TB145160B **Reg. No.....**

Name.....

B. Sc. DEGREE (C.B.C.S.S.) EXAMINATION, APRIL 2017
Supplementary – 2014 Admission
SEMESTER V - CORE COURSE (CHEMISTRY)
CHE5SM - STATES OF MATTER

Time: Three Hours **Maximum Marks: 60**

PART A

I. Answer all questions. Each question carries 1 mark.

1. What is space lattice?
2. Give an example of a crystal showing Frenkel defect
3. What is the coordination number of an fcc unit cell?
4. The point group to which CH_3Cl belong ----------
5. Define critical temperature.
6. Unit of van der Waal's constants are ----------
7. Name two surfactants.
8. What is Virial equation of state?

(8x1=8)

PART B

II. Answer any six questions. Each question carries 2 marks.

9. Find d_{100}, d_{110} and d_{111} for a simple cubic system and also find their ratio.
10. What is Freundlich adsorption isotherm?
11. Define the law of rational indices.
12. What is Bragg's equation?. Explain the terms involved.
13. Calculate the miller indices of a crystal plane which cut the crystal axes at (2a, -3b, -3c).
14. Explain about the Bravais lattices of a cubic system.
15. Water wets the glass surface but mercury does not. Why?
16. How can you say that viscosity of a liquid changes with the change in temperature?
17. Write the relationship between root mean square velocity, average velocity and most probable velocity.
18. What is collision frequency?

(6x2 = 12)

PART C

III. Answer any four qustions. Each question carries 4 marks.

19. What is the effect of temperature on the Maxwell's distribution of molecular velocities?
20. Discuss the Linde's method for the liquefaction of gases.
21. The time of flow of water through Ostwald Viscometer is 1.48 minutes. For the same volume of a liquid of density 0.72 gm/ml,it is 2.42minutes. Find the viscosity of the liquid relative to that of water and also absolute viscosity at 20^oC. Density and viscosity of water at 20^oC are 0.975gm/ml and 10.02 millipoise respectively.

22. Explain Bragg's rotating crystal method for the determination of crystal structure.
23. Write a note on a) Packing fraction b) Coordination number
24. Write a short mote on superconductivity.

(4x4= 16)

PART D

IV. Answer any two questions. Each question carries 12 marks.

25. What are the types of imperfections found in crystals? Explain.
26. Discuss briefly Langmuir theory of adsorption. Derive an expression for Langmuir unimolecular adsorption isotherm.
27. Write a short note on the following
    a) Explain AB and ABC type packing in crystals.
    b) Discuss about the PV isotherms of CO_2.
28. Under what conditions gases deviate from ideal gas laws?. Derive Van der Waals equation.Give a brief description about the deviation of real gases from ideal behavior at different temperature and pressure.

(2x12 = 24)