

**SECTION - IV**

8. (a) Give applications of liquid crystals. 2, 3, 3  
(b) Find parachor values of H in decane ( $C_{10}H_{22}$ ).  
Given:  $[P]_{CH_2} = 39.0$ ;  $[P]_{C_{10}H_{22}} = 424.2$ .
- (c) Explain the following:  
(i) Rheochor  
(ii) Surface tension
9. (a) Write a note on liquid crystals. 4, 2, 2  
(b) Give differences in between solid, liquid and liquid crystals.  
(c) Explain the different types of intermolecular forces.

Roll No. ....

**91034**

**B. Sc. (Hons.) Chemistry 1st semester  
Examination - December, 2015  
CHEMISTRY (PHYSICAL CHEMISTRY)**

Paper : P - II

Time : Three Hours ] [ Maximum Marks : 40

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note:** Attempt five questions in all question No. 1 is compulsory. Attempt any four questions selecting one from each Section. All questions carry equal marks.

1. (a) What is the formula of Freundlich adsorption equation.  $1 \times 8 = 8$   
(b) Which primitive unit cell has :  
 $a = b \neq c$  and  $\alpha = \beta = \gamma = 90^\circ$ .  
(c) Define physical adsorption.

- (d) Define Liquids.  
 (e) Define enzymes.  
 (f) What is primitive unit cell?  
 (g) Define Adsorption isobar.  
 (h) What is Boyle's temperature.

#### SECTION - I

2. (a) The reduced volume, reduced temperature of a gas are 10.2 and 0.7. What will be its pressure if its critical pressure is 42 atm. 2, 3, 3  
 (b) Derive a relation for Boyle's temperature using Vander-waal equation.  
 (c) Explain the following:

- (i) Liquefaction of gases  
 (ii) Andrew's Experiment

3. (a) To prove that  $P_c V_c = \frac{3}{8} RT_c$ . 4, 2, 2

- (b) What is the significance of vanderwaal constant 'a' and 'b'.

- (c) Give the differences in between ideal gases and real gases.

#### SECTION - II

4. (a) Explain the effect of increase of temperature on : 6, 2

- (i) Physical adsorption

- (ii) Chemical adsorption  
 (iii) Mean free path  
 (iv) Most probable speed  
 (b) Give differences in between physical and chemical adsorption.  
 5. (a) Explain the following : 6, 2

- (i) Maxwell's probability distribution curve

- (ii) Factors affecting mean free path

- (b) Explain the application of BET equation.

#### SECTION - III

6. (a) A face makes intercepts  $\frac{3}{2a}$ ,  $\frac{4}{3b}$ ,  $\frac{5}{3c}$  on the X, Y, Z-axes respectively. What are the Miller indices of the face. 3, 3, 2

- (b) Explain the application of Gibb's adsorption equation.

- (c) Explain the application of adsorption.

7. (a) Explain the edge length, axial angles of seven basic unit cell. 3, 2, 3

- (b) Explain Law of constancy of interfacial angles.

- (c) Derive Michaelis-Menten equation.