecting it. 3
- (c) Explain the standard addition method for the quantitative analysis used in D.C. polarography. 3
- 5 (a) Describe various units of radiation energy. 3
- (b) Write a short note on Flash photolysis method. 3
- (c) Explain stellar energy. 3

**OR**

- 5 (a) Explain thermonuclear reactions on earth. 3  
(b) Describe the theoretical principle of relaxation method. 3  
(c) Describe Breeder reactor. 3
- 6 (a) Write a note on Langmuir film balance to study insoluble monolayers. 3  
(b) Discuss adsorption from solution. 3  
(c) Describe Enzyme catalysis. 3

**OR**

- 6 (a) Define the terms : carrier, promoter, inhibitor and position in catalysis. 3  
(b) Explain the mechanism of heterogeneous catalysis. 3  
(c) Explain phase change from pressure area curve. 3

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