

Roll No. : .....

Total No. of Questions : 9 ] [ Total No. of Pages : 4

**91034**

B.Sc. (Chemistry Hons.) 1st Semester  
(Full & Reappear)  
Examination, March-2021  
(w.e.f. 2012-13)

PHYSICAL CHEMISTRY  
Paper-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, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) Calculate the various degree of freedom for  $\text{CO}_2$  molecule.

- (b) What is Compressibility Factor ?  
(c) Define root mean square velocity.  
(d) Give one example each for absorption and adsorption.  
(e) What is Space Lattice ?  
(f) Name the instrument used for measuring interfacial angles in crystal.  
(g) Define Coefficient of Viscosity.  
(h) How does evaporation helps in cooling ?

1×8=8

**Section-A**

2. (a) Describe the following :  
(i) Graham's law of diffusion  
(ii) Critical constants  
(b) Derive van der Waals equation of state for real gases. 4,4
3. (a) State and explain principle of equipartition of energy.  
(b) Derive reduced equation of state.  
(c) Write a note on liquification of gases. 4,2,2

Section-B

4. (a) Explain the following :  
(i) Viscosity of gases  
(ii) Collision frequency  
(b) What is mean free path ? Derive an expression for it. 4,4
5. (a) Explain the following :  
(i) Adsorption isobars  
(ii) Physical adsorption  
(iii) Chemical adsorption  
(b) Explain and compare Langmuir and Freundlich adsorption isotherms. 3,5

Section-C

6. (a) Differentiate between Crystalline and Amorphous solids.  
(b) Explain the following :  
(i) Axis of symmetry  
(ii) Mechanism of enzyme catalysis  
(iii) Law of rational indices 2,6

7. (a) Describe Bravais lattices.  
(b) Derive Gibbs adsorption equation. 4,4

Section-D

8. (a) What is surface tension and surface energy? How surface tension varies with temperature ?  
(b) Explain liquid crystal and its types. 4,4
9. Describe the following :  
(i) Rheochor  
(ii) Parachor  
(iii) Thermography  
(iv) Vapour pressure 8