c) What is the Kinetic particle theory of gases, liquids and solids?

d) What is Elevation of boiling point? Explain its experimental determination and applications.

OR

Discuss in detail imperfections in solid.

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Total No. of Questions :5] *[Total No. of Printed Pages :4*

Roll No .....

PY - 104

B. Pharm. I Semester

Examination, December 2016

Pharmaceutical Chemistry - I

(Physical)

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What are Homo nuclear molecules and Hetero nuclear molecules?

b) What do you mean by HOMO and LUMO?

c) Explain energy level diagram for molecular orbitals.

d) Discuss the shapes of the following molecules using the VSEPR model

i) PCl_5 ii) XeF_2

iii) $\overset{\oplus}{H_3O}$ iv) $\overset{\oplus}{CH_3}$

OR

Write the important conditions required for the linear combination of atomic orbitals to form molecular orbitals.

2. a) Which out of NH_3 and NF_3 has higher dipole moment and why?

b) What is the relation between enthalpy of reaction and enthalpies of formation?

c) Justify Hess's Law of constant heat summation with suitable examples.

d) Explain the Gibb's free energy change and under what conditions will the reaction be spontaneous.

OR

Discuss in detail variation of ΔG and K with temperature.

3. a) What are the important characteristics of chemical equilibrium?

b) What is the difference between order of reaction and molecularity?

c) What are the factors influencing the rate of chemical reaction? Explain.

d) Discuss in detail Le Chatelier's principle and Arrhenius equation. Write a short note on significance of activation energy.

OR

Discuss in detail factors affecting the chemical equilibrium and explain how acid-base catalysis decompose the medicinal compounds.

4. a) Explain Clausius-Clapeyron equations.

b) Distinguish between adsorption and absorption with an example.

c) Can physisorption and chemisorption occur simultaneously? Explain .

d) What is the Shape selective catalysis? How it is carried out? Explain Nernst distribution law.

OR

Explain in detail Freundlich and Langmuir adsorption isotherms. Discuss in detail pharmaceutical application of catalysis.

5. a) What is the relationship between the volume and the pressure of a gas when the temperature is held constant.

b) State Boyle's law. Give its mathematical expression and graphical representation.