Bachelor of Engineering Chemistry Examination 2024

1st Year, 1st Semester (Supplementary)

CHEMISTRY-III (Organic Chemistry)

*(Use a separate answer script for **CHEMISTRY-III**)*

CO 5

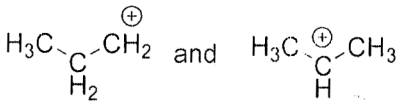
1. Identify the following species as electrophile or nucleophile. 1

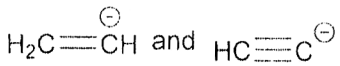
$AlCl_3$ NH_3

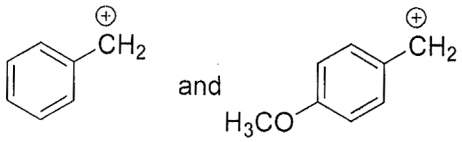
2. Answer **any three** of the following questions: 4x3

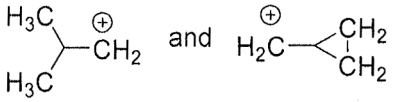
a) Write down the mechanism of bromination of benzene with $Br_2/FeBr_3$ and draw the energy profile diagram for the reaction. 3+1

b) Compare the relative stability of the following pairs of ionic species with proper reasons (**any two**): 2x2

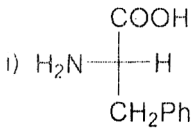
i) 

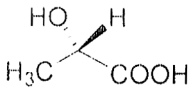
ii) 

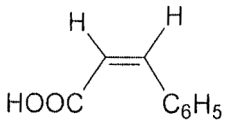
iii) 

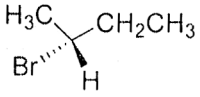
iv) 

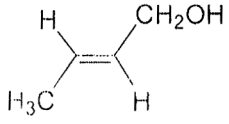
c) Assign *R/S* or *E/Z* (whichever applicable) to the following molecules (**any four**): 1x4

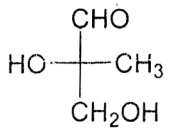
i) 

ii) 

iii) 

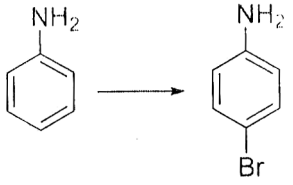
iv) 

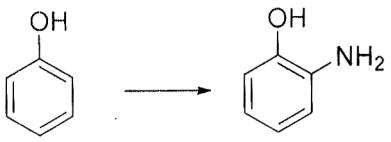
v) 

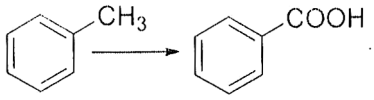
vi) 

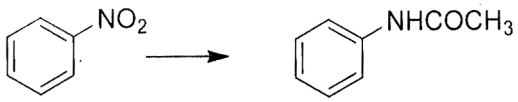
d) Define stereoselective reaction with an example. 4

e) Carry out the following transformations mentioning the reagents/reaction conditions, no mechanism is required (Attempt **any two**). 2x2

i) 

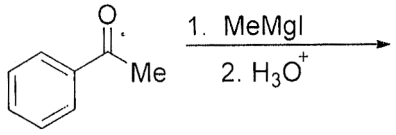
iii) 

ii) 

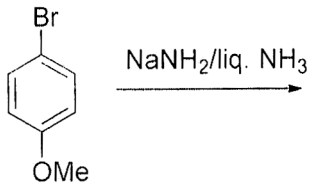
iv) 

f) Predict the product with mechanism (**any two**): 2x2

i) 

iii) 

ii) 

iv) 

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3. Attempt **any three** of the following questions: 4×3

a) What is peptide bond? How can you determine the N-terminal amino acid of a tripeptide by Sanger's method? 4

b) What happens when D-glucose is treated with excess phenyl hydrazine? 4

c) Describe the scheme for the preparation of phenol from benzene via cumene (no mechanism is needed). 4

d) What is rancidity of fat? What is saponification value of a lipid? 2+2

e) Write industrial method of preparation for ***any two*** of the following: 2x2

i) Chloroform ii) Asirin iii) Methyl salicylate iv) Paracetamol