JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

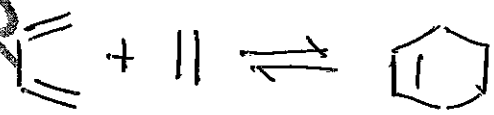
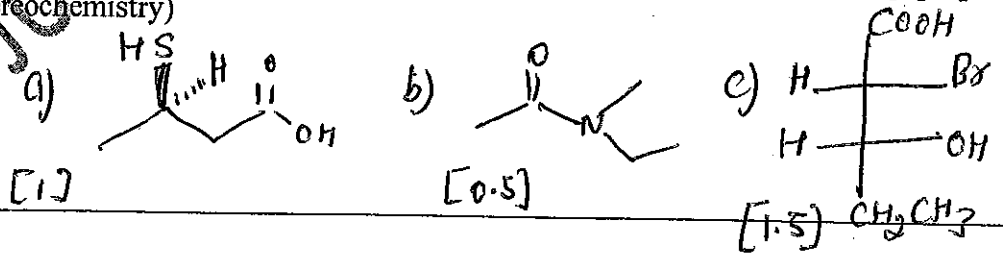
COURSE CODE (CREDITS): 25B11CE314 (3) MAX. MARKS: 25

COURSE NAME: CHEMISTRY

COURSE INSTRUCTORS: Dr. GOPAL SINGH BISHT MAX. TIME: 1 Hour 30 Minutes

Note: Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	a) The specific rotation of L-alanine in water (25°C) is +2.8. A student prepared a mixture of L-alanine and its enantiomer and 7 gm of the mixture was dissolved in 20 mL of water. The solution was then placed in a sample cell with pathlength of 10 cm. and observed optical rotation is +0.8. Calculate % ee of mixture. b) A solution of ethanol in water is 15% by volume. If the solution and pure ethanol have densities of 0.9066g/cc and 0.785 g/cc respectively. Find % of ethanol by weight. c) A weak acid has a pK_a of 7.07. If the pH of the solution is 7.38, what percentage of the acid is undissociated? d) A sample of water contains 6.585×10^{20} atoms. How much water (in mol) is present? e) 200 gm of HCl solution of relative density 1.17 contains 66.8 gm of HCl. What volume of this HCl solution will be required to exactly neutralize 5 L of 0.1 N NaOH.	COI	[2] [2] [2] [1] [2]
Q2	Design an experiment to determine whether a given nucleophilic substitution reaction follows an S_N1 or S_N2 mechanism. Assess the steps, variables to control, and the expected outcomes that would indicate the mechanism.	COII	[5]
Q3	Consider the following reactions. Predict whether an increase in temp will favor reactant or product. Justify your prediction 	COII	[3]
c	a) If the compounds undergoes elimination reactions, explain possibility of preferred mechanism and justify your answer. b) Explain Miller indices with suitable example.	COII	[3] [2]
Q5	Give IUPAC names to following organic compound (with assigning proper stereochemistry)  [1] [0.5] [1.5]	COII	[3]

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