Exam. Code: 0906
Sub. Code: 33293

2015

B.E. (Bio-Technology), Second Semester

ASC-X01: Applied Chemistry

(Common with CSE, IT & Civil)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

1. (a) Give two methods by which geometrical isomers can be distinguished?

(b) Why crystal field splitting in the case of tetrahedral complexes is less than octahedral complexes?

(c) Under what conditions, heat of reaction at constant volume and constant pressure becomes equal?

(d) What is homogenous catalysis? Give one example.

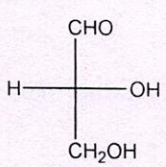
(e) Why π-π^* electronic transitions are more intense than n-π^* transitions? (5x2)

UNIT - I

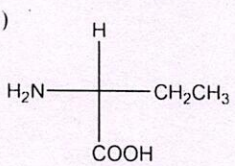
2. (a) Draw various conformations of cyclohexane and represent them on potential energy diagram. **3**

(b) Assign R and S configuration to the following Fischer projections; **4**

(i)



(ii)



(c) Define enantiomers, diastereomers and meso compound with one example in each case. **3**

3. (a) Explain the crystal field splitting in the case of tetrahedral complexes. **4**

(b) Calculate CFSE in the following complexes; **6**

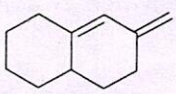
i) $[Ni\ Cl_4]^{2-}$ ii) $[Fe\ (CN)_6]^{3-}$ $[Co\ (NH_3)_6]^{3+}$

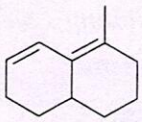
P.T.O.

4. (a) What are selection rules in UV spectroscopy? **2**

(b) Discuss the various types of infrared regions that are ranging in between wavenumber 400-4000cm^{-1}. **4**

(c) Calculate λ_{max} for the following compounds using Woodward-Fieser rules; **4**

i) 

ii) 

UNIT - II

5. (a) Derive expressions for w, q, ΔE and ΔH when an ideal gas undergoes i) isothermal reversible expansion ii) isothermal irreversible expansion. **6**

(b) Calculate the amount of heat supplied to the Carnot's cycle working between 368 K and 288 K if the maximum work obtained is 895 jouls. **4**

6. (a) Show that for enzyme catalyzed reaction, $V_o = V_{max}$ [S]/ Km + [S] **5**

(b) Explain in detail the mechanism for the synthesis of acetic acid from methanol using Monsanto process. **5**

7. (a) Explain the mechanism of cationic and anionic polymerization by taking suitable example. **7**

(b) What is crystallinity in polymers? What are the factors that affect the crystallinity in polymers? **3**

x-x-x