KATHMANDU UNIVERSITY
End Semester Examination
January/February, 2025

Level : B.Pharm.
Year : I
Time : 2 hrs. 30mins.

04 FEB 2025

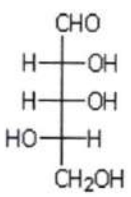
Course : CHEM 203
Semester : II
F. M. : 55

SECTION "B"
[55 marks]

Attempt ALL questions.

1. Give the mechanism for the following reactions. [5 ×2 = 10]
   a. Polymerization of styrene in presence of peroxide
   b. Synthesis of CH_3CH_2COOH staring with malonic ester
   c. Thermal cyclization of butadiene
   d. 2 CH_3COCH_3 in presence of aqueous NaOH
   e. $H_3C—C\equiv CMgBr + CH_3CHO$

2. Explain the following statements (***ANY FIVE***). [5 × 2 = 10]
   a. Electrophilic substitution in pyridine occurs less easily than in benzene.
   b. (+) Sucrose is non-reducing sugar.
   c. [2+2] Cycloaddition reactions occur readily in photochemical condition.
   d. Structure of polymers can be explained by considering entropy and enthalpy.
   e. Kiliani-Fischer synthesis generates epimers.
   f. Enzymatic action of α chymotrypsin is pH dependent.

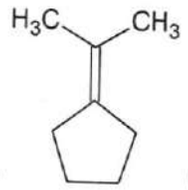
3. Give the chemical reactions involved in the following processes ***(ANY SIX)***. [6 × 2 = 12]
   a.  + H_2/Ni followed by acetylation
   b. Conversion of aldopentose to aldotetrose
   c. Preparation of amino acid by phthalimidomalonic ester method
   d. Boc (*tert.* Butyloxycarbonyl) anhydride with methyl amine followed by HBr in acetic acid
   e. Lauryl alcohol with H_2SO_4 followed by aqueous NaOH
   f. Cationic and anionic polymerization
   g. 2 $CH_3CH_2COOC_2H_5$ in presence of C_2H_5OH/NaOH

4.
   a. What happens when pyridine is treated with H_2/Pt? Compare the basicity between double and triple bonded compounds. [2]

P.T.O.

b. Discuss the acidity of α hydrogen in CH_3-CO-CH_2-$COOC_2H_5$. What type of reactions is favored by it? [2]

c. Considering Wittig reaction, how can you prepare the following two compounds? [2]



(i) (ii) Ph-CH=CH-PH

d. 2-Ketohexose reacts with HCN to give A which on hydrolysis gives B. The reaction of B with HI/heat yields C. Identify A, B and C showing necessary chemical equations. [2]

e. Write down the chemistry of phospholipid mentioning its role in cell membrane. [2]

f. How can the chain length of amylose be determined? [3]

OR

How can you prove that [1,3] sigmatropic shift of hydrogen is not common but [1,5] occurs? Show it with the help of detailed reactions.

5. Write short notes on (***ANY FOUR***). [4 × 2.5 = 10]

a. Synthesis of peptides
b. Chemistry and quality of soap
c. Cycloaddition reactions
d. Coordination polymerization
e. Nucleophilic substitution in pyridine