CHEMISTRY

RESONANCE ENGLISH

ORGANIC REACTION MECHANISMS-IV

Exercise-1 Part-1

1. Why dehydration of alcohol takes place in acidic medium generally but not in basic medium

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2. 1° alcohols are poor starting material for synthesis of 1-Alkene. Explain ?

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3. Predict the major product of the acid catalysed dehydration of the following alcohols :

(a)$(CH_3)_2C(OH)CH_2CH_3$, (b)$CH_3CH_2CH_2CH(OH)CH_3$

(c)$(CH_3)_2C(OH)CH(CH_3)_2$, (iv)$(CH_3)_3CCH_2OH$

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4. When 1-Bromo-1-methylcyclohexane is heated in ethanol for an extended period of time, three products result : one ether and two alkenes . Predict the products of this reaction, and propose mechanism for their formation.Also, mention the major elimination product.

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5. An alkyl halide of formula $C_6H_{13}Br$ on treatment with potassium t-butoxide gives two isomeric alkenes dimethy butane. Isomeric alkene are :

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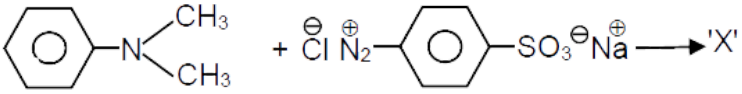
6.  formed product 'X' is used as:

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7. Bromocyclodecane on heating with ethanolic KOH, produces two alkenes. Write the two products also mentions the major one.

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8. Which alkyl chloride would yield following pure alkene on reaction with alcoholic KOH ?

$(i)CH_3 - \overset{CH_3}{\overset{|}{C}} = CH_2 \quad (ii)CH_3 - CH_2 - CH_2 - CH = CH_2 \quad (iii)CH_3$

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9. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and identify the major alkene:

(i) 1-Bromo-1-methylcyclohexane , (ii) 2-Chloro-2-methylbutane

(iii) 2,2,3-Trimethyl-3-bromopentane

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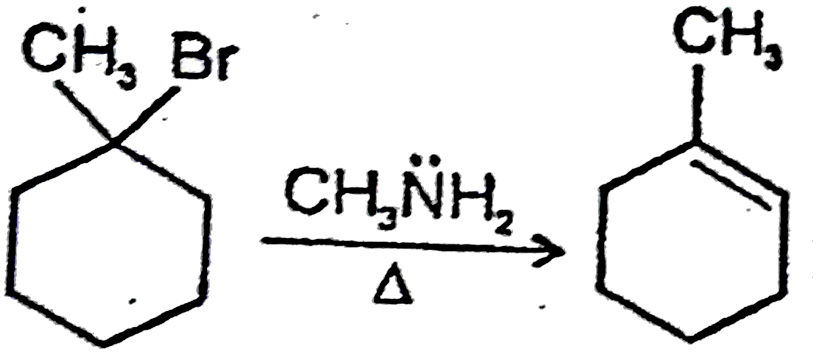
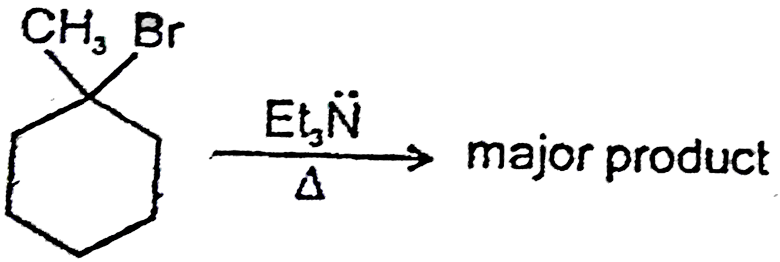
10. If 

, Then what wil be the major product of the following reaction



major

product

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11. What are the essential conditions for any reaction to show E1cB mechanism ?

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12. If ethanol containing EtOD is used as solvent , then deuterium exchange take place in E1cB mechanism . Why ?

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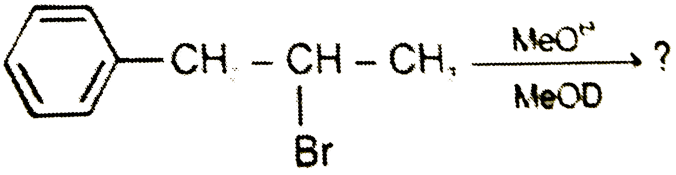
13. If the mechanism is E1cB then the possible products will be :



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Exercise-1 Part-2

1. Which of the following reaction is an example of elimination reaction :

A. $CH_3 - CHO \xrightarrow[H_2O]{CH_3MgBr} CH_3 - \underset{OH}{CH} - CH_3$

B. $CH_3 - \underset{OH}{CH} - CH_3 \xrightarrow[\Delta]{Conc.\,H_2SO_4} CH_3 - CH = CH_2$

C. $CH_3 - CH_2 - OH \xrightarrow{PBr_3} CH_3 - CH_2 - Br$

D. $CH_3 - CH_2 - COOH \xrightarrow{NaNH_2} CH_3 - CH_2 - COONa + NH_3$

Answer: B

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2. Correct statement for E1 Reaction is :

A. It is a two step process.

B. Rearrangement is possible

C. Good leaving group favours

D. All of these

Answer: D

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3. Intermediate formed during E2 reaction is -

A. Carbocation

B. Carbanion

C. Free radical

D. Carbene

Answer: A

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4. $CH_3 - \underset{CH_3}{\underset{|}{C}}H - \underset{Cl}{\underset{|}{CH}} - CH_3 \xrightarrow{EtOH\ /\ \Delta}$ Major elimination product X.

X is :

A. $CH_3 - \overset{CH_3}{\overset{|}{C}}H - CH = CH_3$

B. $CH_3 - \overset{CH_3}{\overset{|}{C}} = CH - CH_3$

C. $CH_3 - \overset{C_2H_5}{\overset{|}{C}} = CH_2$

D. $CH_3 - \overset{CH_3}{\overset{|}{C}} = \overset{CH_3}{\overset{|}{C}} - CH_3$

Answer: B

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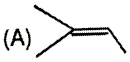
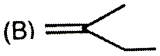
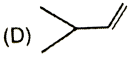
5. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - CH_3 \xrightarrow[\Delta]{Conc.\,H_2SO_4}$ Major product is :

A. 

B. 

C. 

D. 

Answer: A

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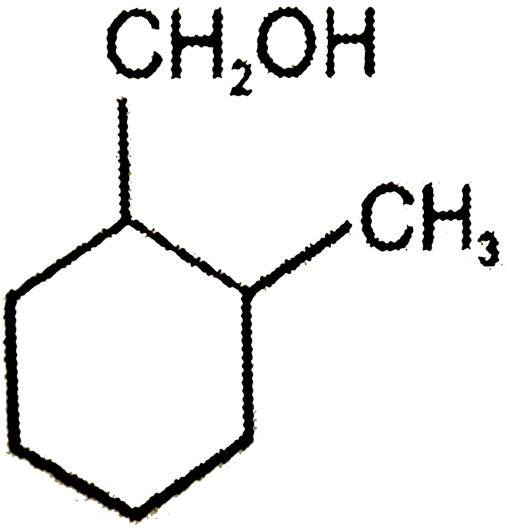
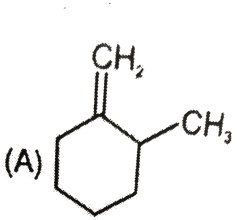
6. In the given reaction :



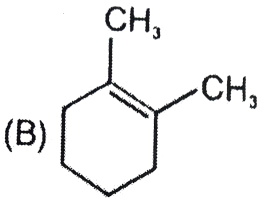
$\xrightarrow{Conc.\,H_2SO_4}$ [X] as major product

[X] will be :

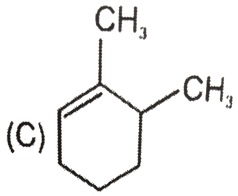
A.



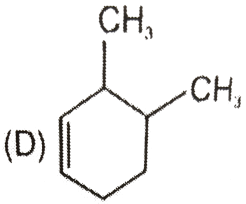
B.



C.



D.



Answer: B

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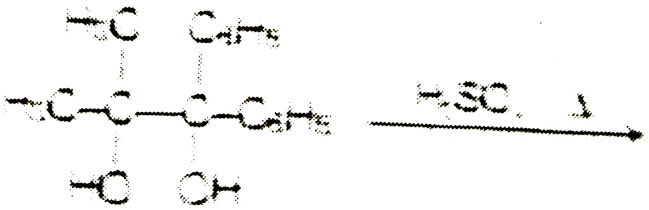
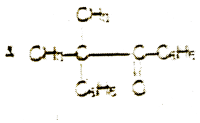
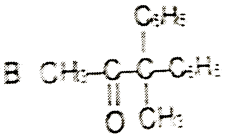
7. Identify the major formed in the following reaction



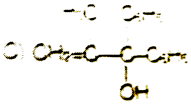
A.



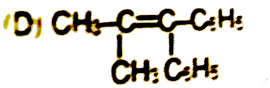
B.



C.



D.



Answer: B

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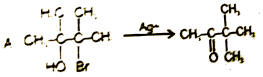
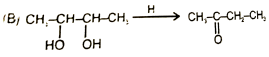
8. Which of the following does not represent the correct product?

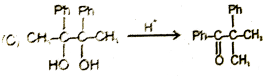
A.

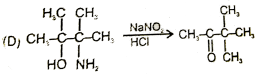


B.



C.



D. 

Answer: C

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9. Correct statement for E1 Reaction is :

A. It is a two step process.

B. It is an unimolecular reaction

C. Strong base favours

D. Carbanion is formed during the reaction

Answer: C

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10. Intermediate formed during E2 reaction is -

A. Carbocation

B. Carbanion

C. Free radical

D. Intermediate is not Formed

Answer: D

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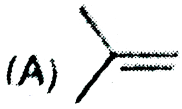
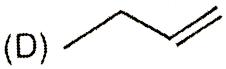
11. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{H}{|}}{C}} - CH_2Br \xrightarrow[\Delta]{AlKOH}$ Alkene,

Alkene is -

A. 

B. 

C. 

D. 

Answer: A

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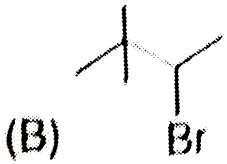
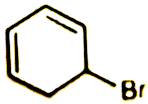
12. Which of the following compounds undergo `E2 reaction with maximum rate?

A. 

B. 

C.

(D) 

D.

Answer: C

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13. 2-Chlorobutane on treatment with alcoholic KOH/Δ gives major product :

A. 2-Butene

B. 1-Butene

C. 2-Butanol

D. 1-Butyne

Answer: A

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14. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - \overset{Cl}{\overset{|}{CH}} - CH_3 \xrightarrow[\Delta]{t-BuO}$ Major Product is :

A. $CH_3 - \underset{CH_3}{\underset{|}{C}} = CH - CH_3$

B. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - CH = CH_2$

C. $CH_2 = \underset{CH_3}{\underset{|}{C}} - CH_2 - CH_3$

D. $CH_3 - \underset{CH_3}{\underset{|}{CH}} - \overset{OH}{\overset{|}{CH}} - CH_3$

Answer: B

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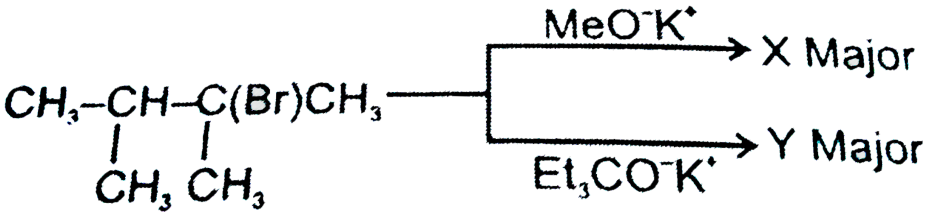
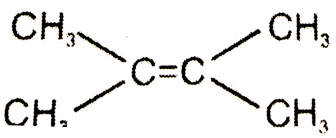
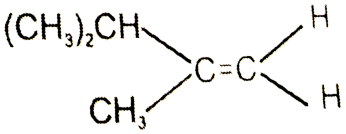
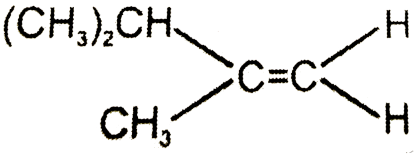
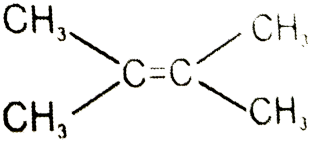
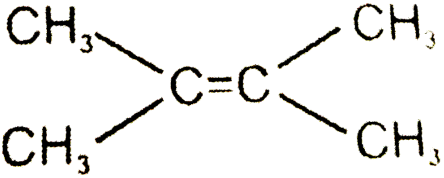
15.

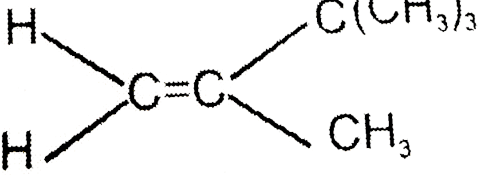


X and Y are respectively :

A. (A)  and 

B. (B)  and 

C. C) Both 

D. (D) Both 

Answer: A

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16. Identify the major products in the following reactions ?

$$CH_3 - CH_2 - \overset{\oplus}{.}\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{N}} - CH_2 - CH_2 - CH_3 \xrightarrow{\overset{\ominus}{OH} / \Delta}$$

A. $CH_3 - CH = CH_2$

B. $CH_2 = CH_2$

C. $CH_3CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{\overset{\oplus}{N}}} - OH$

D. $C_2H_5 - OH$

Answer: B

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17. Reaction intermediate of $E1cB$ reaction is :

A. Carbocation

B. Carbanion

C. Benzyne

D. Free radical

Answer: B

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18. In which compund $D-$ exchange is possible in presence of OD^- / D_2O ?

A. E1

B. E2

C. E1cB

D. none of these

Answer: C

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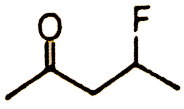
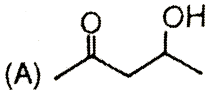
C-3.

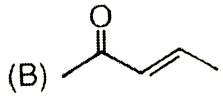


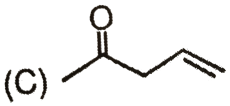
KOH, Δ → Major Product is

19.

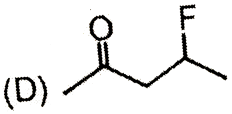
Major Product is :

A. 

B. 



C.



D.

Answer: B

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20. Major product of given reaction is -

$$O_2N - CH_2 - \underset{\underset{Cl}{|}}{CH} - CH_3 \xrightarrow[\Delta]{\overset{\ominus}{OH}} \text{Major product}$$

A. $O_2N - CH = CH - CH_3$

B. $O_2N - CH_2 - CH = CH_2$

C. $O_2N - CH = \underset{\underset{Cl}{|}}{C} - CH_3$

D. $CH_2 = \underset{\underset{NO_2}{|}}{C} - CH_3$

Answer: A

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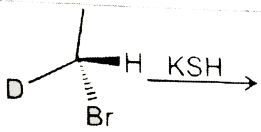
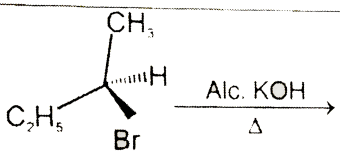
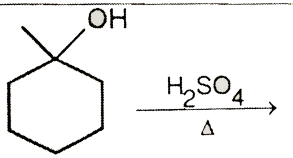
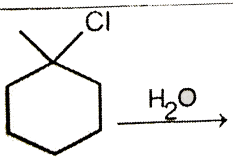
Exercise-1 Part-3

1. Match List I (Reaction) with List II (Type of reaction) and select the correct answer using the code given below the lists :

List I			List II
(P)		(1)	S_N1
(Q)		(2)	S_N2
(R)		(3)	E1
(S)		(4)	E2

A. $\begin{matrix} P & Q & R & S \\ 4 & 2 & 1 & 3 \end{matrix}$

B. $\begin{matrix} P & Q & R & S \\ 2 & 4 & 3 & 1 \end{matrix}$

C. $\begin{matrix} P & Q & R & S \\ 3 & 1 & 2 & 4 \end{matrix}$

D. $\begin{matrix} P & Q & R & S \\ 2 & 1 & 4 & 3 \end{matrix}$

Answer: B

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2. Match reactions written in List-I with their mechanism in List -II.

	List-I		List-II
(A)	$Ph-CH_2-CH_2-Br \xrightarrow{\text{aq. KOH}} Ph-\underset{\underset{OH}{|}}{CH}-CH_3 + Ph-CH=CH_2$	(p)	S_N1
(B)	$Ph-CH_2-CH_2-Br \xrightarrow[\Delta]{EtONa} Ph-CH_2-CH_2-OEt + Ph-CH=CH_2$	(q)	S_N2
(C)	$Ph-CH_2-CH_2-Br \xrightarrow[\Delta]{\ddot{E}t\ddot{O}/EtOD} Ph-CH=CH_2$	(r)	E_1
(D)	$Ph-CH_2-CH_2-Br \xrightarrow[\Delta]{\ddot{E}t\ddot{O}/EtOD} Ph-CH=CH_2 + Ph-CD_2-CH_2Br$	(s)	E_2
		(t)	E1cB

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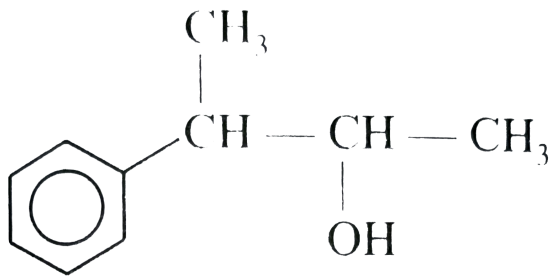
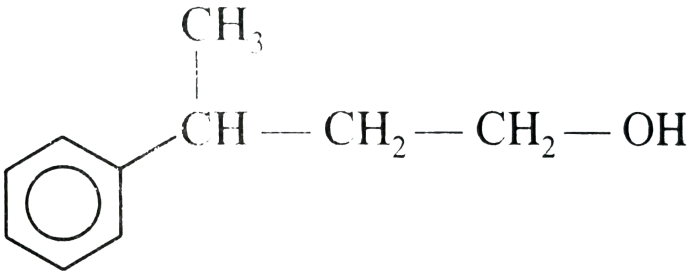
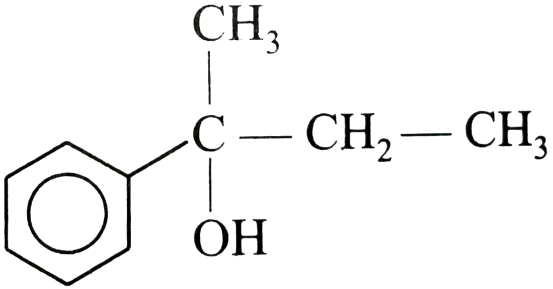
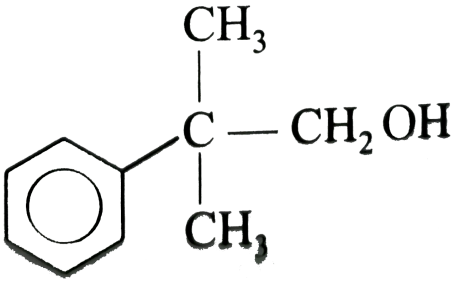
Exercise-2 Part-1

1. The relative rate of acid catalysed dehydration of following alcohols would be

I. 

II. 

III. 

IV. 

I.

A. $III > I > IV > II$

B. $III > IV > I > II$

C. $I > III > IV > II$

D. $IV > III > I > II$

Answer: D

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2. Which one of following compounds undergoes EI reaction most readily?

A. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Br}{|}}{C}} - CH_2 - CH_3$

B. $CH_3 - CH_2 - CH_2 - Br$

C. $CH_3 - CH_2 - CH_2 - I$

D. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{I}{|}}{C}} - CH_2 - CH_3$

Answer: D

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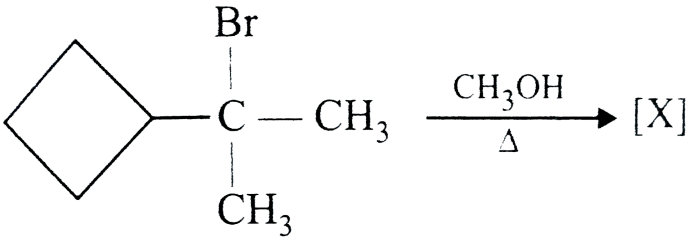
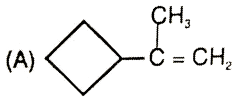
3. In the given reaction

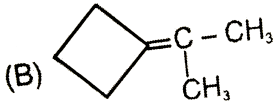
[X] as the major product among the elimination products is



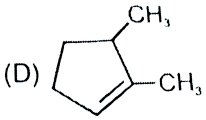
A.



B.



C.



D.

Answer: C

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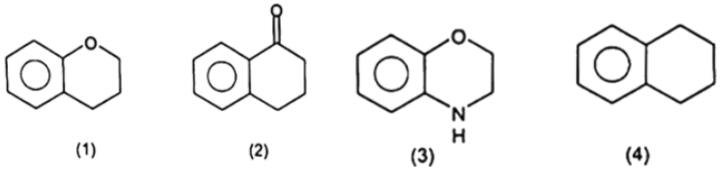
4. Rank the following compounds in decreasing order of reactivity in electrophilic aromatic substitution reaction



A. II gt I gt III

B. II gt III gt I

C. I gt III gt II

D. I gt II gt III

Answer: A

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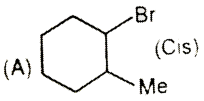
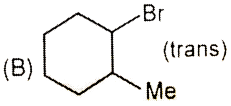
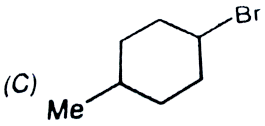
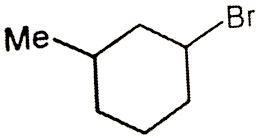
5. Which of the following compounds will not undergo azo coupling reaction with benzene diazonium chloride?

A. 

B. 

C. 

D. 

Answer: A

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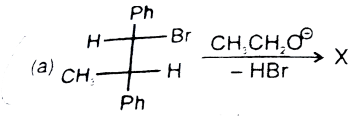
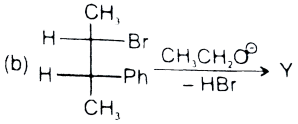
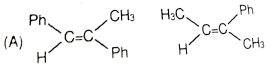
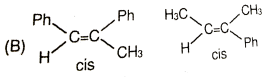
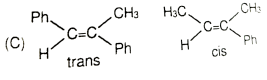
6. 

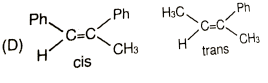


Identify the product of the following elimination reaction X and Y respectively with stereochemistry :

A. 

B. 

C. 

D. 

Answer: C

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7. Which mechanism has different reactivity order of alkyl halides $(1^\circ, 2^\circ, 3^\circ)$ than others :

A. S_N1

B. S_N2

C. E1

D. E2

Answer: B

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8. The correct order of $S_N2/E2$ ratio for the % yield of product of the following halide is-

(P)$CH_3-CH-\underset{I}{\overset{Ph}{\underset{|}{\overset{|}{C}}}}-CH_3$, (Q)$CH_3-\underset{Ph}{\underset{|}{CH}}-\underset{I}{\underset{|}{CH}}-CH_3$

(R)CH_3-CH_2-I , (S)$CH_3-CH-\underset{I}{\underset{|}{CH}}-CH_3$

A. R gt S gt Q gt P

B. R gt Q gt S gt P

C. P gt R gt S gt Q

D. Q gt P gt R gt S

Answer: A

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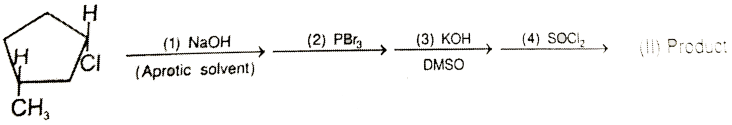
9. 

(I)(Reactant)

In this reaction I and II are ,

A. Enantiomers

B. Structure isomers

C. Geometrical isomers

D. Identical compounds

Answer: C

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10. Select the incorrect option of the following statements.

A. Bimolecular elimination of alkyl halides is a stereospecific reaction.

B. In S_N2 reaction a single isomer in the only product

C. Alcohol dehydrate in strongly basic conditions by E1 mechanism.

D. 3-hydroxypropanal dehydrates in strong basic condition by E1cb mechanism.

Answer: C

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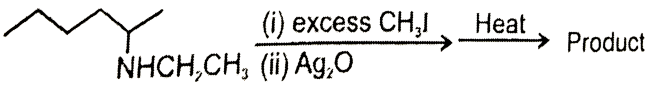
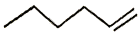
11. Predict the possible number of alkenes and the main alkene in the following reaction .



A. (A) 2 and 
(C) 4 and $H_2C{=}CH_2$

B. (B) 2 and 
(D) 3 and $H_2C{=}CH_2$

C.

D.

Answer: C

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Exercise-2 Part-2

1. X' is a smallest optically active alkanol. On dehydration it can form Y number of alkenes (including stereoisomers). On reaction with Lucas reagent it forms Z number of alkyl halides (including stereoisomers). Report your answer as ZY.

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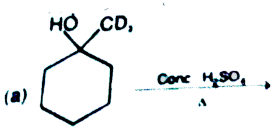
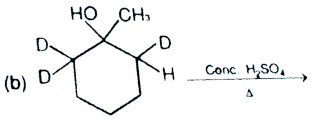
2. if the starting material is labelled with deuterium as indicated, predict how many total deuterium atoms will be present in the major elimination product ?





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3. The total number of alkenes possible by dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH is

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4. In the given reaction : $CH_3 - \underset{\underset{Ph}{|}}{CH} - \overset{\overset{OH}{|}}{CH} - CH_3 \xrightarrow[\Delta]{conc.\,H_2SO_4}$ Alkenes

Total number of alkenes (including stereo isomers) formed will be

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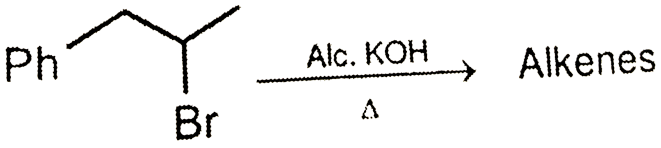

5.

the total number of possible alkenes in this elimination reaction is :

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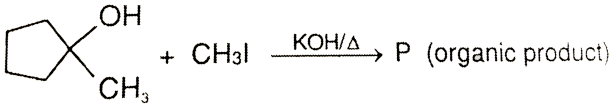
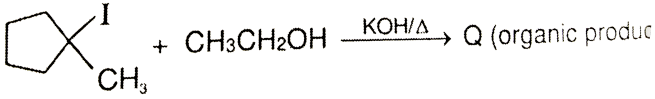
6. The difference of molecular weights of the major products P and Q form at the following reactions is

(i) 

(ii) 

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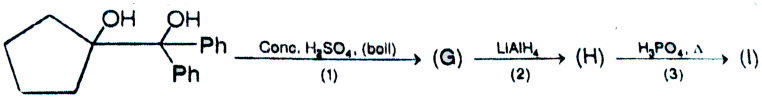
7. Observe the following reaction sequence



Calculate molecular mass [W] of product I and report your answer as N, where $N = W \div 3$.

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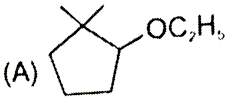
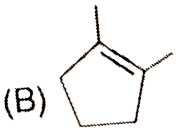
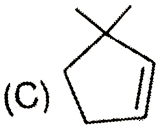
Exercise-2 Part-3

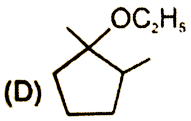
1. Predict the products expected in the given reaction

2-Bromo-1,1-dimethylcyclopentane $\xrightarrow[\Delta]{C_2H_5OH}$

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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2. Which of the following order is/are correct for the rate of E2 reaction ?

A. 5-Bromocycloheptene > 4-Bromocycloheptene

B. 2-Bromo-1-phenylbutane > 3-Bromo-1-phenylbutane

C. 3-Bromocyclohexene > Bromocyclohexane

D. 3-Bromo-2-methylpentane > 2-Bromo-4-methylpentane

Answer: B::C::D

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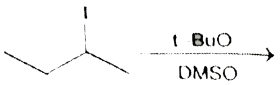
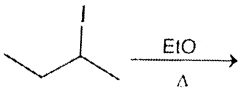
3. Which of the following statement (s) is/are true about the following eliminations ?

(I) 

(II) 

A. Hoffmann product is major product in I

B. Saytzeff product is major product in I

C. Hoffmann product is major product in II

D. Saytzeff product is major product in II

Answer: A::D

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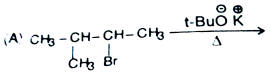
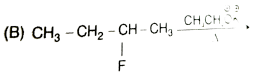
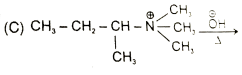
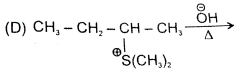
4. In which reaction product formation takes place by Hoffmann rule ?

A. 

B. 

C. 

D. 

Answer: A::B::C::D

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5. Which of the following compounds can give E1cB reaction ?

A. $CF_3 - CHCl_2$

B. $C_6H_5 - \underset{\underset{NO_2}{|}}{CH} - CH_2F$

C. $CH_3 - CH_2 - CH_2Br$

D. $C_6H_5 - \underset{\underset{OH}{|}}{CH} - CH_2 - CHO$

Answer: A::B::D

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6. Which of the following statement (s) is/are correct

A. E2 is a concerted reaction in which bonds break and new bonds form at the same time in a single step

B. Order of reactivity of alkyl halides towards E2 dehydrohalogenation is found to be $3^{\circ} > 2^{\circ} > 1^{\circ}$

C. In E2 reaction both β hydrogen and leaving group should be antiperiplanar.

D. In E2 elimination different stereoisomers (diastereomer) converts into different stereo product .

Answer: A::B::C::D

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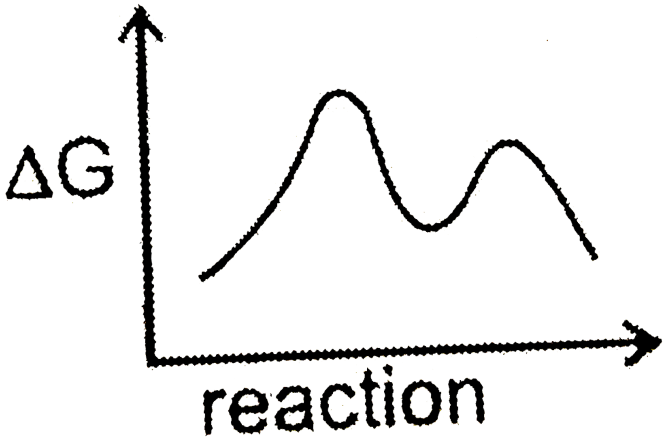
7. Following graph between ΔG and reaction progress in for/can be :



A. S_N1 reaction

B. E_1 reaction

C. Aromatic electrophilic substitution

D. Electrophilic addition reaction

Answer: A::B::C::D

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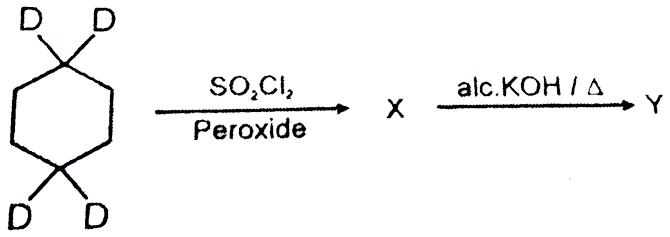
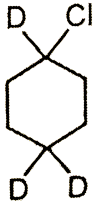
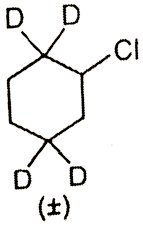
8. Which observation will be correct about the major products X and Y of the following reaction.



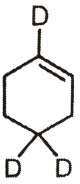
A. (A) X is



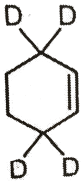
B. (B) X is



C. (C) Y is



(D) Y is



D.

Answer: B::D

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9. In which of the following reaction, regioselectivity cannot be observed ?

A. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{H}{|}}{C}} - CH_2 - Cl \xrightarrow{alc.KOH\ /\ \Delta}$

B. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{C}} - CH_3 \xrightarrow{alc.KOH\ /\ \Delta}$

C. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{C}} - CH_2 - CH_3 \xrightarrow{alc.KOH\ /\ \Delta}$

D. $CH_3 - \overset{\overset{CH_3}{|}}{C}H - \underset{\underset{Cl}{|}}{CH} - CH_3 \xrightarrow{alc.KOH\ /\ \Delta}$

Answer: C::D

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10. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{Cl}{|}}{C}} - CH_2 - CH_3 \xrightarrow{80\%\, EtOH}$

What is/are true about above reaction ?

A. Major product is given by S_N1 reaction.

B. Through E1 mechanism 3 alkenes are formed.

C. 3-Methylpentan-3-ol is also formed as one of the product

D. Fractional distillation of elimination products will give two fractions.

Answer: A::B::C

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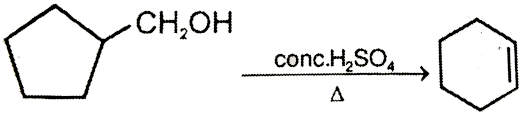
Exercise-2 Part-4

1. Alcohols undergo acid catalysed elimination reactions to produce alkenes. Because water is lost in the elimination , this reaction is called dehydration reaction. Secondary and tertiary alcohols always give E1 reaction in dehydration. Primary alcohols whose β-carbon is branched also give E1 reaction. The reactivity of alcohol for elimination reaction is tertiary alcohol > secondary alcohol > Primary alcohol.

Which of the following dehydration product (major) is incorrect ?

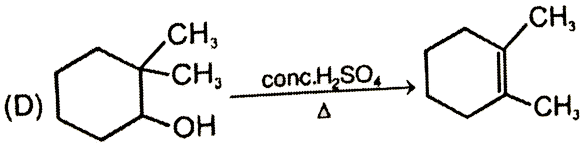
A.



B. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - \overset{\overset{OH}{|}}{CH} - CH_3 \xrightarrow[\Delta]{conc.\,H_2SO_4} CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH = CH_2$

C. $CH_3CH_2CH_2CH_2OH \xrightarrow[\Delta]{conc.\,H_2SO_4} CH_3 - CH = CH - CH_3$

D.



Answer: B

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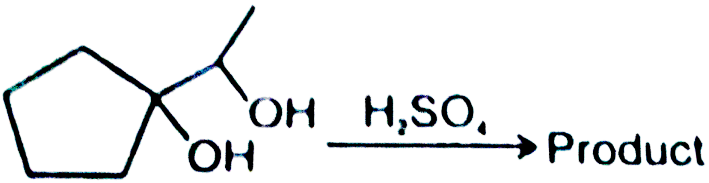
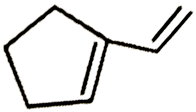
2. Alcohols undergo acid catalysed elimination reactions to produce alkenes. Because water is lost in the elimination , this reaction is called dehydration reaction. Secondary and tertiary alcohols always give E1 reaction in dehydration. Primary alcohols whose β-carbon is branched also give E1 reaction. The reactivity of alcohol for elimination reaction is tertiary alcohol gt secondary school gt Primary alcohol.

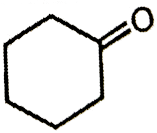
Identify the product in the given reaction :



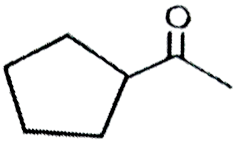
A.



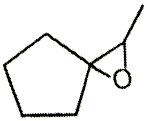
(B)



B.



C.



D.

Answer: C

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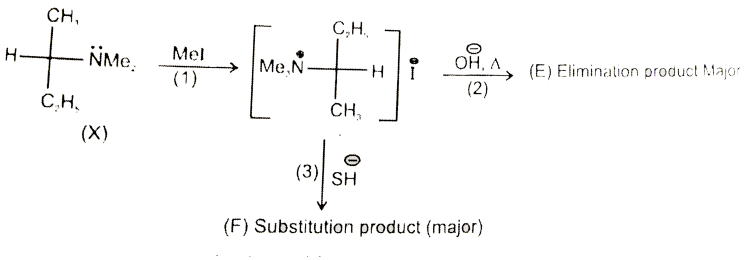
3.



The incorrect statement about step-1 is :

A. It is S_N2 reaction

B. Only one transition state is formed in this reaction

C. Walden inversion has occurred at reactant 'X'

D. The reaction has molecularity two

Answer: C

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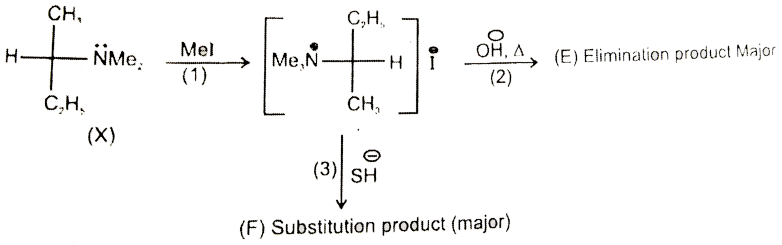

4.

The product 'E' is :

A. $CH_3 - CH_2 - CH = CH_2$

B. $CH_3 - CH = CH - CH_3$

C. $CH_2 = CH_2$

D. $CH_3 - CH = CH_2$

Answer: A

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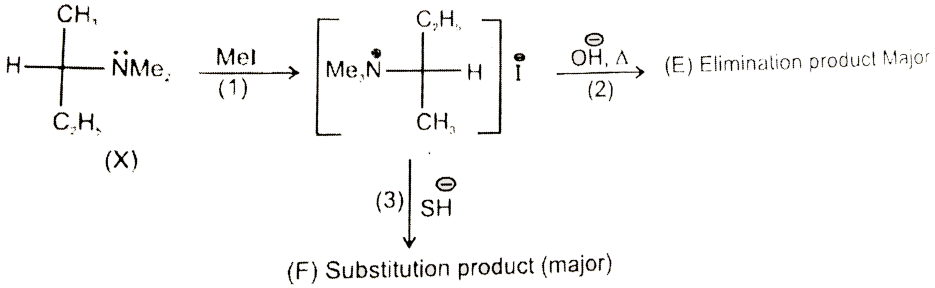
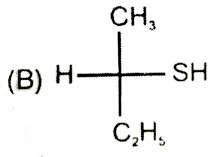
5.

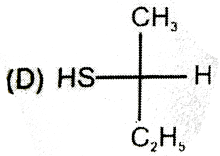


The product 'F' is :

A. $(A)\ C_2H_5SH$

B. 

C. $(C)\ CH_3SH$

D. 

Answer: C

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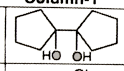
6.

Column-1		Column-2		Column-3	
(I)		(i)	Zn dust / Δ	(P)	
(II)		(ii)	Conc. H_2SO_4	(Q)	
(III)		(iii)	$HCl/ZnCl_2$	(R)	
(IV)		(iv)	Aqueous $AgNO_3$	(S)	

The bimolecular reaction is represented by :

A. (IV),(iii),(Q)

B. (I),(ii),(S)

C. (III),(ii),(P)

D. (II),(i),(R)

Answer: D

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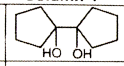
7.

Column-1		Column-2		Column-3	
(I)		(i)	Zn dust / Δ	(P)	
(II)		(ii)	Conc. H_2SO_4	(Q)	
(III)		(iii)	$HCl/ZnCl_2$	(R)	
(IV)		(iv)	Aqueous $AgNO_3$	(S)	

The dehydration reaction is represented by :

A. (III),(ii),(R)

B. (III),(iv),(P)

C. (I)(ii),(S)

D. (IV),(iii),(R)

Answer: C

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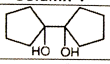
8.

Column-1		Column-2		Column-3	
(I)		(i)	Zn dust / Δ	(P)	
(II)		(ii)	Conc. H_2SO_4	(Q)	
(III)		(iii)	$HCl/ZnCl_2$	(R)	
(IV)		(iv)	Aqueous $AgNO_3$	(S)	

The unimolecular nucleophilic substitution is represented by :

A. (II),(iii),(Q)

B. (I),(iv),(S)

C. (IV),(iv),(Q)

D. (IV),(iii),(Q)

Answer: D

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Exercise-3 Part-1

1. Identify (X),(Y) and (Z) in the following synthetic scheme and write their structures.Explain the formation of labelled formaldehyde (H_2C^*O) as one of the products when compound (Z) is treated with HBr and subsequently ozonolysed .Mark the C^* carbon in the entire scheme .

$BaCO_3 + H_2SO_4 \rightarrow (X)$ gas [C^* denotes C^{14}]

$$CH_2 = CH - Br \xrightarrow[(iii)\,H_3O^+]{(i)\,Mg \quad \text{ether}} (ii) \quad X \; (Y) \xrightarrow{LiAlH_4} (Z)$$

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2. Identify the set of reagents/ reaction condition 'X' and 'Y' in the following set of transformations :

$$CH_3 - CH_2 - CH_2Br \xrightarrow{X} \text{Product} \xrightarrow{Y} CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3$$

A. X=concentrated alcoholic NaOH, $80^\circ C$, Y=HBr acetic acid , $20^\circ C$

B. X=dil.aq. NaOH , $20^\circ C$, Y=HBr/acetic acid , $20^\circ C$

C. X=dil.aq. NaOH , $20^\circ C$, $Y = Br_2/CHCl_3$, $0^\circ C$

D. X=conc.alc.NaOH, $80^\circ C$, Y=$Br_2/CHCl_3$, $0^\circ C$

Answer: A

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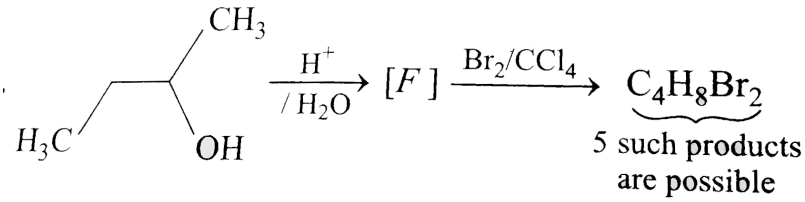
3.



How many structures of F is possible?

A. 2

B. 5

C. 6

D. 3

Answer: D

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4. Which of the reagents on reaction with cyclohexanol gives best yield of cyclohexene?

A. conc. HCl

B. conc. HBr

C. conc. H_3PO_4

D. $HCl + ZnCl_2$

Answer: C

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5. Match the following (one term in column-I may match with more than one terms in column-II).

	Column I		Column II
(A)	$CH_3-\underset{\displaystyle Br}{\underset{\vert}{CH}}-CD_3$ on reaction with $C_2H_5O^-$ gives $CH_2=CH-CD_3$	(p)	The reaction is E1
(B)	$PhCH_2CH_2Br$ gives elimination faster than $PhCD_2CH_2Br$. The mechanism is	(q)	The reaction is E2
(C)	$PhCH_2CH_2Br$ in presence of $C_2H_5OD/C_2H_5O^-$ gives good yield of $PhCD_2CH_2Br$ along with alkene	(r)	The reaction is E1 cB
(D)	$Ph-\underset{\displaystyle Br}{\underset{\vert}{CH}}-CD_3$ and $Ph-\underset{\displaystyle Br}{\underset{\vert}{CH}}-CH_3$ on elimination, yield alkene at the same rate	(s)	The reaction is unimolecular

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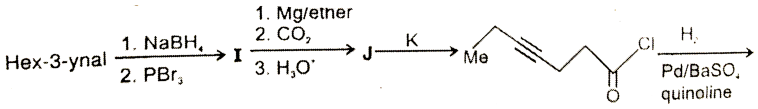
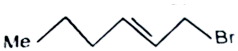
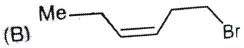
6. In the following reaction sequence , product I,J and L are formed , K represents a reagent.



The structure of the product I is

A. 

B. 

C. 

D. 

Answer: D

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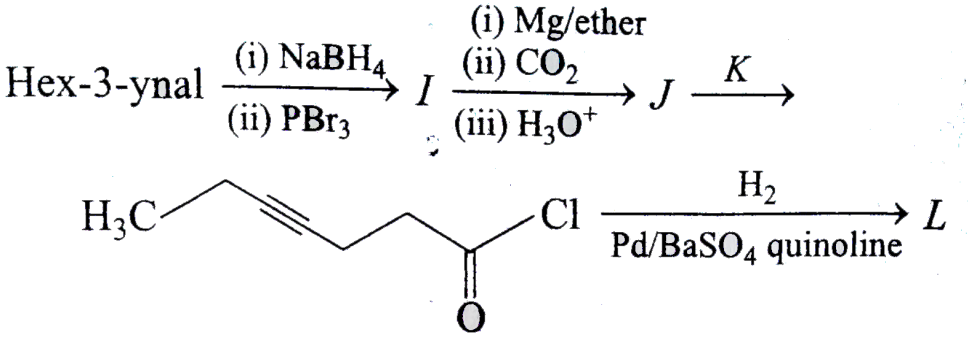
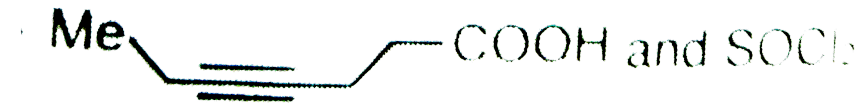
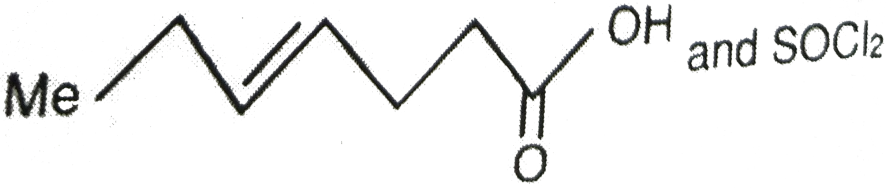
7. In the following sequence, product I, ,J and L are formed. K represents a reagent.



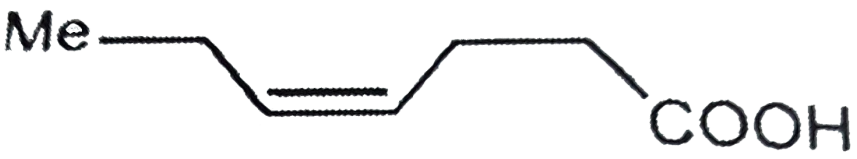
The structure of compound J and K respectively are



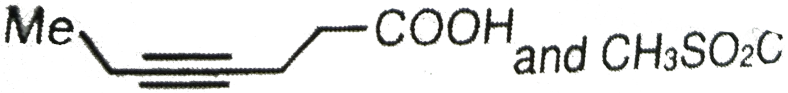
A.



B.



C.

(D) 

D.

Answer: A

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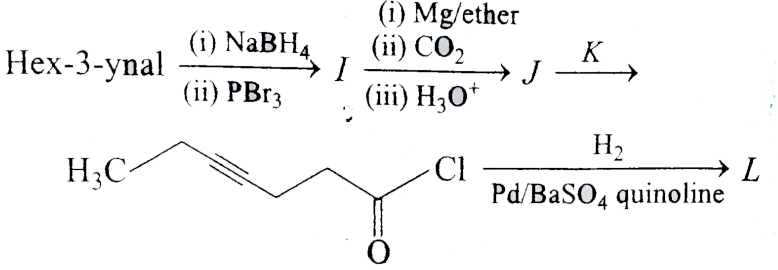
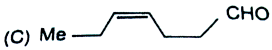
8. In the following sequence, product I,J and L are formedK represents a reagent.



The structure of products L is

A. 

B. 

C. 

D. 

Answer: C

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9. The total number of alkenes possible by dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH is

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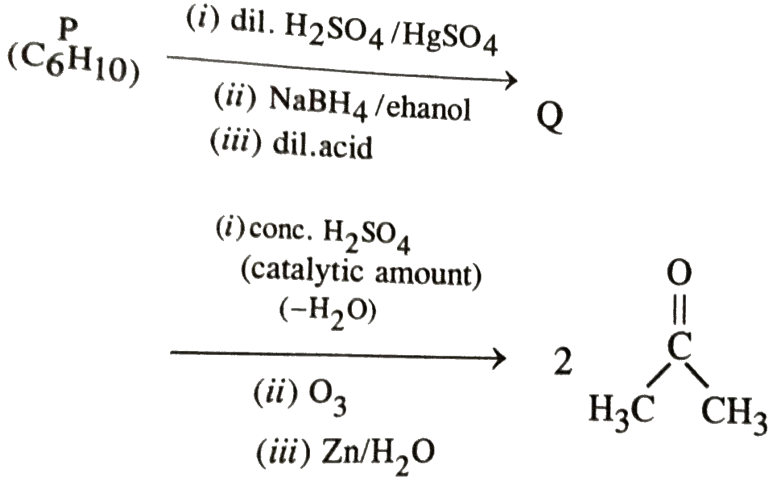
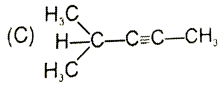
10. An acyclic hydrocarbon P, having molecular fromula C_6H_{10} gave acetone as the only organic product through the followig sequence of reaction in which Q is an intermediate organicn compound

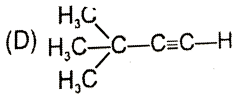


The structure of compound P is

A. $CH_3CH_2CH_2CH_2 - C \equiv C - H$

B. $H_3CH_2C - C \equiv C - CH_2CH_3$

C. (C) 

(D) 

D.

Answer: D

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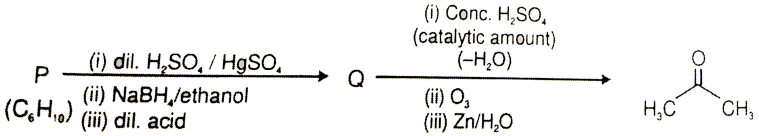
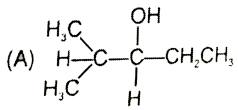
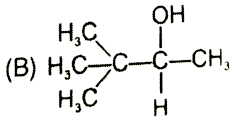
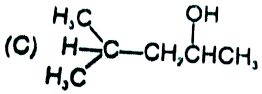
11. An acyclic hydrocarbon P, having molecular formula C_6H_{10} , gave acetone as the only organic product through the following sequence of reactions, in which Q is an intermediate organic compound.



The structure of compound Q is

A. (A) 

B. (B) 

C. 

D. $(D)\ CH_3CH_2CH_2CH(OH)CH_2CH_3$

Answer: B

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12. The major product (H) in the given reaction sequence is :

$$CH_3 - CH_2 - CO - CH_3 \xrightarrow{HCN} G \xrightarrow[\text{Heat}]{95\%\, H_2SO_4} H$$

A. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - COOH$

B. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - CN$

C. $CH_3 - CH_2 - \overset{\overset{OH}{|}}{\underset{\underset{CH_3}{|}}{C}} - COOH$

D. $CH_3 - CH = \underset{\underset{CH_3}{|}}{C} - CO - NH_2$

Answer: A

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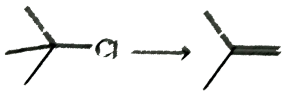
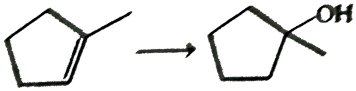
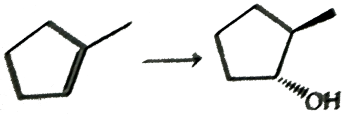
13. Match the chemical conversion in List-I with the approprotae reagents in List-II and select the correct answer using the code given below this list-

List-I

(P) 

(Q) 

(R) 

(S) 

List-II

(1) (i) $Hg(OAc)_2$ (ii) $NaBH_4$

(2) NaOEt

(3) Et-Br

(4) (i) BH_3 (ii) H_2O_2 /NaOH

,

A.

P	Q	R	S
2	3	1	4

B.

P	Q	R	S
3	2	1	4

C.

P	Q	R	S
2	3	4	1

D.

P	Q	R	S
3	2	4	1

Answer: A

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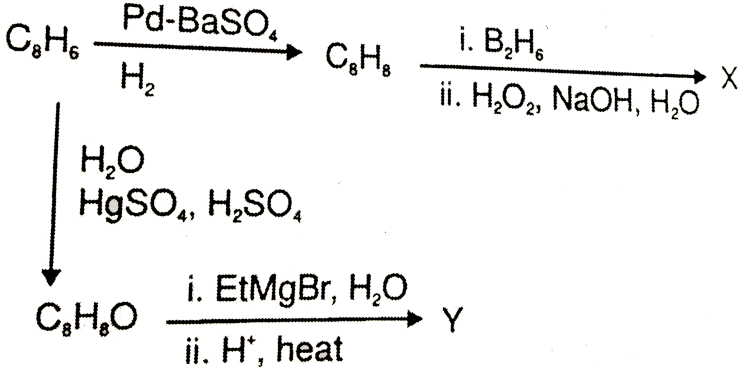
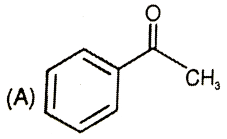
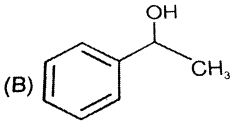
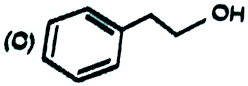
14. In the following reactions :

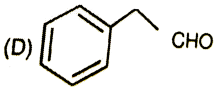


Compound X is

A. 

B. 

C. 

(D) 

D.

Answer: C

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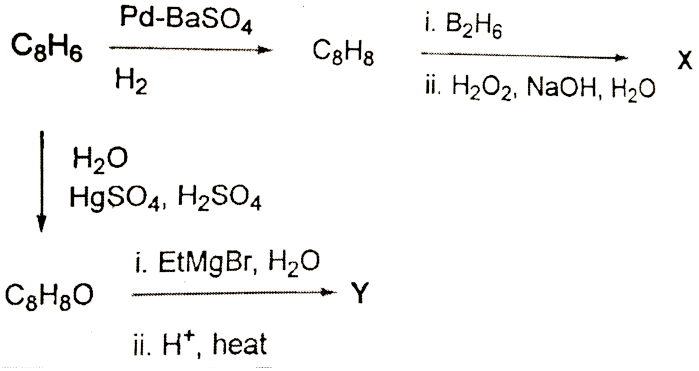
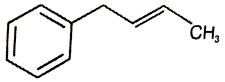
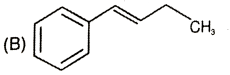
15. In the following reactoins

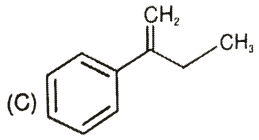


The major compound Y is

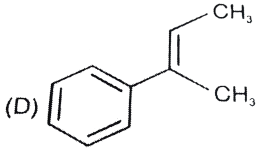
A. (A) 

B. (B) 

C.



D.



Answer: D

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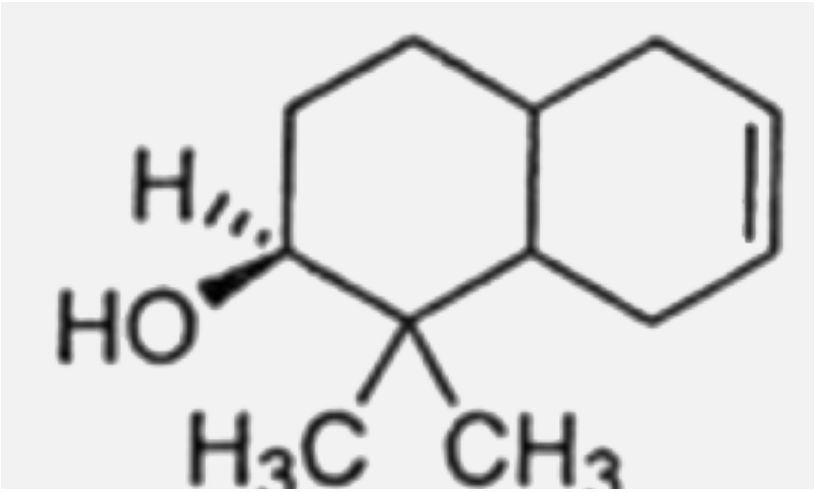
16. The number of hydroxyl group(s) in Q is



$$\xrightarrow[\text{heat}]{H^+} P \xrightarrow[0^\circ C]{\text{aqueous dilute } KMnO_4 \text{ (excess)}} Q$$

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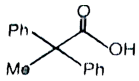
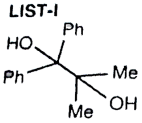
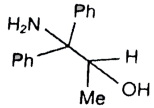
17. The desired product X can be prepared by reacting the major product of the reaction in LIST-1 with one or more appropriate reagents in LIST-II (Given . Order of migratory aptitude : aryl gt alkyl gt hydrogen)

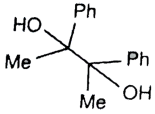


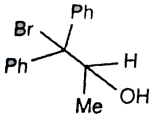
X

LIST-I

(P)  + H_2SO_4

(Q)  + HNO_2

(R)  + H_2SO_4

(S)  + $AgNO_3$

LIST-II

(1) I_2, NaOH

(2) $[Ag(NH_3)_2]OH$

(3) Fehling solution

(4) HCHO, NaOH

(5) NaOBr

A. P $\rightarrow$ 1 , Q $\rightarrow$ 2,3 , R $\rightarrow$ 1,4 , S $\rightarrow$ 2,4

B. P $\rightarrow$ 1,5 , Q $\rightarrow$ 3,4 , R $\rightarrow$ 4,5 , S $\rightarrow$ 3

C. P $\rightarrow$ 1,5 , Q $\rightarrow$ 3,4 , R $\rightarrow$ 5 , S $\rightarrow$ 2,4

D. P $\rightarrow$ 1,5 , Q $\rightarrow$ 2,3 , R $\rightarrow$ 1,5 , S $\rightarrow$ 2,3

Answer: D

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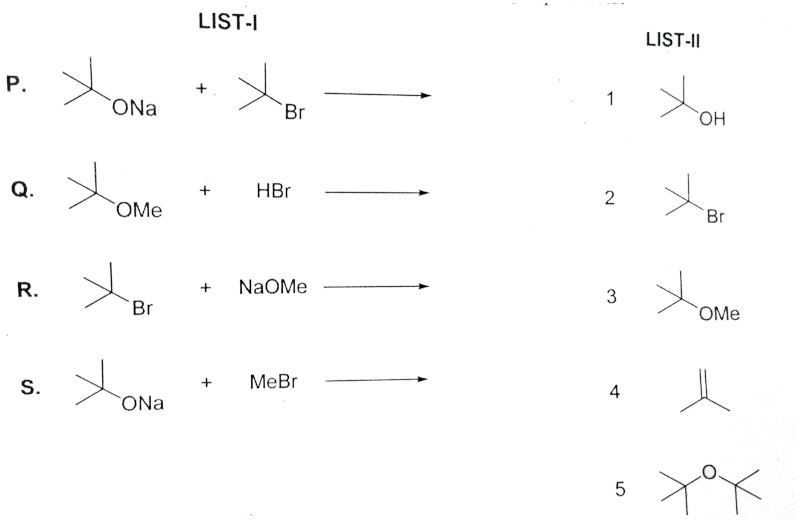
18. LIST-I contains reactions and LIST-II contains major products.



A. P $\rightarrow$ 1,5 , Q $\rightarrow$ 2 , R $\rightarrow$ 3 , S $\rightarrow$ 4

B. P $\rightarrow$ 1,4 , Q $\rightarrow$ 2 , R $\rightarrow$ 4 , S $\rightarrow$ 3

C. P $\rightarrow$ 1,4 , Q $\rightarrow$ 1,2 , R $\rightarrow$ 3,4 , S $\rightarrow$ 4

D. P $\rightarrow$ 4,5 , Q $\rightarrow$ 4 , R $\rightarrow$ 4 , S $\rightarrow$ 3,4

Answer: B

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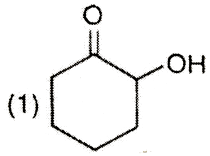
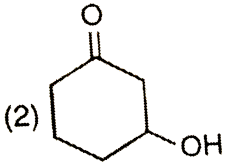
Exercise-3 Part-2 JEE (MAIN) OFFLINE PROBLEMS

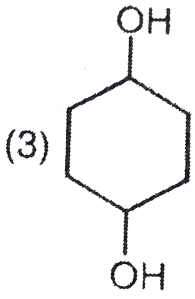
1. Maximum dehydration takes place that of-



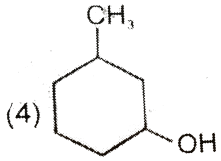
A.



B.



C.



D.

Answer: B

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2. During dehydration of alcohols to alkenes by heating with conc. H_2SO_4 the initiation step is :

A. Protonation of alcohol molecule

B. Formation of carbocation

C. Elimination of water

D. Formation of an ester

Answer: A

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3. Elimination of HBr from 2 bromobutane results in the formation of .

A. Predominantly 2-butyne

B. Predominantly 1-butene

C. Predominantly 2-butene

D. Equimolar mixture of 1 and 2-butene

Answer: C

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4. Reaction of trans-2-phenyl-1-bromocyclopentane on reaction with alcoholic KOH produces

A. 2-phenylcyclopentene

B. 1-phenylcyclopentene

C. 3-phenylcyclopentene

D. 4-phenylcyclopentene

Answer: C

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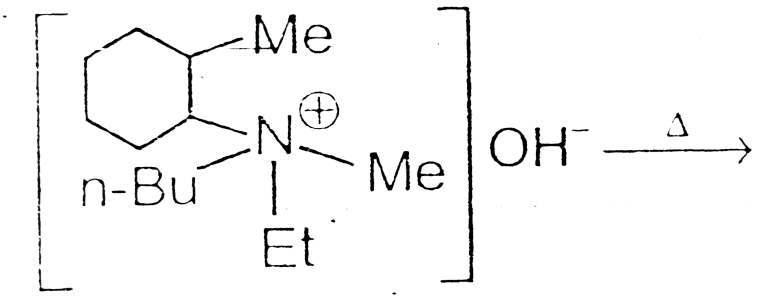


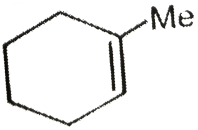
5.

The alkene formed as a major product in the above elimination reaction is

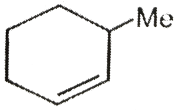
A. (1)

B. $CH_2 = CH_2$

C. (3)



D. (4)



Answer: B

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6. In the reaction

$$CH_3COOH \xrightarrow{LiAlH_4} A \xrightarrow{PCl_g} B \xrightarrow{Alc.KOH} C.$$

the product C is :

A. Acetaldehyde

B. Acetylene

C. Ethylene

D. Acetyl chloride

Answer: C

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7. 2-Chloro-2-methylpentane on reaction with sodium methoxide in methanol yields :

(a) $C_2H_5CH_2\overset{CH_3}{\underset{CH_3}{\overset{|}{\underset{|}{C}}}} - OCH_3$

(b) $C_2H_5CH_2\underset{CH_3}{\overset{|}{C}} = CH_2$

(c) $C_2H_5CH = \underset{CH_3}{\overset{|}{C}} - CH_3$

A. (a) and (c)

B. (c) only

C. (a) and (b)

D. All of these

Answer: D

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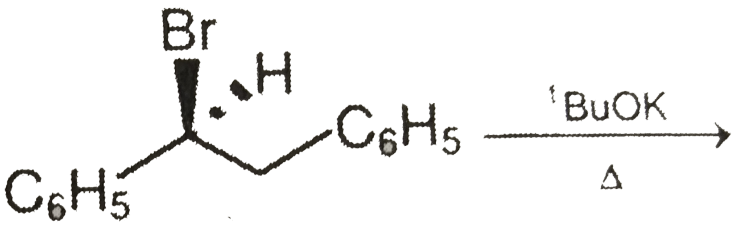
8. The major product obtained in the following reaction is :



A. $C_6H_5CH = CHC_6H_5$

B. $(+)C_6H_5CH(O^tBu)CH_2C_6H_5$

C. $(-)C_6H_5CH(O^tBu)CH_2C_6H_5$

D. $(\pm)C_6H_5CH(O^tBu)CH_2C_6H_5$

Answer: A

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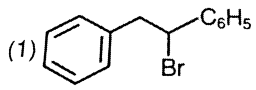
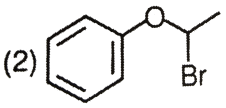
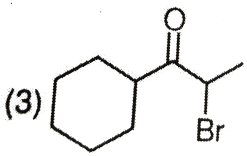
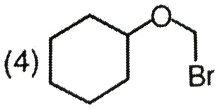
9. Which of the following , upon treatment with tert-BuONa followed by addition of bromine water , fails to decolourise the colour of bromine ?

A. 

B. 

C. 

D. 

Answer: D

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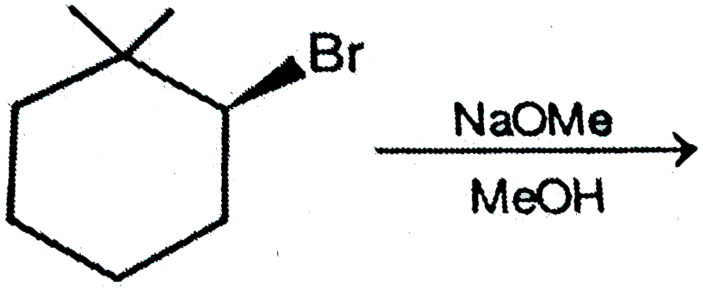
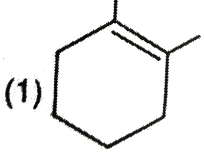
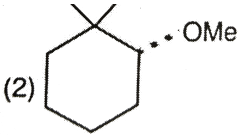
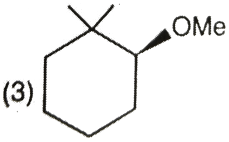
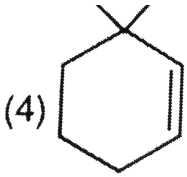
10. The major product of the following reaction is :



A. 

B. 

C. 

D. 

Answer: D

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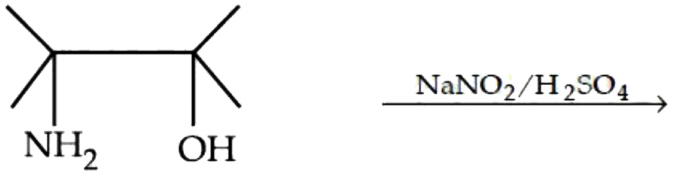
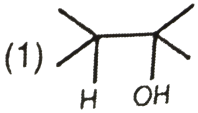
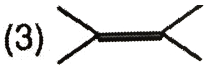
Exercise-3 Part-2 JEE (MAIN) ONLINE PROBLEMS

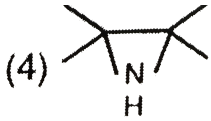
1. The major product of the reaction is



A. 

B. 

C. 

D. 

Answer: B

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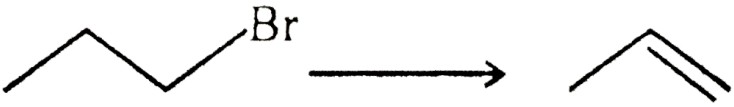
2. Which one of the following reagents is not suitable for the elimination reaction?



A. NaI

B. NaOH/H_2O-EtOH

C. NaOH/H_2O

D. NaOEt/EtOH

Answer: A

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3. The major product of the following reaction is :

$$CH_3\underset{Br}{C}HCH_2\underset{Br}{C}HCH_2CH_3 \xrightarrow[\text{heat}]{KOH\,,CH_3OH}$$

A. $CH_3CH=C=CHCH_2CH_3$

B. $CH_2 = CHCH = CHCH_2CH_3$

C. $CH_3CH = CH - CH = CHCH_3$

D. $CH_2 = CHCH_2CH = CHCH_3$

Answer: C

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4. The major product of the following reaction is :

$$C_6H_5CH_2 - \overset{\overset{CH_3}{|}}{\underset{\underset{Br}{|}}{C}} - CH_2CH_3 \xrightarrow[C_2H_5OH]{C_2H_5ONa}$$

A. $C_6H_5CH_2 - \underset{\underset{CH_3}{|}}{C} = CHCH_3$

B. $C_6H_5CH_2 - \underset{\underset{CH_2CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} = CH_2$

C. $C_6H_5CH_2 - \underset{\underset{OC_2H_5}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_2CH_3$

D. $C_6H_5CH = \underset{\underset{CH_3}{|}}{C} - CH_2CH_3$

Answer: D

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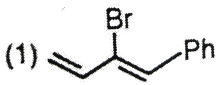
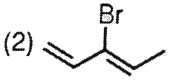
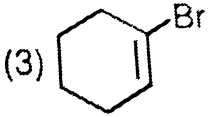
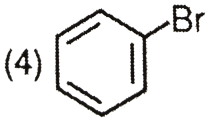
5. Which of the following will most readily give the dehydrohalogenation product ?

A. 

B. 

C. 

D. 

Answer: A

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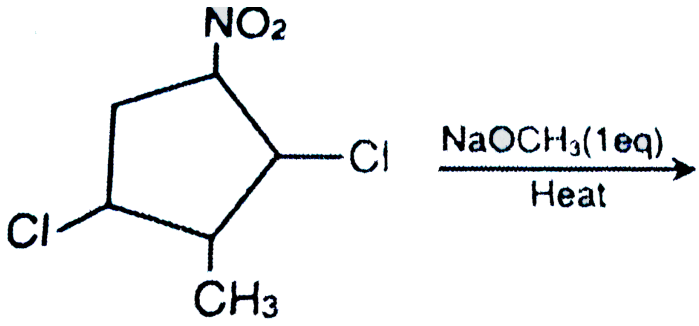
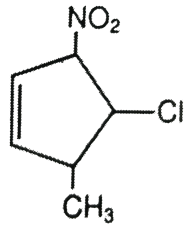
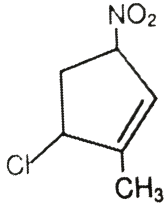
6. The major product formed in the following reactions is :



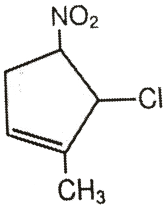
A. (1)



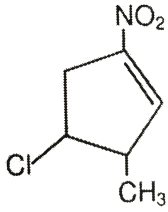
B. (2)



C. (3)



D. (4)



Answer: D

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7. Which of the following compounds will most readily be dehydrated to give alkene under acidic condition ?

A. 4-Hydroxypentan-2-one

B. 3-Hydroxypentan-2-one

C. 1-Pentanol

D. 2-Hydroxycyclopentanone

Answer: A

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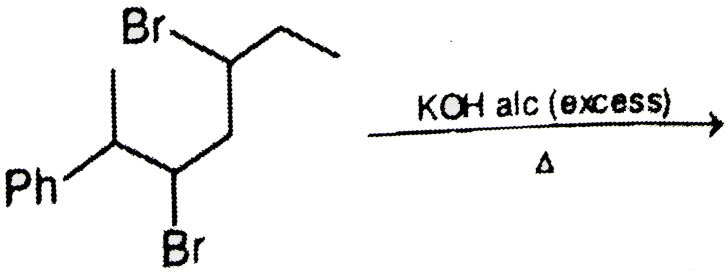
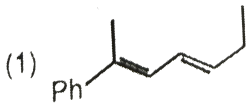
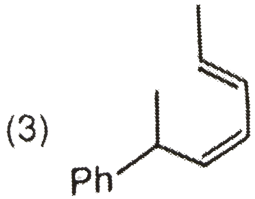
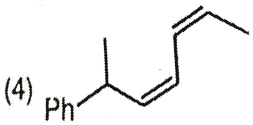
8. The major product of the following reaction is :



A. 

B.

C. 

D. 

Answer: A

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9. The major product of the following reaction is :

$$CH_3CH_2\underset{\underset{Br}{|}}{CH} - \underset{\underset{Br}{|}}{CH_2} \xrightarrow[II.\,NaNH_2 \text{in liq.} NH_3]{I.\,KOH alc.}$$

A. $CH_3CH = C = CH_2$

B. $CH_3CH = CHCH_2NH_2$

C. $CH_3CH_2C \equiv CH$

D. $CH_3CH_2\underset{\underset{NH_2}{|}}{CH} - \underset{\underset{NH_2}{|}}{CH_2}$

Answer: C

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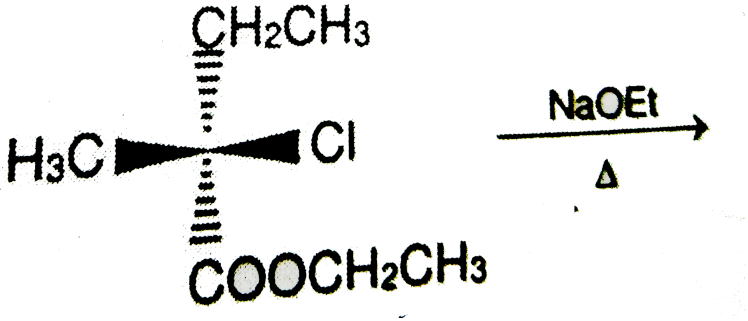
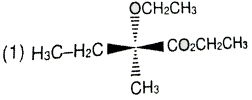
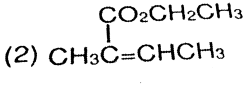
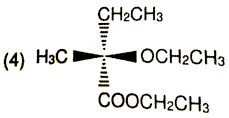
10. The major product of the following reaction is :



A. 

B. 

C. $CH_3CH_2 \quad \underset{\underset{CO_2CH_2CH_3}{|}}{C} \quad = CH_2$

D. 

Answer: B

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APSP PART-1

1. $CH_3 - \underset{\underset{O}{||}}{C} - CH_3 + PhMgBr \rightarrow A \xrightarrow{H_3O^+} B \xrightarrow[\Delta]{H_3PO_4} C$

C is :

A. $Ph - \underset{\underset{O}{||}}{C} - CH_3$

B. $Ph - \overset{\overset{CH_3}{|}}{\underset{\underset{OH}{|}}{C}} - CH_3$

C. $Ph - \underset{\underset{CH_3}{|}}{C} = CH_2$

D. $Ph - \underset{\underset{CH_3}{|}}{CH} - CH_3$

Answer: C

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2. The correct increasing order of reactivity for following alkyl halides towards elimination reaction with alcoholic KOH is :

(I) $CH_3 - \underset{\underset{Cl}{|}}{CH} - CH_3$ $(II) CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Br}{|}}{C}} - CH_2CH_3$ $(III) CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Cl}{|}}{C}} - CH$

A. II gt I gt III

B. I gt II gt III

C. II gt III gt I

D. III gt II gt I

Answer: C

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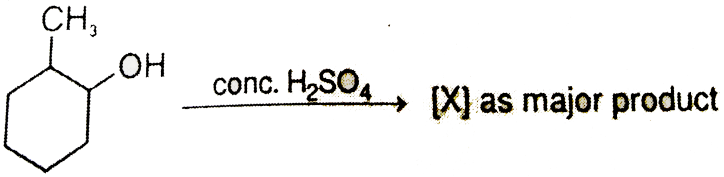
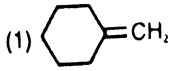
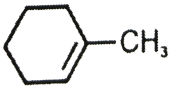
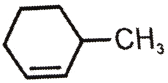
3. In the given reaction :

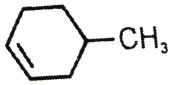


[X] will be :

A. (1) 

B. (2) 

C. (3) 

D. (4) 

Answer: B

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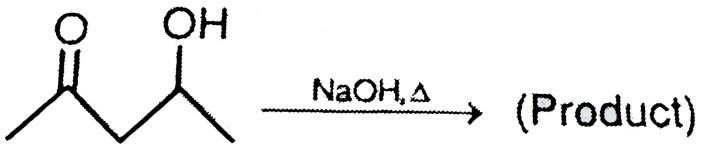
4. 

The major product of the above reaction is obtained by mechanism

A. S_N2

B. $E2$

C. E1cB

D. S_N1

Answer: C

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5. Select the incorrect option of the following statements.

A. Bimolecular elimination of alkyl halides is a stereospecific reaction.

B. In S_N2 reaction a single isomer in the only product

C. Alcohol dehydrate in strongly basic conditions by E1 mechanism.

D. 3-hydroxypropanal dehydrates in strong basic condition by E1cb mechanism.

Answer: C

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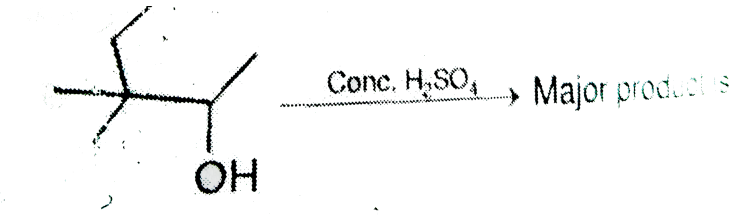
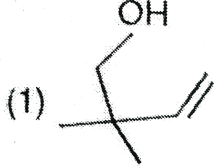
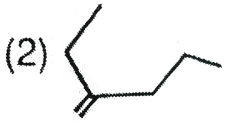
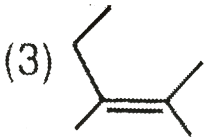
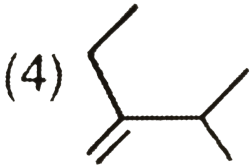
6. Complete the following reaction



A. 

B. 

C. 

D. 

Answer: C

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7. Which of the following conformations of meso 2,3-dibromobutane will give bromoalkene with alcoholic KOH ?

A. Gauche form

B. Anti form

C. Partial eclipsed form

D. Fully eclipsed form

Answer: A

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8. 2-Bromopentane is heated with potassium ethoxide in ethanol. The major product obtained is

A. 2-Ethoxypentane

B. pent-1-ene

C. cis-pent-2-ene

D. trans-pent-2-ene

Answer: D

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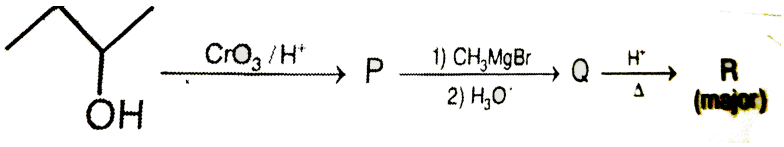
9. 

R is :

A. But-1-ene

B. 2-methylbut-1-ene

C. 2-methylbut-2-ene

D. 2-methyl propene

Answer: C

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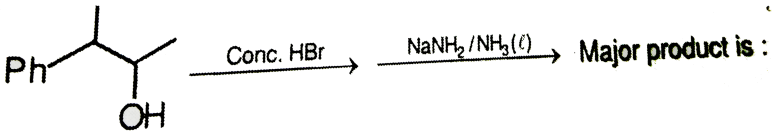
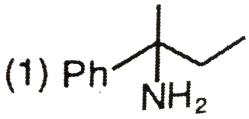
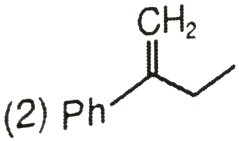
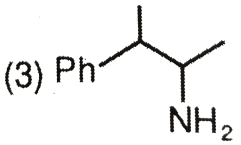
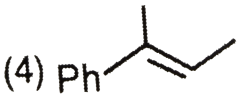
10. Complete the following reaction



A. 

B. 

C. 

D. 

Answer: D

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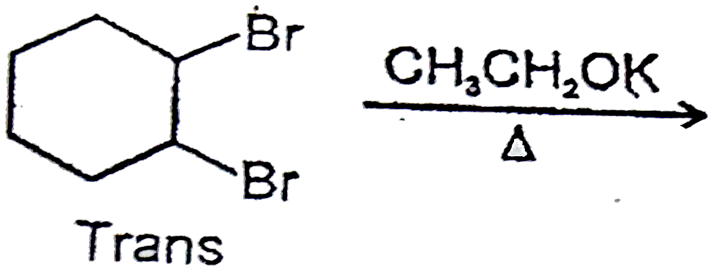
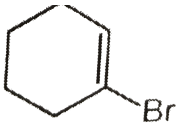
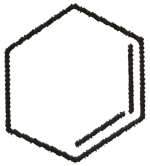
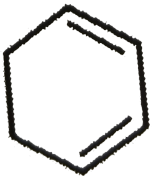
11. The most probable product in the following reaction is :



Trans

A. (1) 

B. (2) 

C. (3) 

D. (4) 

Answer: C

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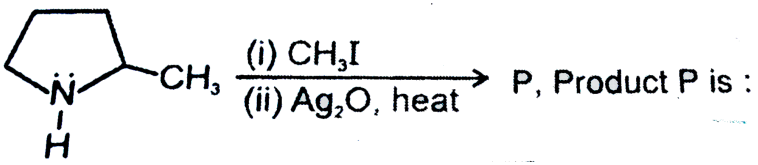
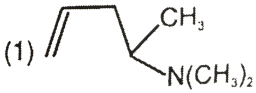
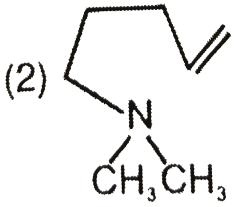
12. Complete the following reaction



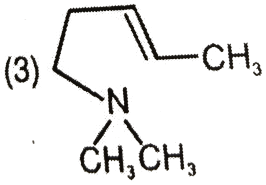
A.



B.



C.



D. None

Answer: B

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13. Which statement is false for elimination reaction .

A. β-elimination is more common than α & γ elimination

B. In β-elimination , formation of multiple bond occur

C. β-elimination may be E1, E2 or E1cB

D. E1 & E2 requires presence of poor leaving group but E1cB requires presence of good leaving group.

Answer: D

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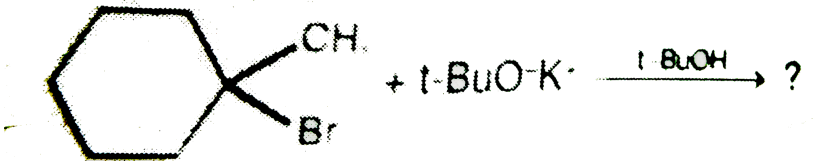
14. Which of the following statement is correct regarding following reaction ?



A. Major product is endocyclic alkene formed according to Saytzeff.

B. Major product is exocyclic alkene formed according to Satyzeff.

C. Major product is exocyclic alkene formed according to Hoffmann.

D. Major product is endocyclic alkene formed according to Hoffmann.

Answer: C

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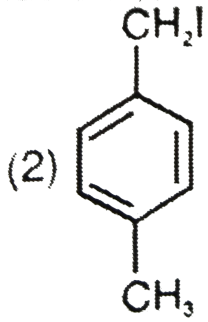
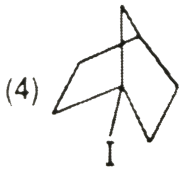
15. Substrate that show E1 reaction

A. CH_3CH_2I

B. 

C. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - CH_2 - I$

D. 

Answer: C

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16. Which of the following compound will give three alkenes after dehydrohalogenation.

A. $CH_3 - CH_2 - CH_2 - CH_2 - Br$

B. $CH_3 - CH_2 - \underset{\underset{Br}{|}}{CH} - CH_3$

C. $CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{Br}{|}}{C}} - CH_3$

D. $CH_3 - CH_2 - \underset{\underset{Br}{|}}{CH} - Ph$

Answer: B

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17.

$$PhSO_2CH_2 - CH_2 - OMe \xrightarrow[EtOD]{EtO^{\theta}} \text{product} + \underset{\text{(recovered reactant)}}{PhSO_2 - \overset{\overset{D}{|}}{CH} - CH_2OMe}$$

.

The product is :

A. $PhSO_2CH = CH_2$

B. $CH_2 = CH - OMe$

C. $PhSO_2CH_2 - CD_2OMe$

D. $CD_2 = CH_2$

Answer: A

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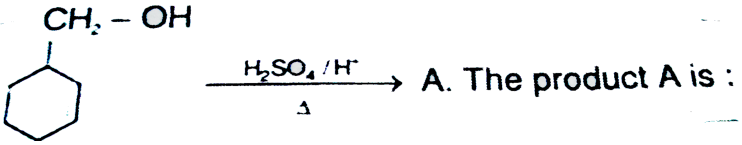
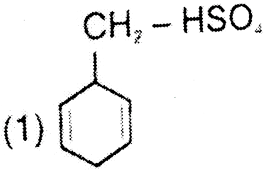
18. Complete the following reaction



A.



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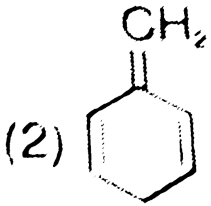
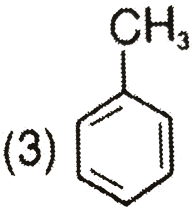
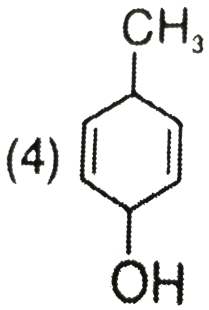


C.





D.

Answer: C

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19. Typical features of E2 involve :

A. Two step reaction

B. Second step is the rate determining step

C. Anti-periplanar transition state

D. Formation of a carbanion intermediate, stabilized by conjugation with a strong -M group.

Answer: C

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20. An alkyl chloride produces a single alkene on reaction with sodium ethoxide and ethanol. The alkene further undergoes hydrogenation to yield 2- methylbutane. Identify the alkyl chloride from amongst the following

A. $ClCH_2C(CH_3)_2CH_3$

B. $ClCH_2CH_2CH_2CH_3$

C. $ClCH_2CH(CH_3)CH_2CH_3$

D. $CH_3C(Cl)(CH_3)CH_2CH_3$

Answer: C

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21. The relative ease of dehydration of alcohols follows following order :

A. $3^{\circ} > 2^{\circ} > 1^{\circ}$ alc.

B. $1^{\circ} > 2^{\circ} > 3^{\circ}$ alc.

C. $2^{\circ} > 3^{\circ} > 1^{\circ}$ alc.

D. $3^{\circ} > 1^{\circ} > 2^{\circ}$ alc.

Answer: A

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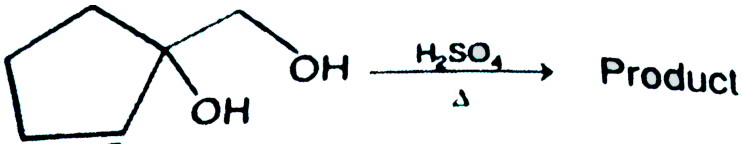
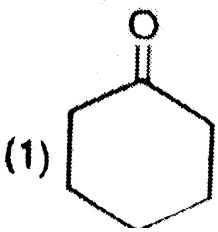
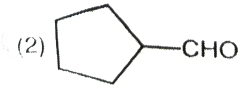
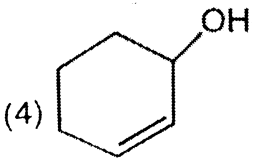
22. Which of the following is the correct major product for given reaction ?



A. 

B. 

C. 

D. 

Answer: B

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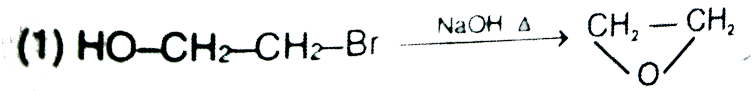
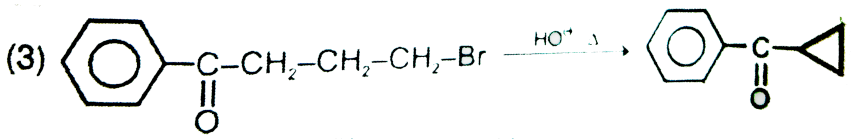
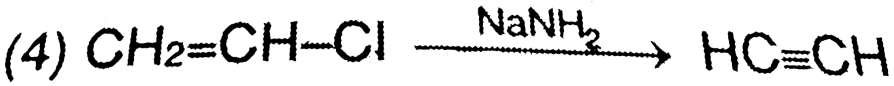
23. Which of the following is a β-elimination reaction ?

A. 

B. (2) $CHCl_3 + KOH \xrightarrow{\Delta} CCl_3$

C. 

D. 

Answer: D

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24. Correct order of E_2 / S_N2 ratio is :

A. P > Q > S > R

B. P > Q > R > S

C. R > S > Q > P

D. P > S > Q > R

Answer: A

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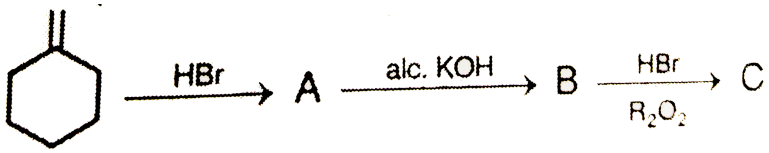
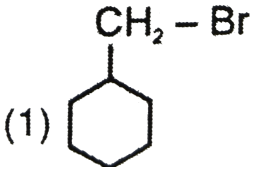
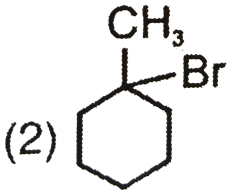
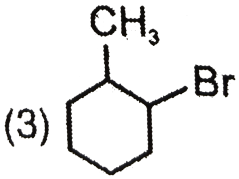
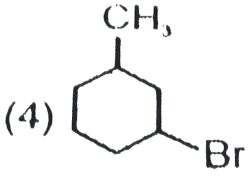
25. The product C of the following sequence is :



A. (1) 

B. (2) 

C. (3) 

D. (4) 

Answer: C

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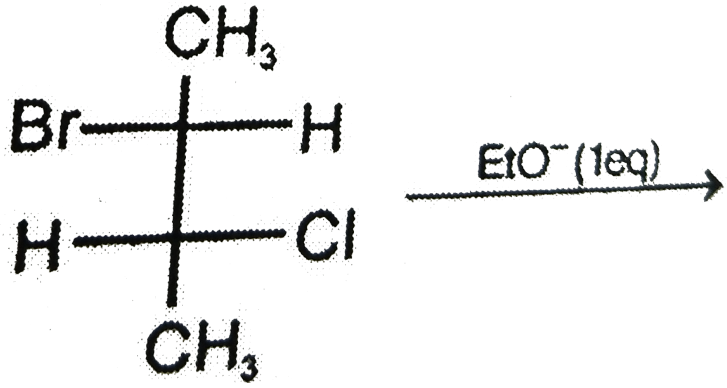
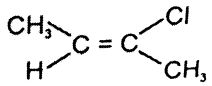
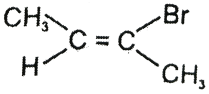
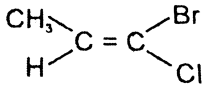
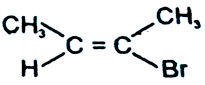
26. The major product of the following reaction is



A. (1) 

B. (2) 

C. (3) 

D. (4) 

Answer: A

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27. What is the correct sequence of reagents for the following conversion :

$$CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3 \rightarrow CH_3 - CH_2 - CH_2 - I$$

A. $\xrightarrow{alc.KOH} \xrightarrow{HI}$

B. $\xrightarrow{aq.KOH} \xrightarrow[\Delta]{H_2SO_4} \xrightarrow{HI}$

C. $\xrightarrow{alc.KOH} \xrightarrow{HBr/R_2O_2} \xrightarrow[\text{acetone}]{KI}$

D. $\xrightarrow{alc.KOH} \xrightarrow{HCl} \xrightarrow[\text{acetone}]{KI}$

Answer: C

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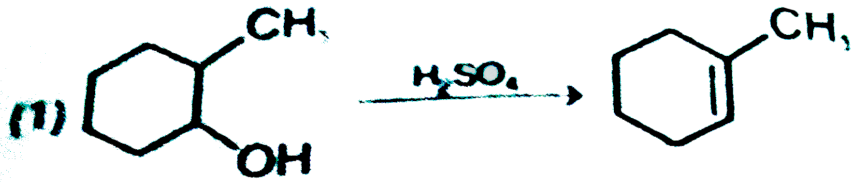
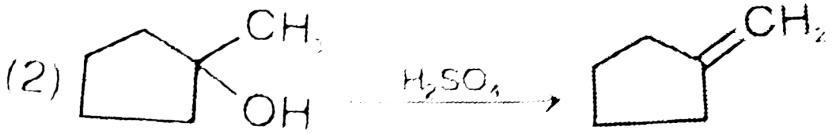
28. In which of the following reaction the single product formed is not the saytzeff's product

A.



B.



C.

D.

Answer: B

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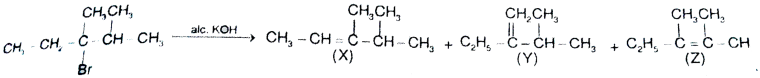
29. In the following reaction the correct order of percentage of products X, Y and Z is



A. X gt Y gt Z

B. Z gt Y gt X

C. Z gt X gt Y

D. Y gt Z gt X

Answer: C

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30. The rate of elimination is fastest in

A. $Ph - CH_2 - CH_2 - F$

B. $Ph - \underset{\underset{O}{||}}{C} - CH_2 - CH_2 - F$

C. $Ph - O - CH_2 - CH_2 - F$

D. $CH_3 - CH_2 - CH_2 - F$

Answer: B

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APSP PART-2

1. An alkyl bromide produces a single alkene when it reacts with sodium ethoxide and ethanol. This alkene undergoes hydrogenation and produces 2-methylbutane. What is the alkybromide ?

A. 1-bromo-2-methylbutane

B. 1-bromobutane

C. 1-bromo-2,2-dimethylpropane

D. 2-bromo-2-methylbutane

Answer: A

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2. Which of the following most readily undergoes E_2 elimination with a strong base?

A. 2-bromopentane

B. 2-bromo-2-methylbutane

C. 1-bromo-2,2dimethyl propane

D. 2-bromo-3-methylbutane

Answer: B

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3. An alkyl chloride produces a single alkene on reaction with sodium ethoxide and ethanol. The alkene further undergoes hydrogenation to yield 2- methylbutane. Identify the alkyl chloride from amongst the following

A. $ClCH_2CH(CH_3)CH_2CH_3$

B. $ClCH_2CH_2CH_2CH_3$

C. $ClCHC(CH_3)_2CH_3$

D. $CH_3C(Cl)(CH_3)CH_2CH_3$

Answer: A

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4. On heating glycerol with conc. H_2SO_4 ,a compound is obtained which has bed odour. The compound is

A. ethylene glycol

B. allyl alcohol

C. acrolein

D. glycerol sulphate

Answer: C

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5. n-propyl bromide on treatment with ethanolic potassium hydroxide produce

A. propyne

B. propene

C. propane

D. propanol

Answer: B

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6. The peroxide effect occurs by :

A. ionic mechanism

B. heterolytic fission of double bond

C. homolytic fission of double bond

D. free radical mechanism

Answer: D

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7. Acid catalysed dehydration of 2-pentanol would give

A. 1-pentene as a major product

B. cis 2-pentene as a major product

C. trans-2-pentene as a major product

D. cis- and trans - 2-pentene in equal amount.

Answer: C

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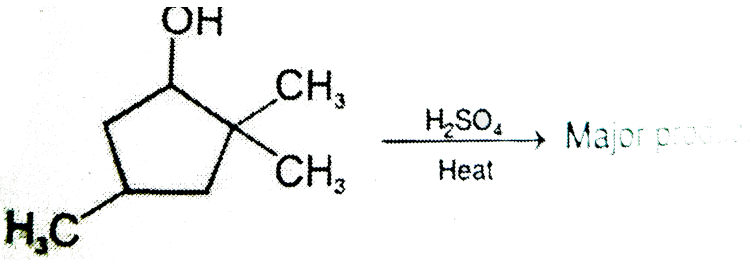
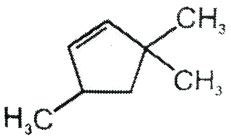
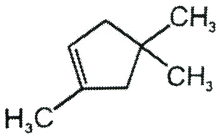
8. The major product formed in the following reactions is :



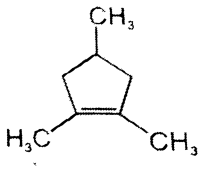
A. (A)



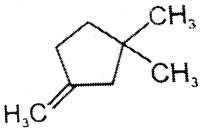
B. (B)



C. (C)



D. (D)



Answer: C

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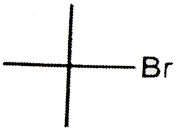
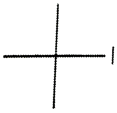
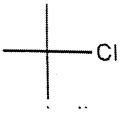
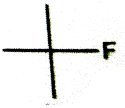
9. Arrange the following compounds in order of decreasing reactivity in the elimination (bimolecular) reaction with C_2H_5ONa

(i) 

(ii) 

(iii) 

(iv) 

A. $II > I > III > IV$

B. $IV > III > I > II$

C. $III > I > II > IV$

D. $I > III > IV > II$

Answer: A

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10. Compound X on treatment with HI give Y, Y on treatment with ethanolic KOH gives Z (an isomer of X). Ozonolysis of Z (with H_2O_2

workup) gives a two -carbon carboxylic acid and four carbon ketone . Hence, X is :

A. 2-methyl-2-pentene

B. 4-methyl-1-pentene

C. 2,3-dimethyl-2-butene

D. 3-methyl-1-pentene

Answer: D

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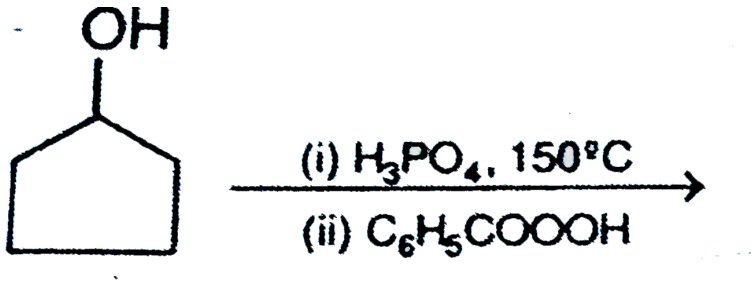
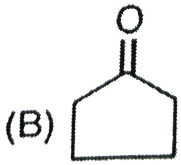
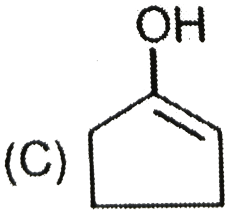
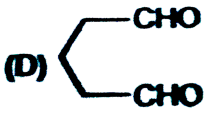
11. The major product of the following reactions is :



A. 

B. 

C. 

D. 

Answer: A

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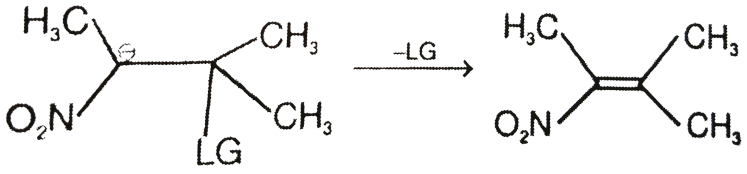
12.



The carbanion expels a leaving group LG to yield an alkene as shown above by

A. E1cB mechanism

B. E1 mechanism

C. E2 mechanism

D. Such a reaction does not take place

Answer: A

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13. The compound that is most reactive with alcoholic KOH is

A. $CH_2 = CH - Br$

B. CH_3CH_2Br

C. $(CH_3)_2CH - Br$

D. $CH_3COCH_2CH_2Br$

Answer: D

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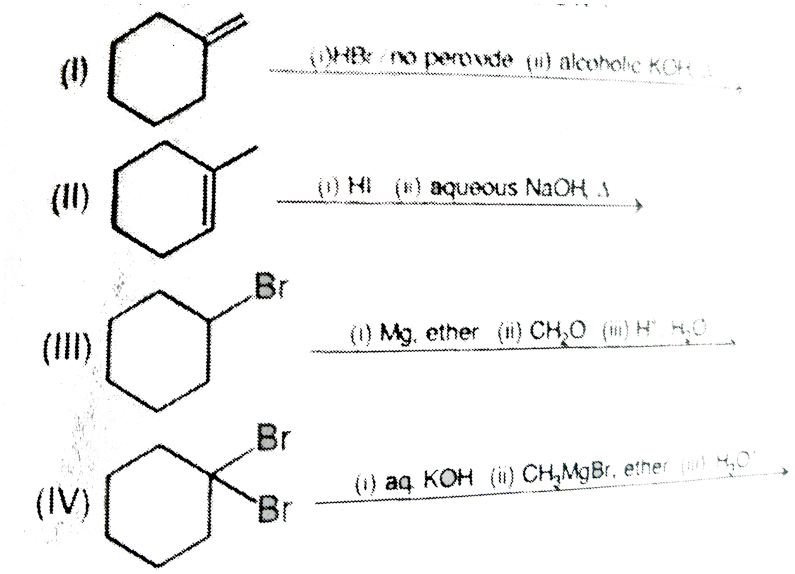
14. Four processes are indicated below :



The processes that do not produce 1-methylcyclohexanol are

A. II , IV

B. I, II

C. III, IV

D. I, III

Answer: D

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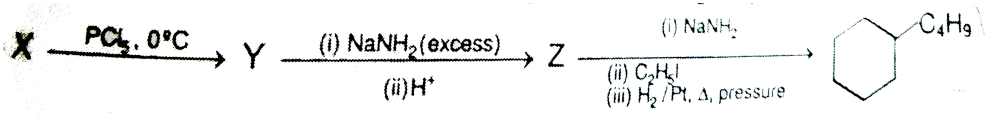
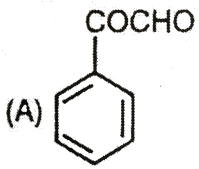
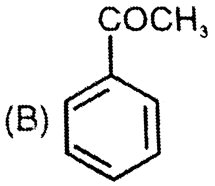
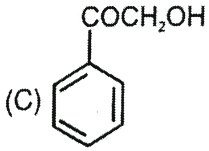
15. n-Butylcyclohexane is formed through the following sequence of reactions.

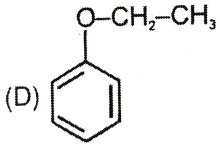


In the above scheme of reactions, "X" is -

A. 

B. 

C. 

D. 

Answer: B

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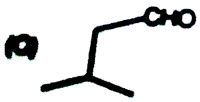
16. An alkyl halide (X) on reaction with ethanolic sodium hydroxide forms an alkene (Y) which on further reaction with HBr gives the same alkyl halide.The alkene (Y) on reaction with HBr/ peroxide followed by reaction with Mg metal followed by reaction with HCN produces an aldehyde (Z).Z is :

A. 

B. 

C. 

D. 

Answer: B::C

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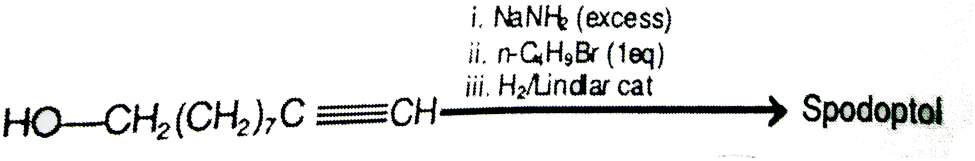
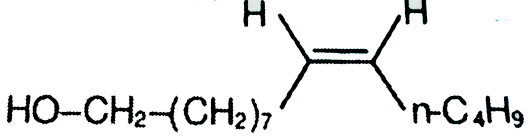
17. Spodoptol, a sex attractant, produced by a female fall armyworm moth, can be prepared as follows. The structure of Spodoptol is (pK_a : terminal alkynes ~ 25, alcohols ~ 17)



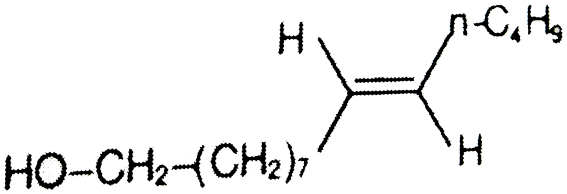
A. $n - C_4H_9 - O - CH_2 - (CH_2)_7 - HC = CH_2$

(B)



B.

(C)



C.

D. $HO-CH_2-(CH_2)_{12}-CH_3$

Answer: B

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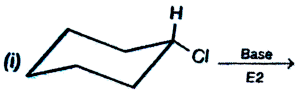
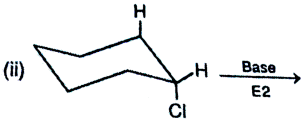
APSP PART-3

1. Rate of Bimolecular elimination (E2) reaction for the following :





A. Same for both conformers

B. I gt II

C. ii gt I

D. Can't say anything about rate of E-2 reaction

Answer: C

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2. Which is incorrect about alkyl bromide having molecular formula $C_5H_{11}Br$

A. Only one isomeric alkyl bromide undergoes E1 elimination at the fastest rate

B. Only one is incapable of reacting by the E2 mechanism

C. Only one isomer gives a single alkene on E2 elimination

D. 2-Bromopentane gives the most complex mixture of alkenes on E2 elimination

Answer: C

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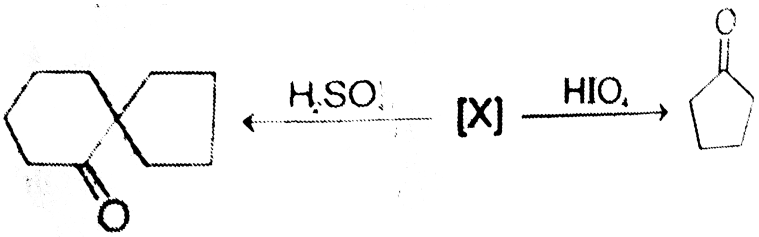
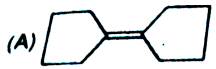
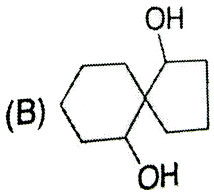
3. The compound 'X' is



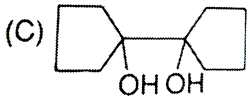
A.

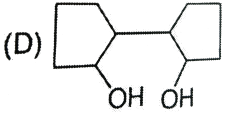


B.



C.



D. 

Answer: C

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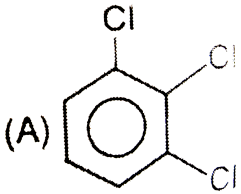
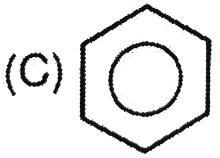
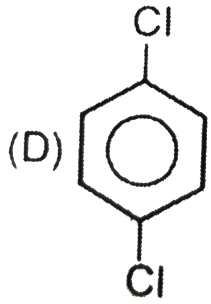
4. When the all-cis isomer of $C_6H_6Cl_6$ (1,2,3,4,5,6 -Hexachlorohexane) is heated with alc. KOH, the most probable product is :

A. 

B.

C. 

D. 

Answer: B

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5. $CH_2O \xrightarrow[H_3O^{\oplus}]{CHD_2MgI} X \xrightarrow[\Delta]{Conc.H_2SO_4} Y$

In the above reaction compound X & Y respectively will be

A. $\overset{OH}{\overset{|}{C}}HD - CH_2 - OH, CHO - CHO$

B. $CHD_2 - CH_2 - OH, CHO - CHO$

C. $CHD_2 - CH_2 - OH, CD_2 = CH_2$

D. $\underset{OH}{\overset{|}{C}}HD - CH_2 - OH, CD_2 = CD_2$

Answer: C

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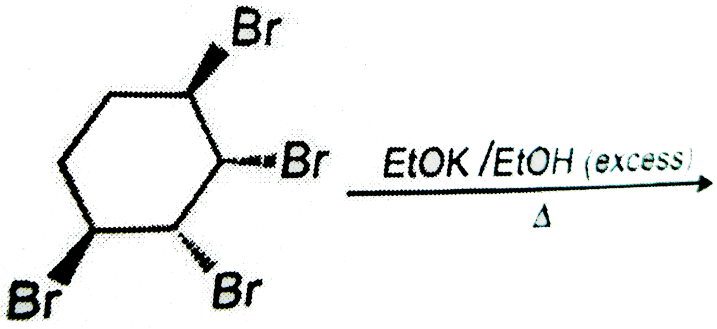
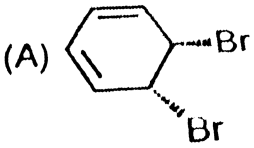
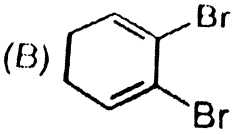
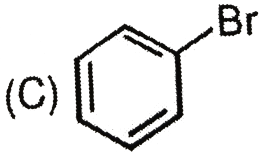
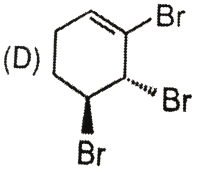
6. Major product of the given reaction is :



A. 

B. 

C. 

D. 

Answer: C

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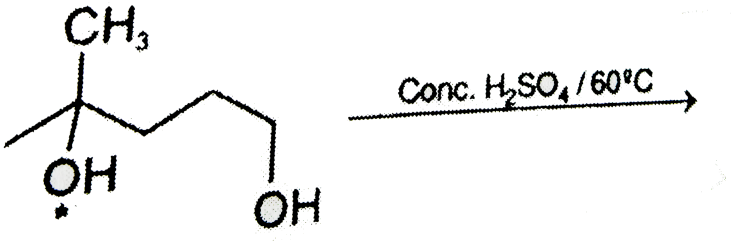
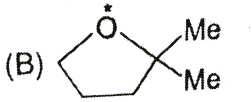
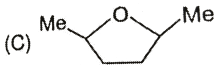
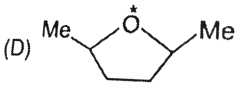
7. 

The product is -

A. 

B. 

C. 

D. 

Answer: A

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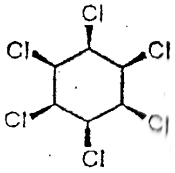
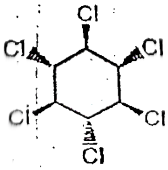
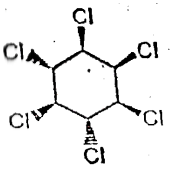
8. Which one of the following hyxachlorocyclohexane is least reactive and which one is most reactive in $E2$ reactions with a strong base fro dehydrohalogenation.



I



II



III

A. I least & II least

B. II least & I most

C. III least & I most

D. III least & II most

Answer: B

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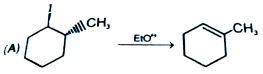
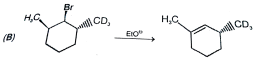
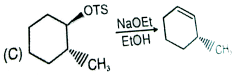
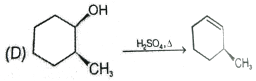
9. In which of the following reactions the correct major products are mentioned

A. 

B. 

C. 

D. 

Answer: B::C

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10. When ethyl bromide is added to potassium t-butoxide, the product is ethyl t-butyl ether.

$$\underset{\text{ethyl bromide}}{CH_3CH_2-Br}+\underset{\text{ptassium t-butoxide}}{(CH_3)_3C-OK}\rightarrow\underset{\text{ethyl t-butyl}}{(CH_3)_3C-O-}\underset{\text{ether}}{CH_2CH_3}$$

Which of the following statements is/are correct ?

A. when the concentration of Ethyl bromide is doubled rate is also doubled.

B. when the concentration of potassium t-butoxide is tripled and the concentration of ethyl bromide is doubled rate will increases six times.

C. Elimination product dominates when temperature is raised.

D. when the concentration of potassium t-butoxide is tripled and the concentration of ethyl bromide is doubled rate will increase three times.

Answer: A::B::C

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11. Which of the following statement are true ?

A. Bridgehead halide are inert for both S_N1 and S_N2 reaction.

B. The fist step in both S_N1 and E1 reaction is same

C. S_N2 reaction proceed with total retention of configuration .

D. E2 elimination are favoured by weak base

Answer: A::B

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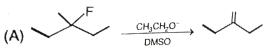
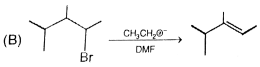
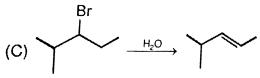
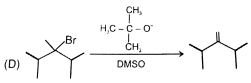
12. Which of the following reaction has the correct major product .

A. 

B. 

C. 

D. 

Answer: A::B::D

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13. Which of the following statements is/are correct for alkyl halide ?

A. In most unimolecular reactions of alkyl halide S_N1 reactions is favoured over E1 reaction

B. E1 mechanism is favoured as compared to S_N1 mechanism by branching at β carbon.

C. In unimolecular reaction, increasing the temperature favours E1 mechanism

D. E1 reactions are favoured by the use of weak bases and by the use of polar solvents.

Answer: A::B::C::D

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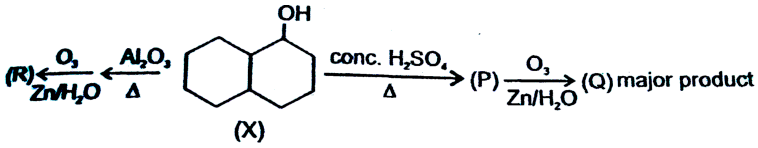
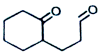
14. The correct statements about the following reaction are



[Hint: Al_2O_3 gives satyzeff's product without any rearrangement]

A. (A) The product P is 

B. (B) The product Q is 

C. (C) The product R is 

D. (D) The compound  gives product (P) on treatment with conc. H_2SO_4 as well as with Al_2O_3 a

Answer: B::D

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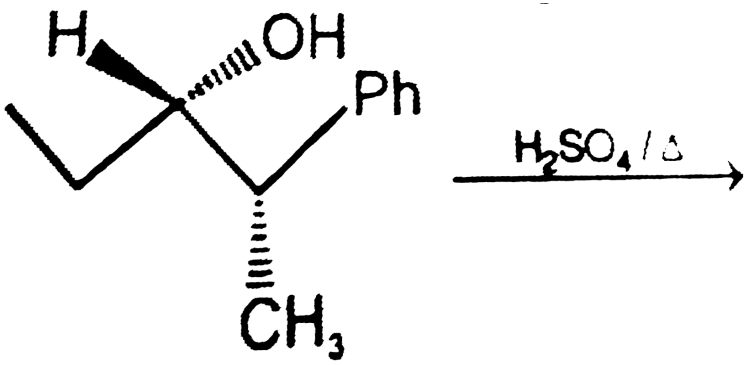
15. The order of following reaction is :



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16. Total number of alkenes obtained by dehydration of 3,4-diethylhexan-2-ol in acidic medium ?

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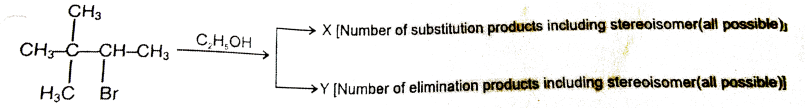
17. 

Report your answer as XY

Report your answer as XY

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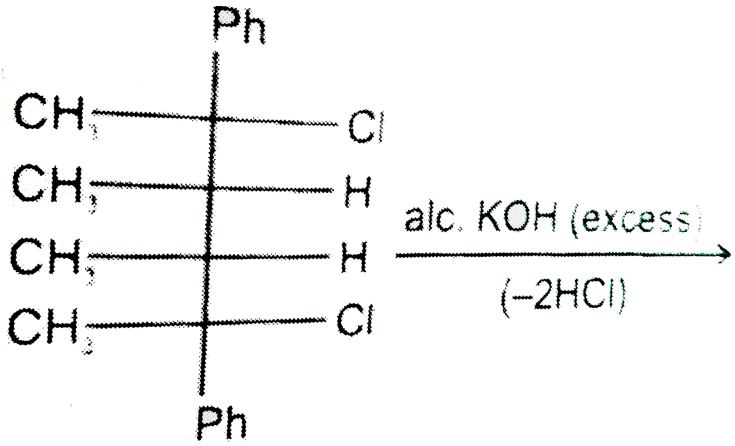
18. The number of products (stereoisomers) formed in the following reaction is (consider only major product)



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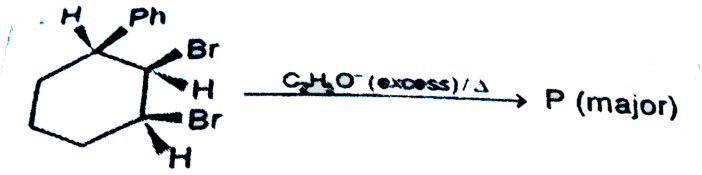
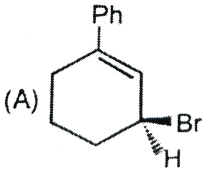
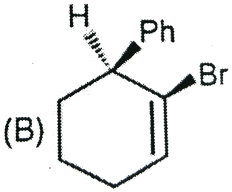
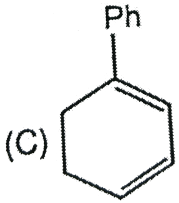
19. The elimination reactions mainly involve three mechanism E1,E2 and E1cB. If the leaving group departs before β-proton (H^{Θ} ion) then it is E1 mechanism. If proton is taken off first before leaving group it is E1cB mechanism.The pure E2 involves both β-Hydrogen and leaving group departing simutaneously. If acidity of β-Hydrogen increases and leaving group ability decreases then E1cB mechanism increases.

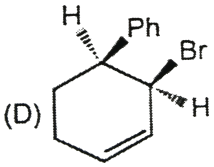


Product P is

A. 

B. 

C. 

D. 

Answer: C

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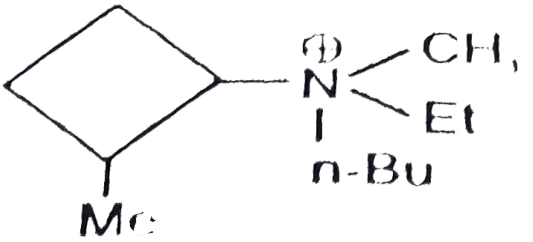
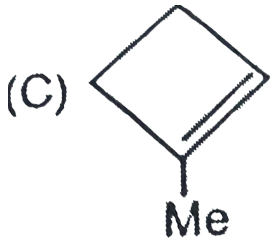
20. The elimination reactions mainly involve three mechanism E1,E2 and E1cB. If the leaving group departs before β-proton (H^{Θ} ion) then it is E1 mechanism. If proton is taken off first before leaving group it is E1cB mechanism.The pure E2 involves both β-Hydrogen and leaving group departing simutaneously. If acidity of β-Hydrogen increases and leaving group ability decreases then E1cB mechanism increases.

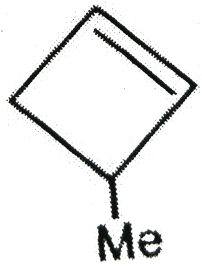


The alkene formed as a major product in the above elimination reaction is

A. $CH_2 = CH_2$

B. $CH_3 - CH_2 - CH = CH_2$

C. 

(D) 

D.

Answer: A

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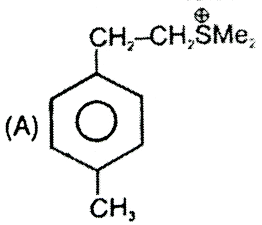
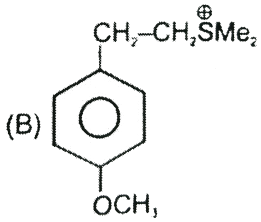
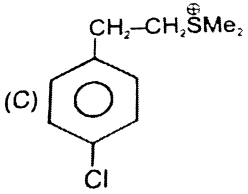
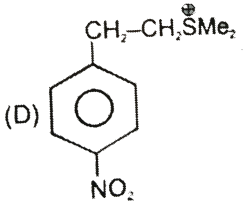
21. The elimination reactions mainly involve three mechanism E1,E2 and E1cB. If the leaving group departs before β-proton ($H^t = \Theta$ ion) then it is E1 mechanism. If proton is taken off first before leaving group it is E1cB mechanism.The pure E2 involves both β-Hydrogen and leaving group departing simutaneously. If acidity of β-Hydrogen increases and leaving group ability decreases then E1cB mechanism increases.

Which of the following substrate will undergo fastest reaction through E1cB route

A. 

B. 

C. 

D. 

Answer: D

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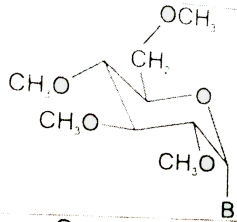
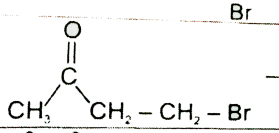
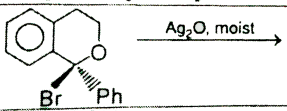
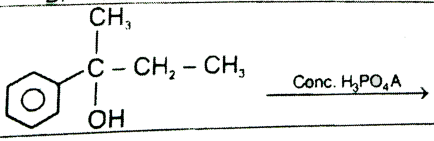
22. Match List I (Reaction) with List II (Type of reaction) and select the correct answer using the code given below the lists :

List I		List II	
(P)		(1)	E1
(Q)		(2)	E2
(R)		(3)	E1cB
(S)		(4)	SN1

A. $\begin{matrix} P & Q & R & S \\ 1 & 3 & 4 & 2 \end{matrix}$

B. $\begin{matrix} P & Q & R & S \\ 3 & 4 & 2 & 1 \end{matrix}$

C. $\begin{matrix} P & Q & R & S \\ 1 & 3 & 2 & 4 \end{matrix}$

D. $\begin{matrix} P & Q & R & S \\ 2 & 3 & 4 & 1 \end{matrix}$

Answer: D

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