

# GUJARAT TECHNOLOGICAL UNIVERSITY

B. Pharmacy Sem-II Examination June 2010

Subject code: 220003

Date: 17 / 06 / 2010

Subject Name: Pharm Chemistry-II

Time: 02.30 pm – 05.30 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) | Define the term 'Viscosity Coefficient'. Describe Ostwald's viscometer method for determining it. | 05 |
| (b) | Define: Parachor. Explain its applications in elucidating structure.                              | 07 |
| (c) | Define: Molar Refraction. Describe Abbe Refractometer.  | 04 |

### Q.2

- |     |   |    |
|-----|---|----|
| (a) | State and explain Henry's Law. Enlist its limitations.                                  | 06 |
| (b) | Derive a relation for the depression of freezing point of a solution with its molality. | 04 |
| (c) | What is conductance ? Discuss Debye-Huckel theory.                                      | 06 |

### Q.3

- |     |   |    |
|-----|---|----|
| (a) | State first law of thermodynamics. Derive the equation $C_p - C_v = R$            | 04 |
| (b) | Write a note on 'The Carnot Cycle'.   | 05 |
| (c) | Explain phase rule with the meaning of the terms involved in it.                  | 05 |
| (d) | Explain the following:<br>1) Entropy                      2) Joule-Thomson effect | 02 |

### Q.4

- |     |  |    |
|-----|--|----|
| (a) | What is an adsorption isotherm ? Discuss, in detail, Langmuir adsorption isotherm. | 07 |
| (b) | Differentiate between physical adsorption and chemisorption.                       | 03 |
| (c) | Explain the any four characteristics of enzyme catalysis.                          | 06 |

### Q.5

- |     |  |    |
|-----|--|----|
| (a) | State & explain Lambert- Beer law of Photochemistry.   | 04 |
| (b) | Define Quantum efficiency. Discuss causes of high quantum yield with suitable examples.              | 05 |
| (c) | Explain Jablonski diagram.   | 04 |
| (d) | Explain the following:<br>1) Fluorescence              2) Phosphorescence              3) Thermopile | 03 |

**Q. 6**

- (a) Enlist various methods for determination of order of reaction. **08**  
Discuss any two methods.
- (b) The reaction between methane and diatomic sulphur is given by the **04**  
following equation:  
$$\text{CH}_{4(g)} + 2\text{S}_{2(g)} \rightarrow \text{CS}_{2(g)}$$
  
The rate constant for this reaction at 550 C and 625 C temperatures  
is  $1.1 \text{ lit.mol}^{-1}$  and  $6.4 \text{ lit.mol}^{-1}$  respectively. Calculate  $E_a$  for the  
reaction. (  $R = 8.3145 \text{ J. K}^{-1} . \text{mol}^{-1}$  )
- (c) What is order of reaction ? Derive integrated rate equation for first **04**  
order reaction.

**Q.7**

- (a) Define: Radioactivity. Enlist methods for measurement of **07**  
radioactivity. Discuss any one in detail.
- (b) Compare properties of  $\alpha$ ,  $\beta$ , and  $\gamma$  radiations. **03**
- (c) The heat of combustion of ethanol is -330.0 kcal. If the heat of **04**  
formation of  $\text{CO}_{2(g)}$  and  $\text{H}_2\text{O}_{(l)}$  be -94.3 kcal and -68.5 kcal  
respectively, calculate the heat of formation of ethanol.
- (d) Why are high molecularity reactions rare ? – Explain. **02**

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