

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**B. Pharm. – SEMESTER II • EXAMINATION – WINTER 2015**

**Subject Code: 2220002**

**Date: 15/12/2015**

**Subject Name: Pharmaceutical Chemistry-II (Physical Chemistry)**

**Time: 2.30 pm to 5.30 pm**

**Total Marks: 80**

**Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) Describe different methods to determine the order of reaction in brief. **06**
  - (b) Define order of reaction and molecularity. Explain difference between molecularity of the reaction and order of the reaction **05**
  - (c) The half life of a substance in a first order reaction is 258 seconds. How long it will take for the reaction to be completed 75%? **05**
- Q.2**
- (a) Explain the collision theory with its limitations. **06**
  - (b) Define following (Any five) **05**
    - 1) Chemical kinetics. 2) Pseudo order reaction. 3) Half life of reaction
    - 4) Activation energy. 5) Rate of reaction 6) Homogeneous catalyst
  - (c) In a first order reaction, the concentration of reactant decrease from 0.06 to 0.04 litre<sup>-1</sup> and this requires 45 minutes, what will be the half life period of this reaction ? **05**
- Q.3**
- (a) Define quantum efficiency. Explain in detail causes of high & low quantum yield with examples. **06**
  - (b) Draw Jablonski diagram. State and explain Lambert- Beer law of Photochemistry **05**
  - (c) Define following (Any five) **05**
    - 1) Chemiluminescence 2) Fluorescence. 3) Photochemistry
    - 4) Phosphorescence. 5) Thermopile 6) Adiabatic process
- Q.4**
- (a) Define adsorption isotherm. Write a note on Langmuir adsorption isotherm. **06**
  - (b) Compare physical adsorption and chemisorption. Describe applications of adsorption. **05**
  - (c) Define Joule-Thomson coefficient. Write a note on Joule-Thomson effect. **05**
- Q.5**
- (a) Explain the phase diagram of one component and three phase system. **06**
  - (b) Define Thermodynamics and explain first law of thermodynamics. **05**
  - (c) Define enthalpy. How enthalpy of a chemical reaction can be calculated? **05**
- Q. 6**
- (a) Explain in brief i) Colligative properties ii) Partition co-efficient. **06**
  - (b) Discuss Debye-Huckel theory in detail **05**
  - (c) Define molarity, molality, normality. Explain Henry's law in short. **05**
- Q. 7**
- (a) Enlist methods employed for determination of surface tension. Explain any two in detail. **06**
  - (b) Write a note on Parachlor. **05**
  - (c) Define following (Any five) **05**
    - 1) Viscosity 2) Refractive index. 3) Molar refraction 4) Vapour Pressure
    - 5) Optical activity 6) Specific rotation 7) Boiling Point

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