

QP Code : 78934

(REVISED COURSE)

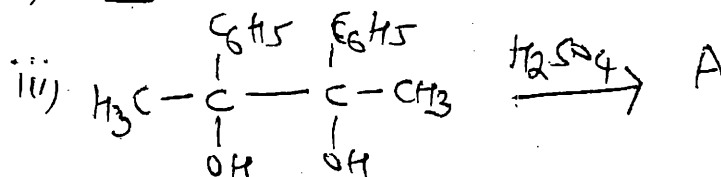
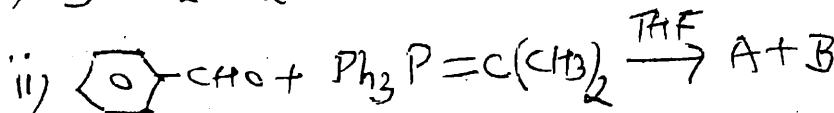
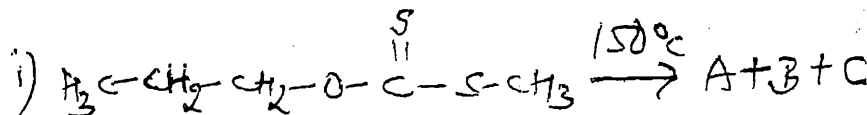
(2½ Hours)

[Total Marks : 75

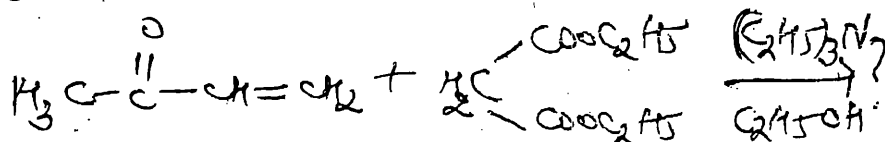
- N. B. : (1) All questions are compulsory.
 (2) Figures to the right indicate full marks.
 (3) Use of logtable/non-programmable calculator is allowed.

1. Answer any three of the following :-

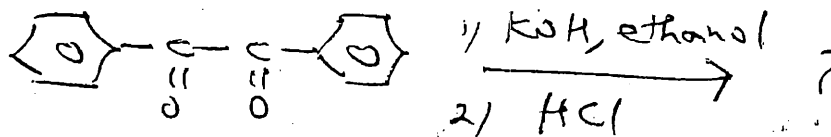
- (A) What is neighbouring group participation effect? Explain its mechanism. Illustrate with a suitable example. 5
 (B) (a) Give the mechanism involved in Favorskii rearrangement. 3
 (b) Explain the term nucleophilicity with relevant examples. 2
 (C) (a) Complete the following reactions. 3



- (b) Explain Hofmann elimination with an example. 2
 (D) Complete the following reaction, name the reaction involved and give a suitable mechanism. 5



- (E) (a) What is E1 reaction? Explain its mechanism. 3
 (b) Discuss the stereochemistry of Beckmann rearrangement. 2
 (F) (a) Suggest a suitable mechanism involved in the following reaction. 3

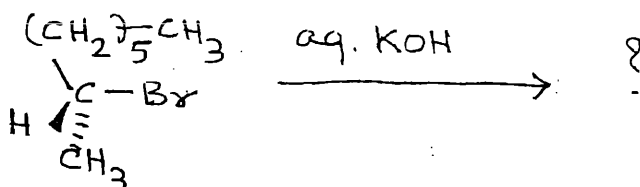


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(b) What is an acyl nucleophilic substitution? Give an example. 2

2. Answer **any three** of the following :-

(A) Complete the following reaction. Explain its S_N2 mechanism and stereochemistry. 5



(B) Draw all the four important conformations of cyclohexane. Which of these is the most stable conformation? Why? 5

(C) Define the following and explain with suitable examples of organic molecules. 5

- (a) Centre of symmetry
(b) Alternating axis of symmetry

(D) Explain the stereochemistry of catalytic hydrogenation of cis and trans isomers of 2,3-diphenyl-2-butene 5

(E) Explain the mechanism of syn-hydroxylation of olefins using potassium permanganate. Also explain the stereochemistry of syn-hydroxylation of trans-2-butenedioic acid 5

(F) Explain molecular chirality of substituted allenes with suitable examples. 5

3. Answer **any three** of the following :-

(A) Give the preparation of 5

- (i) Lithiumdimethyl cuprate
(ii) Phenyl lithium

What is the action of CH_3CN on phenyl lithium?

(B) (a) How are the following compounds prepared using ethylmagnesium bromide? 3

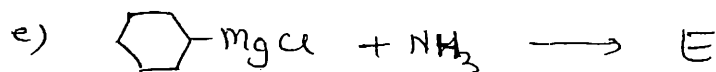
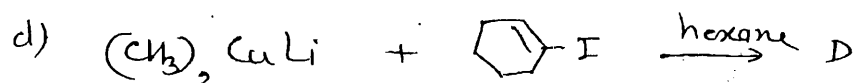
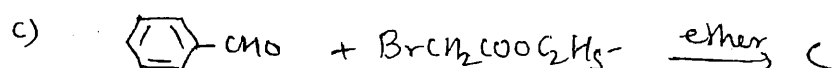
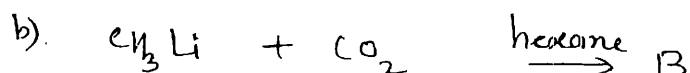
- (i) 1-propanol
(ii) 2-hexanol
(iii) Propanoic acid

(b) Give the reaction of methyl lithium with an epoxide 2

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(C) How is iodomethyl zinc iodide prepared? Discuss mechanism and applications of Simmons-Smith reaction. 5

(D) Complete the following reactions 5



(E) With the help of a neat and labelled Jablonski diagram, explain the phenomenon of fluorescence. Is it an allowed or a forbidden transition? Why? 5

(F) Explain photoreduction of benzophenone to benzpinacol in a stepwise manner. 5

4. Answer **any three** of the following :-

(A) Explain polymer supported polypeptide synthesis 5

(B) Explain the use of the following in Green Chemistry 5

(a) Supercritical CO_2

(b) Deep Eutectic Solvents

(C) Explain the following terms in retrosynthesis 5

(a) Functional Group Addition

(b) Functional Group Interconversion

(D) (a) Define (i) Target molecule 3

(ii) E-factor

(iii) Synthetic Equivalent

(b) Explain atom economy with suitable example. 2

(E) (a) Explain the use of green reagents in organic synthesis with suitable examples. 3

(b) Give the green synthesis of adipic acid. 2

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- (F) Explain the following 5
- (a) Enzymatic catalysts
 - (b) Any three important principles of green chemistry
5. (A) Choose the right answer from the alternatives given below each and rewrite the completed statements 4
- (a) Dehydrohalogenation of bromoethane takes place through _____ mechanism.
(E1, E2, E1 CB)
 - (b) Cope elimination is observed in _____.
(N-substituted amides, aromatic ketoximes, tertiary amine oxides)
 - (c) In the reaction $R-I + \bar{O}H \rightarrow R-OH + \bar{I}$,
 $\bar{O}H$ behaves as _____.
(a base, a nucleophile, an electrophile)
 - (d) The alkaline hydrolysis of an ester is a _____ process
(unimolecular, bimolecular, termolecular)

OR

- (A) State if the following are **true** or **false** 4
- (p) Hofmann rearrangement involves a benzyne intermediate
 - (q) Basicity affects the rate of reaction
 - (r) A transition state cannot be isolated
 - (s) E_2 elimination preferably takes place from the syn-periplanar conformation. 4
- (B) State whether the following are **true** or **false**
- (a) In epoxidation of olefins, a trans-substrate gives a cis-oxirane
 - (b) In syn-hydroxylation of olefins using potassium permanganate, a cis-substrate gives a meso vicinal diol
 - (c) When treated with thionyl chloride, an R-alcohol gives as S-alkyl halide
 - (d) When treated with aq.KOH, an R-alkylhalide (secondary) gives an S-alcohol.

OR

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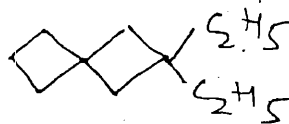
(B) State whether the following molecules are chiral or achiral

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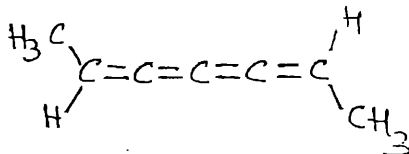
p)



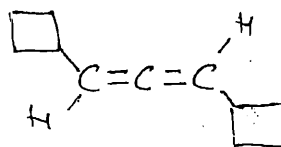
q)



r)



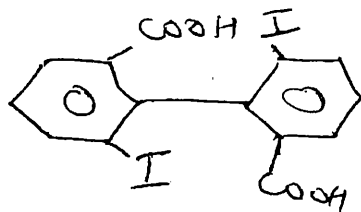
s)



(C) Give I.U.P.A.C. names of the following

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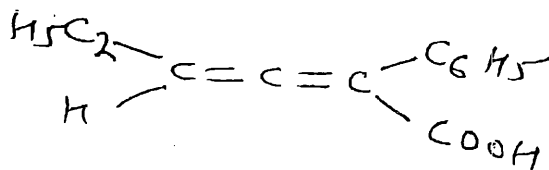
a)



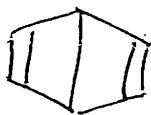
b)



c)



d)



OR

(C) Give the structures of the following

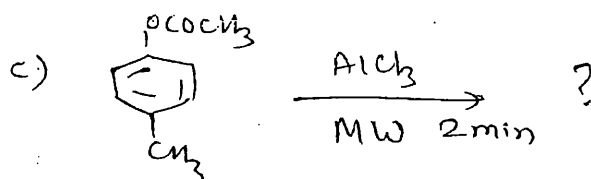
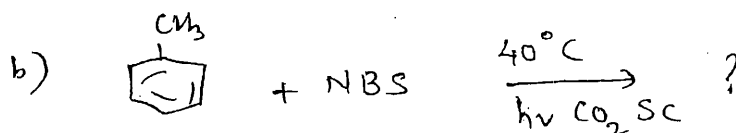
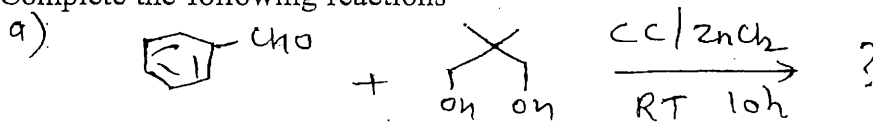
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- (p) 2,4'-Diamino diphenyl
- (q) Bicyclo [3.3.2] dec-2-ene
- (r) 7-Methoxyspiro [4,5] decane
- (s) 1-Chloro-2,3-pentadiene

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(D) Complete the following reactions

3



OR

(D) Match the columns appropriately

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- | | |
|----------------------------------|----------------------|
| (p) Mg(OH) Br | CH ₃ MgBr |
| (q) : $\bar{\text{C}}\text{H}_3$ | Urea + Glycol |
| (r) DES | Green Reagent |
| | Hazardous waste |
| | Green solvent |
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