Exam.Code:0905
Sub. Code: 33243

2125

B.E., First Semester

ASC-X01: Applied Chemistry

(Common with CSE, ECE, MEC, EEE, IT and 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 Section.

x-x-x

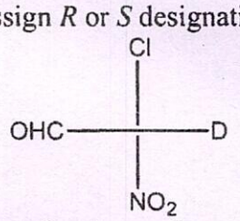
Q.1. (a) Explain the limitations of valence bond theory.
(b) Differentiate between enantiomers and diastereomers.
(c) Define Lambert-Beer's law.
(d) Explain second and third law of thermodynamics.
(e) Give the significance of Michealis Menten equations. **(5×2=10)**

Section-A

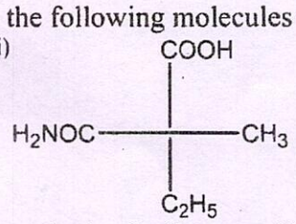
Q.2. (a) Explain bonding in N_2 molecule on the basis of molecular orbital theory.
(b) With suitable example, describe crystal field splitting in octahedral complexes. **(4, 6)**

Q.3. (a) Assign *R* or *S* designation to the following molecules with explanation:

i)

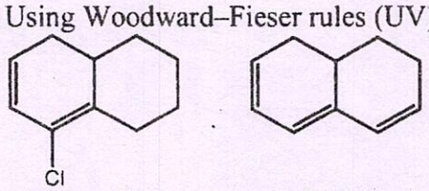


ii)



(b) Describe the conformational analysis of *n*-butane with energy profile diagram.
(c) With suitable example, explain Newman projection. **(3, 5, 2)**

Q.4. (a) Using Woodward–Fieser rules (UV), calculate λ_{max} for the following compounds:



(b) List the different types of electronic transitions in Ultraviolet (UV) absorption spectroscopy.
(c) How will you differentiate between C_2H_5OH and CH_3OCH_3 using infrared spectroscopy?
(3, 4, 3)

Section-B

Q.5. (a) Describe reversible isothermal expansion of an ideal gas.
(b) Illustrate the criteria's for the spontaneity of a reaction. **(5, 5)**

Q.6. (a) Differentiate between homogeneous and heterogeneous catalysis.
(b) What is Wilkinson's catalyst? Elaborate the mechanistic steps involved in hydrogenation of alkene using it. **(4, 6)**

Q.7. (a) Discuss the mechanism of condensation polymerization with suitable example.
(b) Explain the properties and uses of polyester & phenol-formaldehyde resin. **(5, 5)**

x-x-x