

6. Write short notes on the following name reactions

(Do any **three**):

(i) Benzoin Condensation

(ii) Williamson's Ether Synthesis

(iii) Aldol Condensation

(iv) Wagner-Meerwein Rearrangement (5,5,5)

(1500)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1557

I

Unique Paper Code : 2172511101

Name of the Paper : DSC-A1 (Basic Concepts of Organic Chemistry)

Name of the Course : **B.Sc. Program Physical Sciences**

Semester : I

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions.
3. **All** questions carry equal marks.

P.T.O.

1. (a) What is hyperconjugation effect? Explain the order of stability of primary, secondary and tertiary carbocations on the basis of this effect.

(b) Give the hybridization state and shape of CH_3^- anion.

(c) Arrange the following in increasing order of acidity and justify your answer: Phenol, Benzoic acid, Acetic acid and Ethanol.

(d) What is electromeric effect? Explain with the help of a suitable example.

(e) Distinguish between inductive effect and resonance effect. (Give atleast three points of difference).

(3,3,3,3,3)

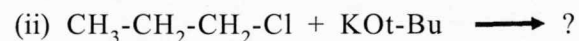
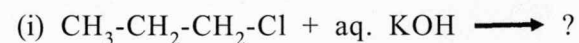
(b) Compare basicity order of primary secondary and tertiary amines in gaseous medium and aqueous medium. Justify the basicity order in each case.

(2,2,2,2,2,3)

5. (a) Draw all possible stereoisomers of tartaric acid and identify which of them are optically active. Also identify the pair of enantiomers and diastereomers among them.

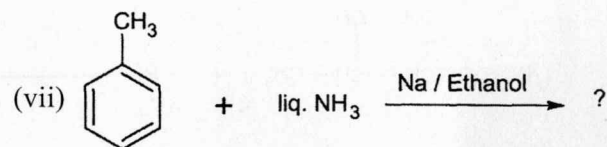
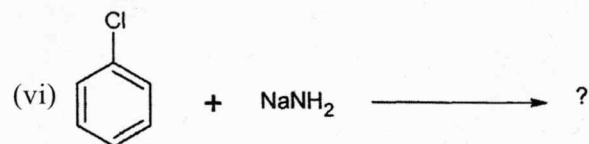
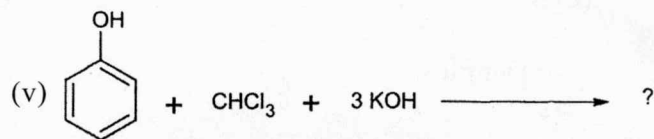
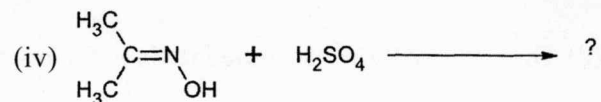
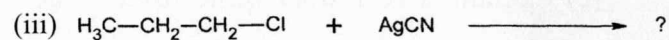
(b) Give the mechanism of Michael addition reaction.

(c) Predict the products and mention the type of reaction mechanism in the following reactions:

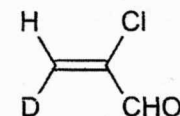
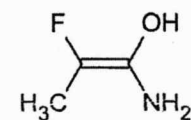


(d) Give the reaction and specify the major product when propene is subjected to hydroboration-oxidation reaction.

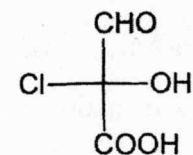
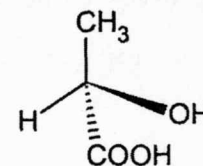
(4,4,4,3)



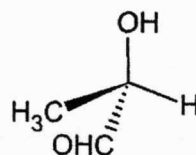
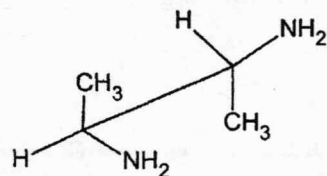
2. (a) Assign the priority sequence and designate E/Z configuration to the following :



- (b) Assign the priority sequence and designate R/S configuration to the following :



- (c) Convert the following projection formulae to Fischer projection :



- (d) Draw energy profile diagram for conformations of n-butane and label the energy gaps between significant conformations. (4,4,4,3)

3. (a) Name a reaction which involves carbene as an intermediate. Give the steps for generation of carbene in this reaction.

- (b) What is Kharasch effect? Explain the stereochemical aspect of this effect. Name the major product obtained when 1-butene is subjected to reaction with HBr in presence of benzoyl peroxide.

- (c) Explain why nitrobenzene directs the incoming electrophile to meta position?

- (d) Give the reaction and mechanism for bromination of phenol.

- (e) What is an ambidentate nucleophile? Give two examples. (3,3,3,3,3)

4. (a) Complete the following reactions (**Do any six**) :

