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.

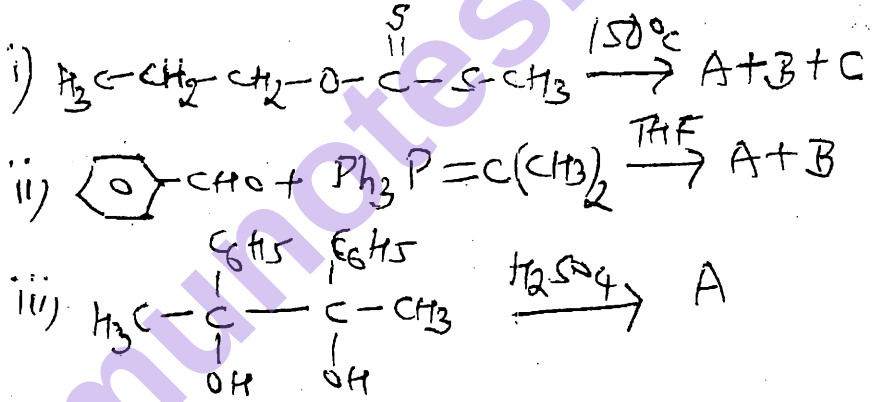
1. Answer **any three** of the following :–

(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**

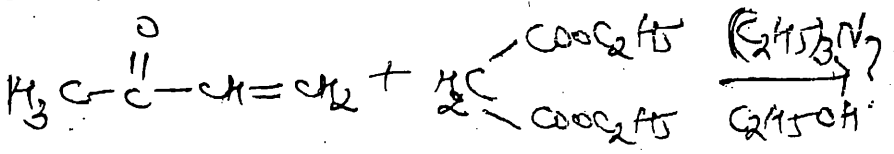
(b) Explain the term nucleophilicity with relevant examples. **2**

(C) (a) Complete the following reactions. **3**



(b) Explain Hofmann elimination with an example. **2**

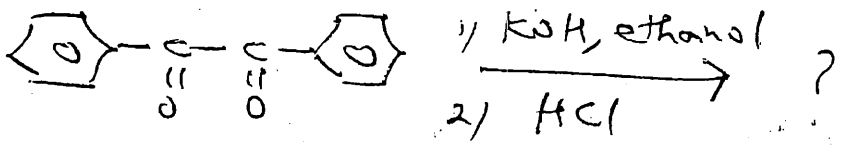
(D) Complete the following reaction, name the reaction involved and give a suitable mechanism. **5**



(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**

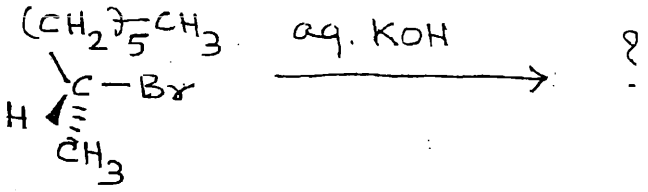


[TURN OVER

(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 catatylic 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 wtih suitable examples. 5

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

(A) Give the preparation of 5

(i) Lithiumdimethyl cuprate

(ii) Phenylithium

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

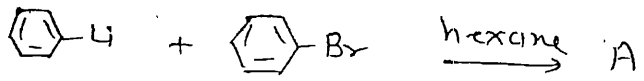
(ii) 2-hexanol

(iii) Propanoic acid

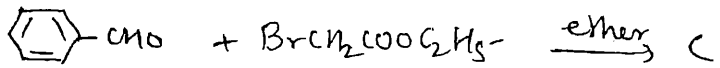
(b) Give the reaction of methyl lithium with an epoxide 2

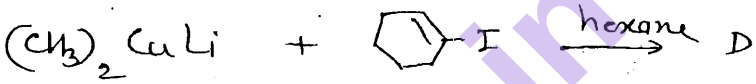
(C) How is iodomethyl zinc iodide prepared? Discuss mechanism and applications of Simmons-Smith reaction. 5

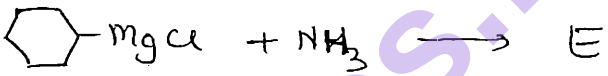
(D) Complete the following reactions 5

a) 

b) 

c) 

d) 

e) 

(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

(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 4

(A) State if the following are **true** or **false**

(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

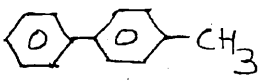
(b) In syn-hydroxylation of olefins using potassium permanganate, a cis-substrate gives a meso vicinal diol

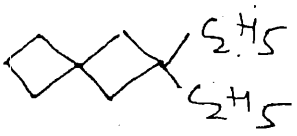
(c) When treated with thionyl chloride, an R-alcohol gives as S-alkyl halide

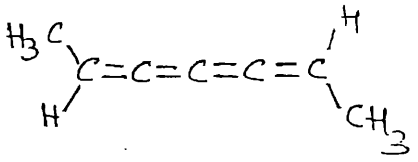
(d) When treated with aq.KOH, an R-alkylhalide (secondary) gives an S-alcohol.

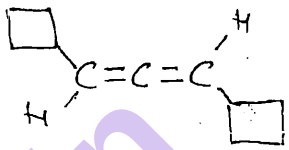
OR

(B) State whether the following molecules are chiral or achiral 4

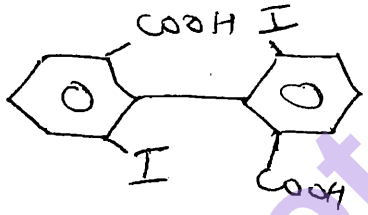
p) 

q) 

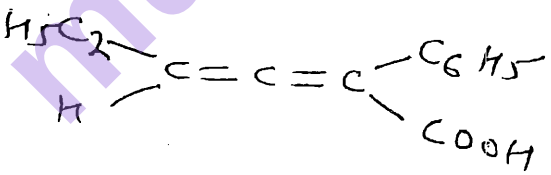
r) 

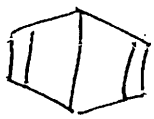
s) 

(C) Give I.U.P.A.C. names of the following 4

a) 

b) 

c) 

d) 

OR

(C) Give the structures of the following 4

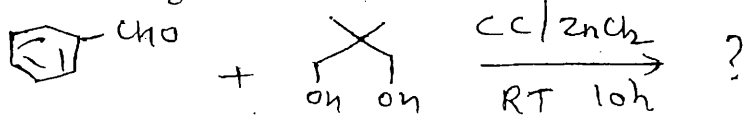
(p) 2,4'-Diamino diphenyl

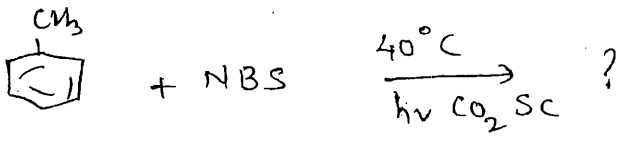
(q) Bicyclo [3.3.2] dec-2-ene

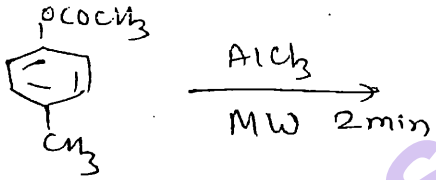
(r) 7-Methoxyspiro [4,5] decane

(s) 1-Chloro-2,3-pentadiene

(D) Complete the following reactions 3

a) 

b) 

c) 

OR

(D) Match the columns appropriately 3

(p) Mg(OH) Br	CH_3MgBr
(q) $:\overline{C}H_3$	Urea + Glycol
(r) DES	Green Reagent
	Hazardous waste
	Green solvent

822C27AFC1FCADEAA4D1E945597148EF