Additional Problems for Self Practice (APSP)

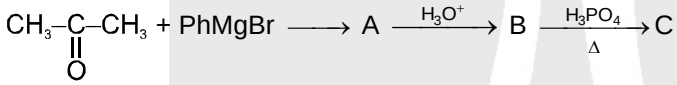
This Section is not meant for classroom discussion. It is being given to promote self-study and self testing amongst the Resonance students.

PART - I : PRACTICE TEST-1 (IIT-JEE (MAIN Pattern))

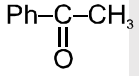
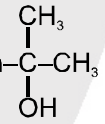
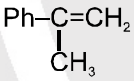
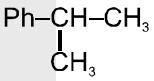
Max. Time : 1 Hr. **Max. Marks : 120**

Important Instructions

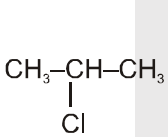
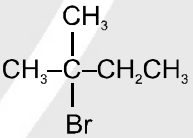
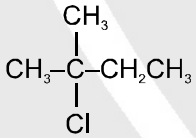
1. The test is of **1 hour** duration.
2. The Test Booklet consists of **30** questions. The maximum marks are **120.**
3. Each question is allotted **4 (four)** marks for correct response.
4. Candidates will be awarded marks as stated above in Instructions No. 3 for correct response of each question. **¼ (one fourth)** marks will be deducted for indicating incorrect response of each question. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
5. There is only one correct response for each question. Filling up more than one response in any question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instructions 4 above.

1. 

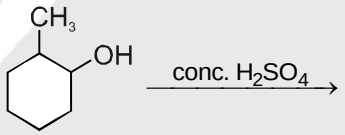
C is :

(1)  (2)  (3)  (4) 

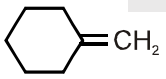
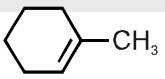
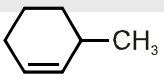
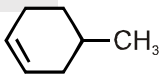
2. The correct increasing order of reactivity for following alkyl halides towards elimination reaction with alcoholic KOH is :

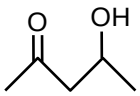
(I)  (II)  (III) 

(1) II > I > III (2) I > II > III (3) II > III > I (4) III > II > I

3. In the given reaction:  [X] as major product

[X] will be :

(1)  (2)  (3)  (4) 

4.  (Product)

The major product of the above reaction is obtained by mechanism

(1) S_N2 (2) E2 (3) E1cB (4) S_N1

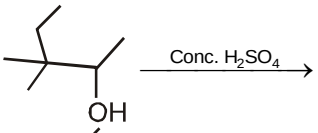
5. Select the incorrect option for the following statements.

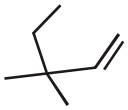
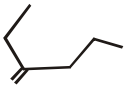
(1) Bimolecular elimination of alkyl halides is a stereospecific reaction.

(2) In S_N2 reaction a single isomer is the only product.

(3) Alcohol dehydrate in strongly basic conditions by E1 mechanism.

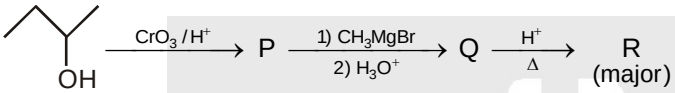
(4) 3-hydroxypropanal dehydrates in strong basic condition by E1cb mechanism.

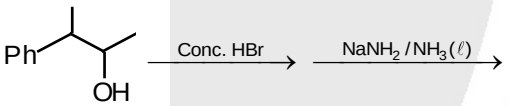
6.  Major product is :

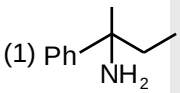
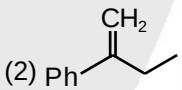
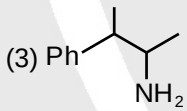
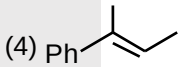
(1) 
(2) 
(3) 
(4) 

7. Which of the following conformations of meso 2,3-dibromobutane will give bromoalkene with alcoholic KOH ?
(1) Gauche form
(2) Anti form
(3) Partial eclipsed form
(4) Fully eclipsed form

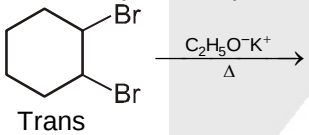
8. 2-Bromopentane is heated with potassium ethoxide in ethanol. The major product obtained is
(1) 2-Ethoxypentane
(2) pent-1-ene
(3) cis-pent-2-ene
(4) trans-pent-2-ene

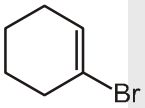
9. 
R is :
(1) But-1-ene
(2) 2-methylbut-1-ene
(3) 2-methylbut-2-ene
(4) 2-methyl propene

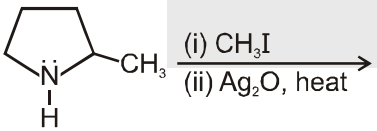
10.  Major product is :

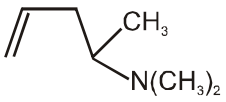
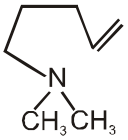
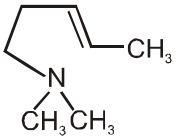
(1) 
(2) 
(3) 
(4) 

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


Trans

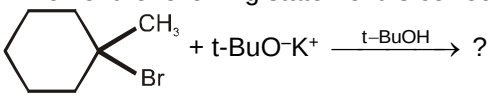
(1) 
(2) 
(3) 
(4) 

12. 

(1) 
(2) 
(3) 
(4) None

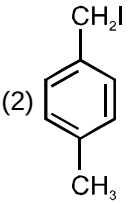
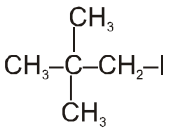
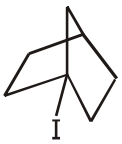
13. Which statement is false for elimination reaction.
(1) β-elimination is more common than α & γ elimination
(2) Inβ-elimination, formation of multiple bond occur.
(3) β-elimination may be E1, E2 or E1cB.
(4) E1 & E2 requires presence of poor leaving group but E1cB requires presence of good leaving group.

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

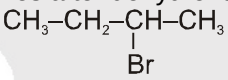


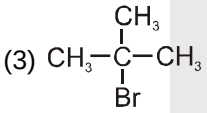
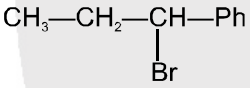
(1) Major product is endocyclic alkene formed according to Saytzeff.
(2) Major product is exocyclic alkene formed according to Saytzeff.
(3) Major product is exocyclic alkene formed according to Hoffmann.
(4) Major product is endocyclic alkene formed according to Hoffmann.

15. Substrate that show E1 reaction

(1) CH_3CH_2I (2)  (3)  (4) 

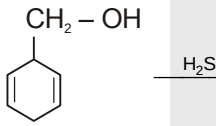
16. Which of the following compound will give three alkenes after dehydrohalogenation.

(1) $CH_3–CH_2–CH_2–CH_2–Br$ (2) 

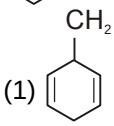
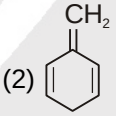
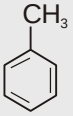
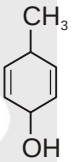
(3)  (4) 

17. 

The product is :
(1) $PhSO_2CH=CH_2$ (2) $CH_2=CH–OMe$
(3) $PhSO_2CH_2–CD_2OMe$ (4) $CD_2=CH_2$

18. 

A. The product A is :

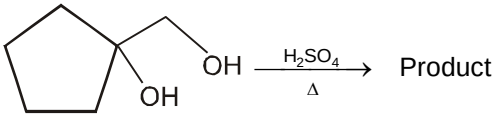
(1)  (2)  (3)  (4) 

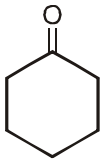
19. Typical features of E2 involve :
(1) Two step reaction
(2) Second step is the rate determining step
(3) Anti-periplanar transition state
(4) Formation of a carbanion intermediate, stabilized by conjugation with a strong –M group

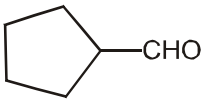
20. An alkyl chloride produces a single alkene on reaction with sodium ethoxide and ethanol. The alkene further undergoes hydrogenation to yield-2-methylbutane. Identify the alkyl chloride from amongst the following :
(1) $ClCH_2C(CH_3)_2CH_3$ (2) $ClCH_2CH_2CH_2CH_3$
(3) $ClCH_2CH(CH_3)CH_2CH_3$ (4) $CH_3C(Cl)(CH_3)CH_2CH_3$

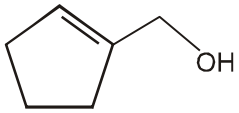
21. Relative ease of dehydration of alcohol follows which general order
(1) $3^o > 2^o > 1^o$ alc. (2) $1^o > 2^o > 3^o$ alc (3) $2^o > 3^o > 1^o$ alc (4) $3^o > 1^o > 2^o$ alc

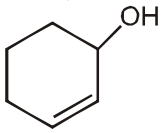
22. Which of the following is the correct major product for given reaction ?



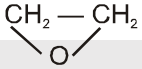
(1) 

(2) 

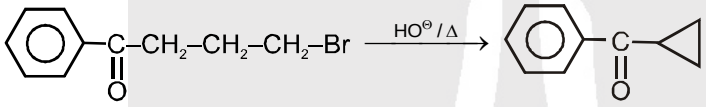
(3) 

(4) 

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

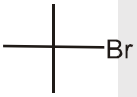
(1) $HO–CH_2–CH_2–Br \xrightarrow{NaOH/\Delta}$ 

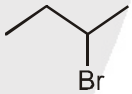
(2) $CHCl_3 + KOH \xrightarrow{\Delta} CCl_2$

(3) 

(4) $CH_2=CH–Cl \xrightarrow{NaNH_2} HC\equiv CH$

24. Correct order of E_2/S_N2 ratio is :

P = 

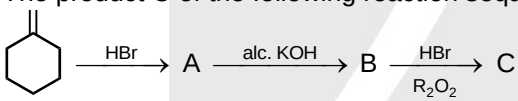
Q = 

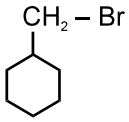
R = $CH_3–Br$

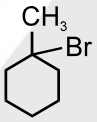
S = $CH_3–CH_2–Br$

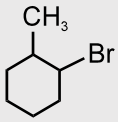
(1) P > Q > S > R (2) P > Q > R > S (3) R > S > Q > P (4) P > S > Q > R

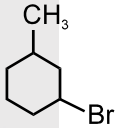
25. The product C of the following reaction sequence is :



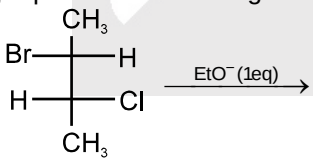
(1) 

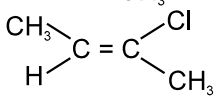
(2) 

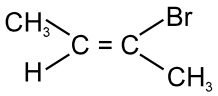
(3) 

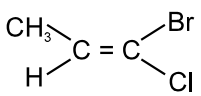
(4) 

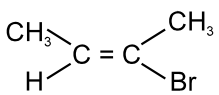
26. The major product of following reaction is



(1) 

(2) 

(3) 

(4) 

27. What is the correct sequence of reagent/s for the following conversion:

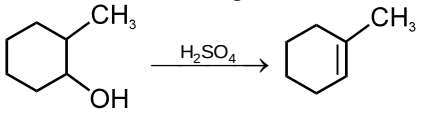
(1) $\xrightarrow{\text{alc. KOH}} \xrightarrow{HI}$

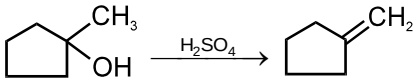
(2) $\xrightarrow{\text{aq. KOH}} \xrightarrow[\Delta]{H_2SO_4} \xrightarrow{HI}$

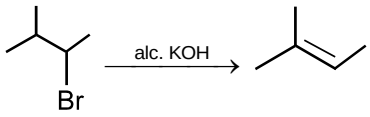
(3) $\xrightarrow{\text{alc. KOH}} \xrightarrow{HBr / R_2O_2} \xrightarrow[\text{acetone}]{KI}$

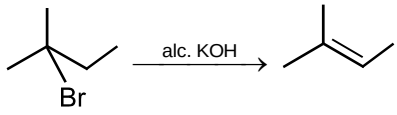
(4) $\xrightarrow{\text{alc. KOH}} \xrightarrow{HCl} \xrightarrow[\text{acetone}]{KI}$

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

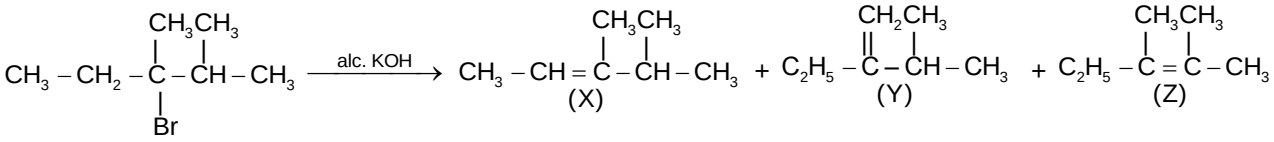
(1) 

(2) 

(3) 

(4) 

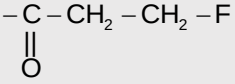
29. In the following reaction the correct order of percentage of products X, Y and Z is



(1) X > Y > Z (2) Z > Y > X (3) Z > X > Y (4) Y > Z > X

30. The rate of elimination is fastest in

(1) Ph–CH_2–CH_2–F

(2) 

(3) Ph–O–CH_2–CH_2–F

(4) CH_3–CH_2–CH_2–F

Practice Test-1 ((IIT-JEE (Main Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

Que.	1	2	3	4	5	6	7	8	9	10
Ans.										
Que.	11	12	13	14	15	16	17	18	19	20
Ans.										
Que.	21	22	23	24	25	26	27	28	29	30
Ans.										

PART - II : NATIONAL STANDARD EXAMINATION IN CHEMISTRY (NSEC) STAGE-I

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 identity of the alkylbromide? **[NSEC-2000]**

(A) 1-bromo-2-methylbutane (B) 1-bromobutane
(C) 1-bromo-2, 2-dimethylpropane (D) 2-bromo-2-methylbutane

2. Which of the following most readily undergoes E2 elimination with a strong base ? **[NSEC-2000]**

(A) 2-bromopentane (B) 2-bromo-2-methylbutane
(C) 1-bromo-2, 2-dimethylpropane (D) 2-bromo-3-methylbutane

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 : **[NSEC-2001]**

(A) $ClCH_2CH(CH_3)CH_2CH_3$ (B) $ClCH_2CH_2CH_2CH_3$
(C) $ClCHC(CH_3)_2CH_3$ (D) $CH_3C(Cl)(CH_3)CH_2CH_3$

4. On heating glycerol with conc. H_2SO_4, a compound obtained which has an unpleasant odour. This compound is : **[NSEC-2001, 2004]**

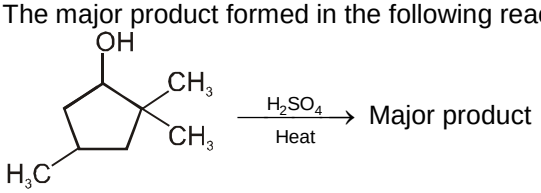
(A) ethylene glycol (B) allyl alcohol (C) acrolein (D) glycerol sulphate

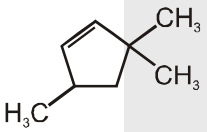
5. n-Propylbromide and ethanolic potassium hydroxide react to give : **[NSEC-2001]**
(A) propyne (B) propene (C) propane (D) propanol

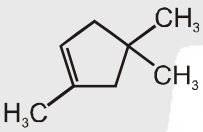
6. The peroxide effect occurs by : **[NSEC-2001]**
(A) ionic mechanism (B) heterolytic fission of double bond
(C) homolytic fission of double bond (D) free radical mechanism

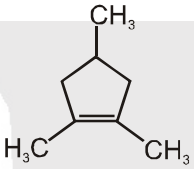
7. Acid catalysed dehydration of 2-pentanol would give **[NSEC-2006]**
(A) 1-pentene as a major product (B) cis 2-pentene as a major product
(C) trans-2-pentene as a major product (D) cis- and trans-2-pentene in equal amount.

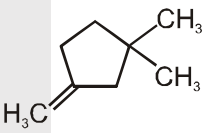
8. The major product formed in the following reaction is : **[NSEC-2007]**



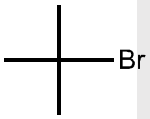
(A) 

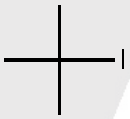
(B) 

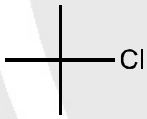
(C) 

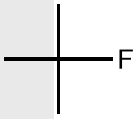
(D) 

9. Arrange the following compounds in order of decreasing reactivity in the elimination (bimolecular) reaction with C_2H_5ONa **[NSEC-2007]**

(i) 

(ii) 

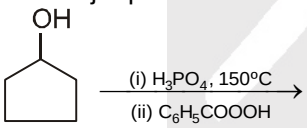
(iii) 

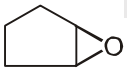
(iv) 

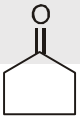
(A) II > I > III > IV (B) IV > III > I > II (C) III > I > II > IV (D) I > III > IV > II

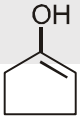
10. Compound X on treatment with HI gives Y. Y on treatment with ethanolic KOH gives Z (an isomer of X). Ozonolysis of Z (with H_2O_2 workup) gives a two-carbon carboxylic acid and four carbon ketone. Hence, X is :
(A) 2-methyl-2-pentene (B) 4-methyl-1-pentene **[NSEC-2009]**
(C) 2, 3-dimethyl-2-butene (D) 3-methyl-1-pentene

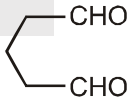
11. The major product of the following reaction is : **[NSEC-2009]**

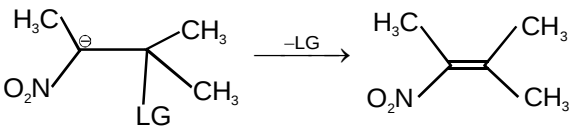


(A) 

(B) 

(C) 

(D) 

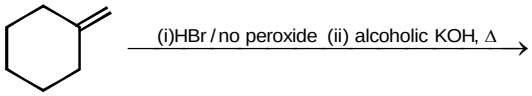
12. 

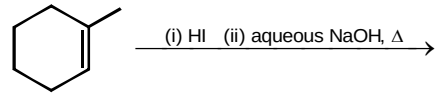
[NSEC-2013]

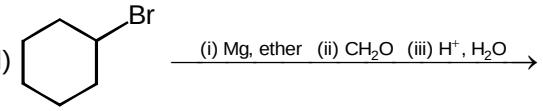
The carbanion expels a leaving group LG to yield an alkene as shown above by
(A) E1cB mechanism (B) E1 mechanism
(C) E2 mechanism (D) Such a reaction does not take place

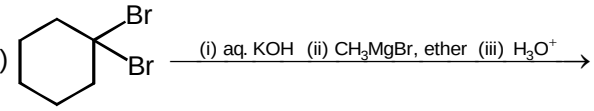
13. The compound that is most reactive with alcoholic KOH is **[NSEC-2014]**
(A) CH_2=CH–Br (B) CH_3CH_2Br (C) $(CH_3)_2CH$–Br (D) $CH_3COCH_2CH_2Br$

14. Four processes are indicated below : **[NSEC-2015]**

(I) 

(II) 

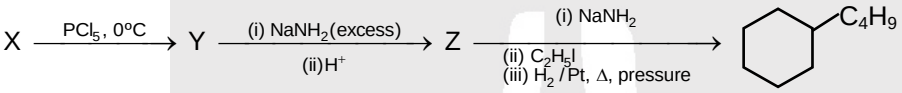
(III) 

(IV) 

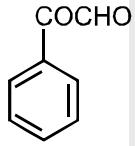
The processes that do not produce 1-methylcyclohexanol are

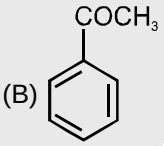
(A) II, IV (B) I, II (C) III, IV (D) I, III

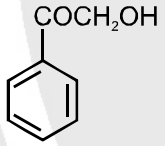
15. n-Butylcyclohexane is formed through the following sequence of reactions.

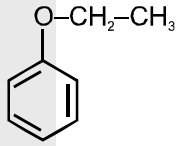


In the above scheme of reactions, "X" is – **[NSEC-2015]**

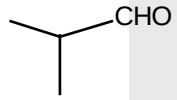
(A) 

(B) 

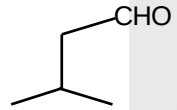
(C) 

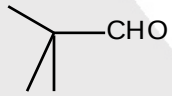
(D) 

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 : **[NSEC-2016]**

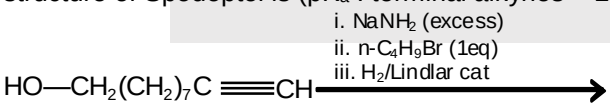
(A) 

(B) 

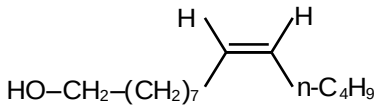
(C) 

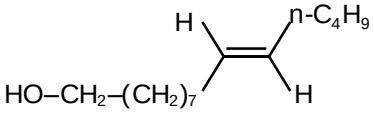
(D) 

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) **[NSEC-2016]**



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

(B) 

(C) 

(D) HO–CH_2–$(CH_2)_{12}$–CH_3

PART - III : PRACTICE TEST-2 (IIT-JEE (ADVANCED Pattern))

Max. Time : 1 Hr. **Max. Marks : 66**

Important Instructions

A. General :

1. The test is of 1 hour duration.
2. The Test Booklet consists of 22 questions. The maximum marks are 66.

B. Question Paper Format :

3. Each part consists of five sections.
4. Section 1 contains 8 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE is correct.
5. Section 2 contains 6 multiple choice questions. Each question has four choices (A), (B), (C) and (D) out of which ONE OR MORE THAN ONE are correct.
6. Section 3 contains 4 questions. The answer to each of the questions is a single-digit integer, ranging from 0 to 9 (both inclusive).
7. Section 4 contains 1 paragraphs each describing theory, experiment and data etc. 3 questions relate to paragraph. Each question pertaining to a partcular passage should have only one correct answer among the four given choices (A), (B), (C) and (D).
8. Section 5 contains 1 multiple choice questions. Question has two lists (list-1 : P, Q, R and S; List-2 : 1, 2, 3 and 4). The options for the correct match are provided as (A), (B), (C) and (D) out of which ONLY ONE is correct.

C. Marking Scheme

9. For each question in Section 1, 4 and 5 you will be awarded 3 marks if you darken the bubble corresponding to the correct answer and zero mark if no bubble is darkened. In all other cases, minus one (–1) mark will be awarded.
10. For each question in Section 2, you will be awarded 3 marks. If you darken all the bubble(s) corresponding to the correct answer(s) and zero mark. If no bubbles are darkened. No negative marks will be answered for incorrect answer in this section.
11. For each question in Section 3, you will be awarded 3 marks if you darken only the bubble corresponding to the correct answer and zero mark if no bubble is darkened. No negative marks will be awarded for incorrect answer in this section.

SECTION-1 : (Only One option correct Type)

This section contains 8 multiple choice questions. Each questions has four choices (A), (B), (C) and (D) out of which Only ONE option is correct.

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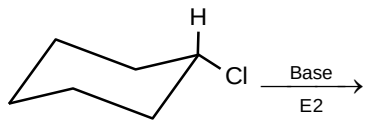
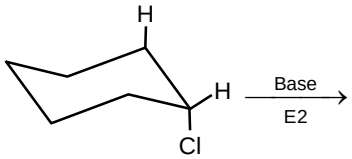
1. Rate of Bimolecular elimination (E2) reaction for the following :

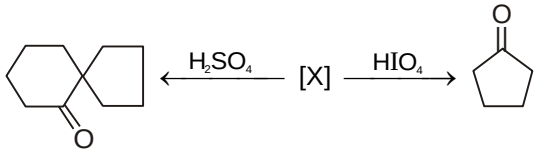
(i) 

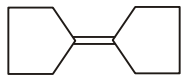
(ii) 

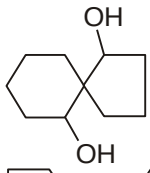
(A) Same for both conformers
(B) i > ii
(C) ii > i
(D) Can't say anything about rate of E-2 reaction

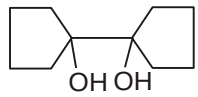
2. Which is incorrect about alkyl bromide having molecular formula $C_5H_{11}Br$
(A) One isomeric alkyl bromide undergoes E1 elimination at the fastest rate
(B) Only one is incapable of reacting by the E2 mechanism
(C) Only one isomer gives a single alkene on E2 elimination
(D) 2-Bromopentane gives the most complex mixture of alkenes on E2 elimination

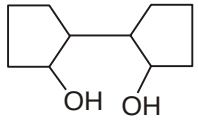
3. The compound 'X' is



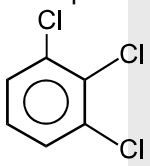
(A) 

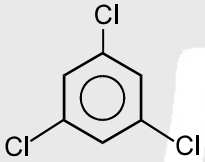
(B) 

(C) 

(D) 

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

(A) 

(B) 

(C) 

(D) 

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

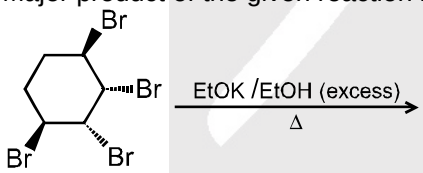
(A) $\overset{OH}{\underset{|}{CHD}} - CH_2 - OH$, CHO–CHO

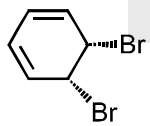
(B) $CHD_2–CH_2–OH$, CHO–CHO

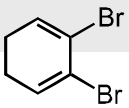
(C) $CHD_2–CH_2–OH$, $CD_2=CH_2$

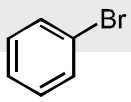
(D) $\overset{CHD - CH_2 - OH}{\underset{|}{OH}}$, $CD_2=CH_2$

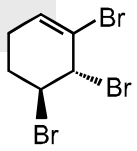
6. Major product of the given reaction is :

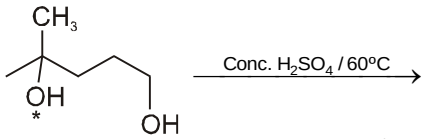


(A) 

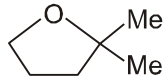
(B) 

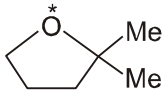
(C) 

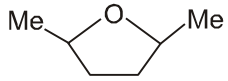
(D) 

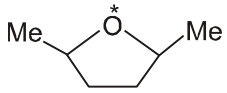
7. 

The product is –

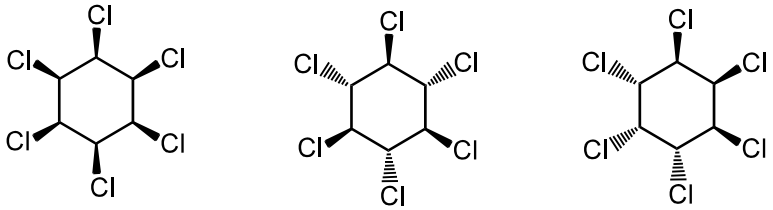
(A) 

(B) 

(C) 

(D) 

8. Which one of the following hexachlorocyclohexane is least reactive and which one is most reactive for E2 reactions with a strong base for dehydrohalogenation.



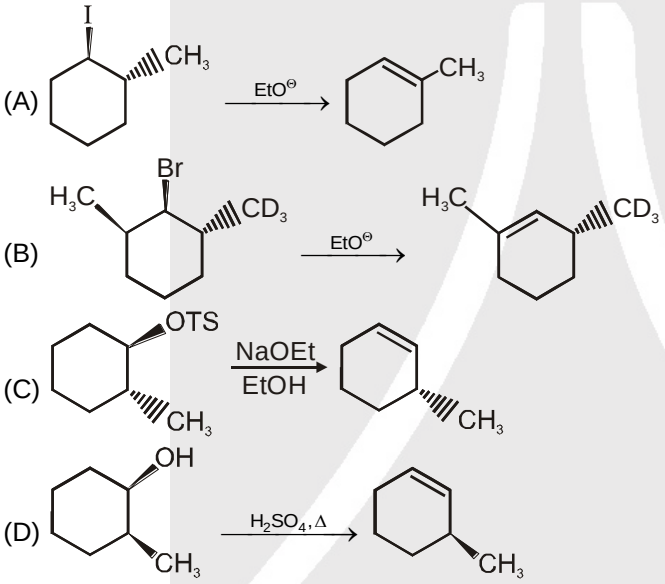
I II III

(A) I least & II most (B) II least & I most (C) III least & I most (D) III least & II most

Section-2 : (One or More than one options correct Type)

This section contains 6 multipole choice questions. Each questions has four choices (A), (B), (C) and (D) out of which ONE or MORE THAN ONE are correct.

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



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

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

Which of the following statement(s) 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 increase 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.

11. Which of the following statement are true ?

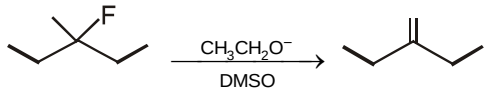
(A) Bridgehead halide are inert for both S_N1 and S_N2 reaction.

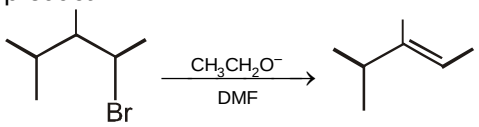
(B) The first step in both S_N1 and E1 reaction is same.

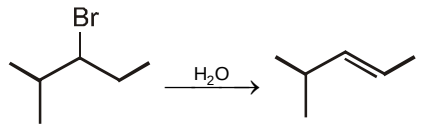
(C) S_N2 reaction proceed with total retention of configuration.

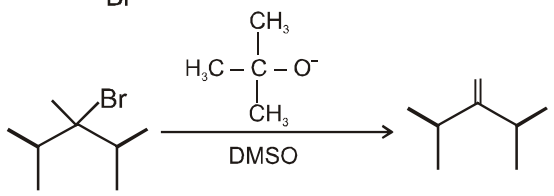
(D) E2 elimination are favoured by weak base

12. Which of the following reactions represent the major product.

(A) 

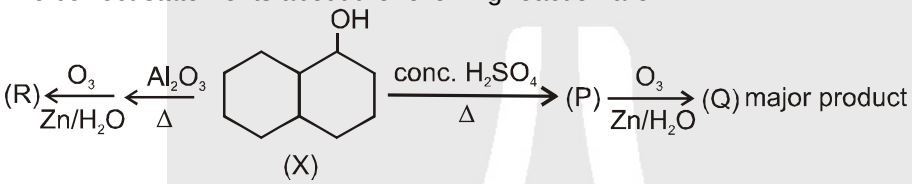
(B) 

(C) 

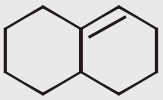
(D) 

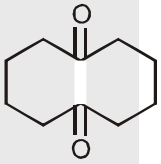
13. Which of the following statements is/are correct for alkyl halide ?
(A) In most unimolecular reactions of alkyl halide S_N1 reaction is favoured over E1 reaction.
(B) E1 mechanism is favoured as compared to S_N1 mechanism by branching at β carbon
(C) In unimolecular reaction, increasing the temperature favours E1 mechanism
(D) E1 reactions are favoured by the use of weak bases and by the use of polar solvents.

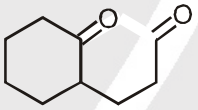
14. The correct statements about the following reaction are

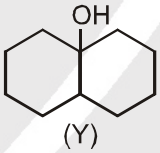


[Hint : Al_2O_3 gives saytzeff's product without any rearrangment]

(A) The product P is 

(B) The product Q is 

(C) The product R is 

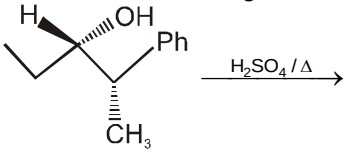
(D) The compound 

gives product (P) on treatment with conc. H_2SO_4 as well as with Al_2O_3/Δ

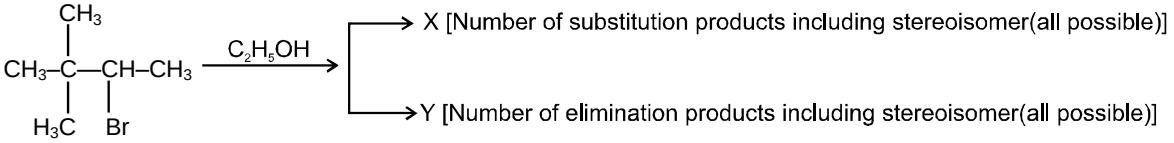
Section-3 : (One Integer Value Correct Type.)

This section contains 4 questions. Each question, when worked out will result in one integer from 0 to 9 (both inclusive)

15. The order of following reaction is :

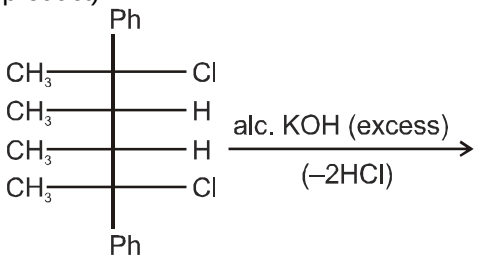


16. Total number of alkenes obtained by dehydration of 3,4-diethylhexan-2-ol in acidic medium ?

17. 

Report your answer as XY

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



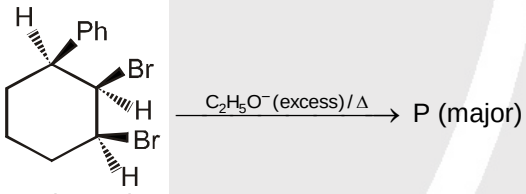
SECTION-4 : Comprehension Type (Only One options correct)

This section contains 1 paragraphs, each describing theory, experiments, data etc. 3 questions relate to the paragraph. Each question has only one correct answer among the four given options (A), (B), (C) and (D)

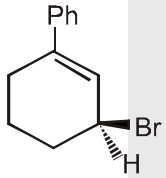
Paragraph for Questions 19 to 21

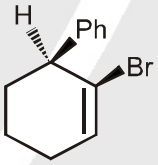
The elimination reactions mainly involve three mechanism E1, E2, E1cB. If the leaving group departs before β-proton ($H^{\oplus}$ ion) then it is E1 mechanism, If proton is taken off first before leaving group it is E1cB mechanism. The pure E2 involves both β-Hydrogen and leaving group departing simutaneously.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

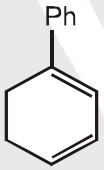
19.

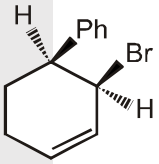


Product P is

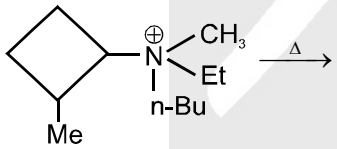
(A) 

(B) 

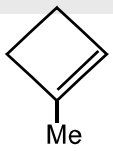
(C) 

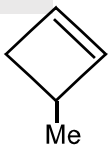
(D) 

20.

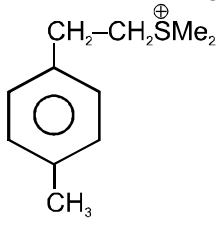


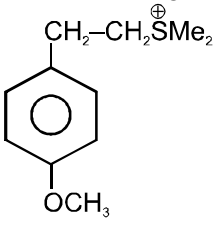
The alkene formed as a major product in the above elimination reaction is

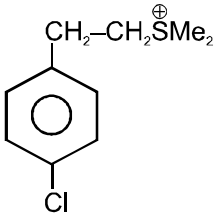
(A) $CH_2=CH_2$ (B) $CH_3–CH_2–CH=CH_2$ (C) 

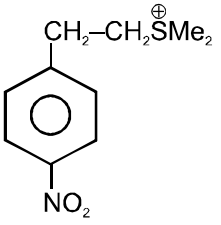
(D) 

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

(A) 

(B) 

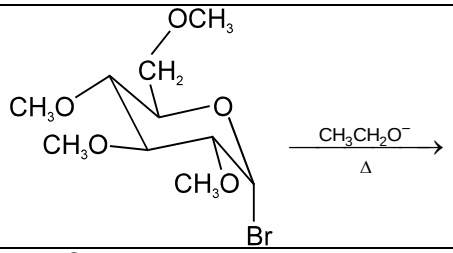
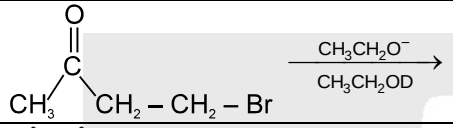
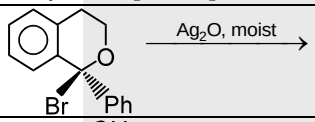
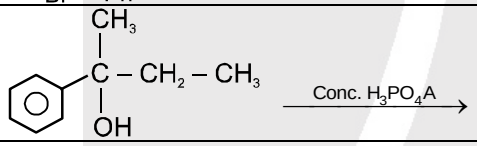
(C) 

(D) 

SECTION-5 : Matching List Type (Only One options correct)

This section contains 1 questions, each having two matching lists. Choices for the correct combination of elements from List-I and List-II are given as options (A), (B), (C) and (D) out of which one is correct

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)	S_N1

Codes :

	P	Q	R	S		P	Q	R	S
(A)	1	3	4	2	(B)	3	4	2	1
(C)	1	3	2	4	(D)	2	3	4	1

Practice Test-2 ((IIT-JEE (ADVANCED Pattern))

OBJECTIVE RESPONSE SHEET (ORS)

Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Ans.										
Que.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.										
Que.	**21**	**22**								
Ans.										

APSP Answers

PART - I

1.	(3)	**2.**	(3)	**3.**	(2)	**4.**	(3)	**5.**	(3)
6.	(3)	**7.**	(1)	**8.**	(4)	**9.**	(3)	**10.**	(4)
11.	(3)	**12.**	(2)	**13.**	(4)	**14.**	(3)	**15.**	(3)
16.	(2)	**17.**	(1)	**18.**	(3)	**19.**	(3)	**20.**	(3)
21.	(1)	**22.**	(2)	**23.**	(4)	**24.**	(1)	**25.**	(3)
26.	(1)	**27.**	(3)	**28.**	(2)	**29.**	(3)	**30.**	(2)

PART - II

1.	(A)	**2.**	(B)	**3.**	(A)	**4.**	(C)	**5.**	(B)
6.	(D)	**7.**	(C)	**8.**	(C)	**9.**	(A)	**10.**	(D)
11.	(A)	**12.**	(A)	**13.**	(D)	**14.**	(D)	**15.**	(B)
16.	(BC)	**17.**	(B)						

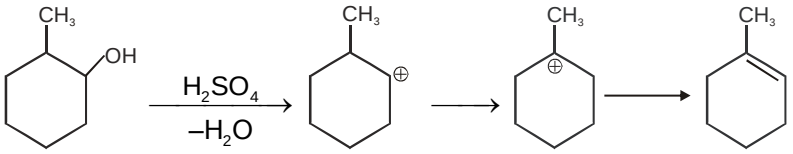
PART - III

1.	(C)	**2.**	(C)	**3.**	(C)	**4.**	(B)	**5.**	(C)
6.	(C)	**7.**	(A)	**8.**	(B)	**9.**	(BC)	**10.**	(ABC)
11.	(AB)	**12.**	(ABD)	**13.**	(ABCD)	**14.**	(BD)	**15.**	1
16.	5	**17.**	33	**18.**	1	**19.**	(C)	**20.**	(A)
21.	(D)	**22.**	(D)						

APSP Solutions

PART - I

3.



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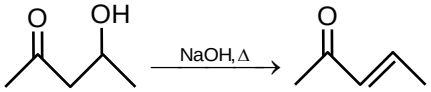
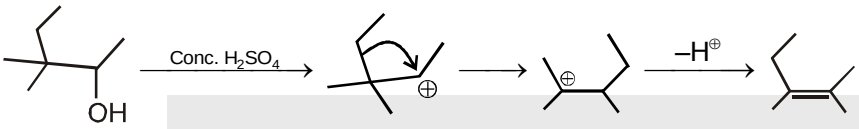


(E1cB mechanism)

6.



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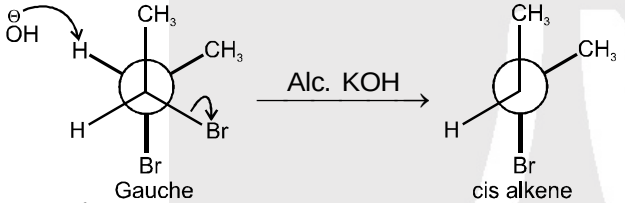
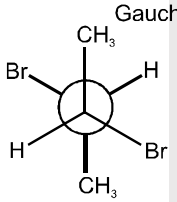
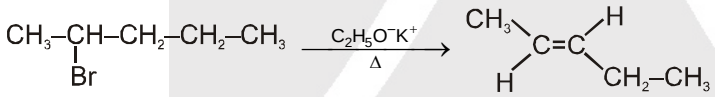


Gauche cis alkene



No anti β-H is present.

8.



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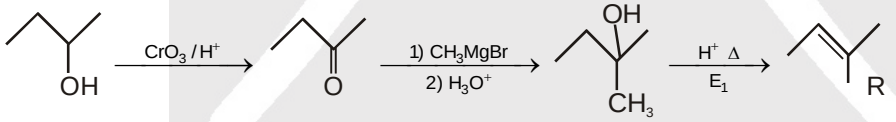

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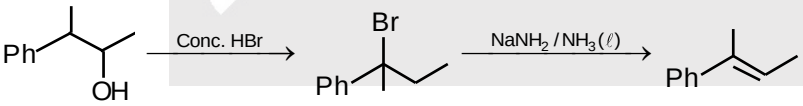

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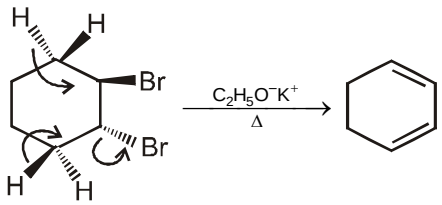
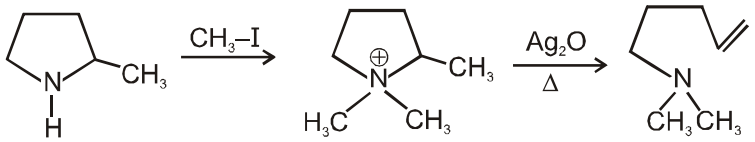
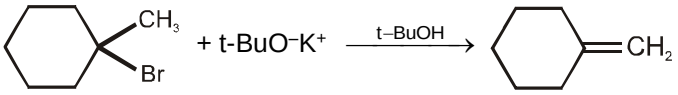


Trans

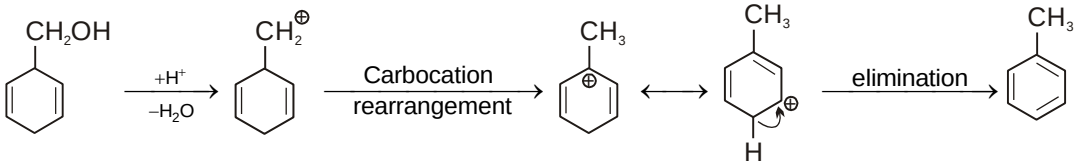
12.



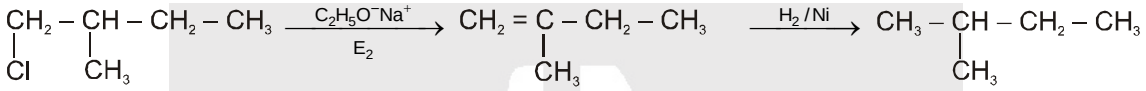
13. Self understood

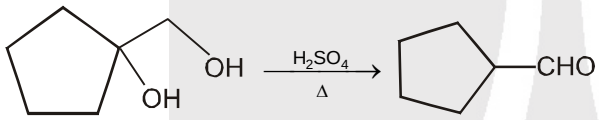
14. 

17. The reaction follows E1cb mechanism in which reactant undergoes D exchange alongwith an elimination product.

18. 

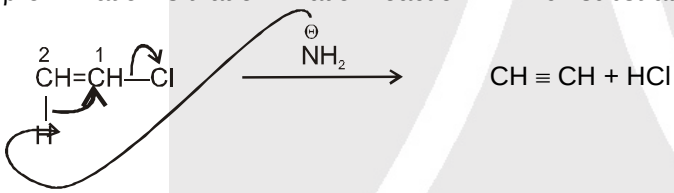
19. It is a basic fact.

20. 

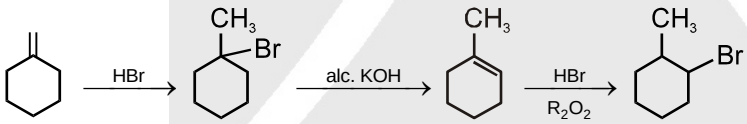
22. 

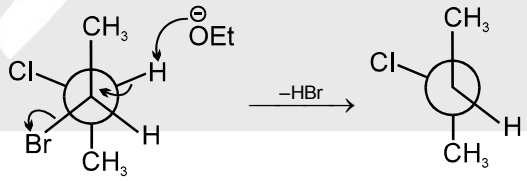
(Pinacol–Pinacolone rearrangement).

23. β-elimination is that elimination reaction in which substrate looses two atoms from 1 & 2 position.

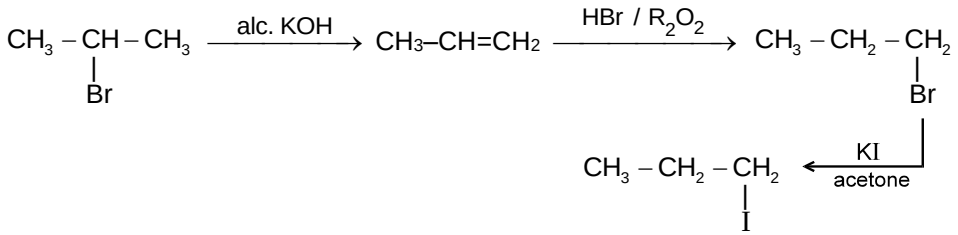


$NaNH_2$ is strong base so give β-elimination reaction.

25. 

26. The T.S. involves 

trans Alkene

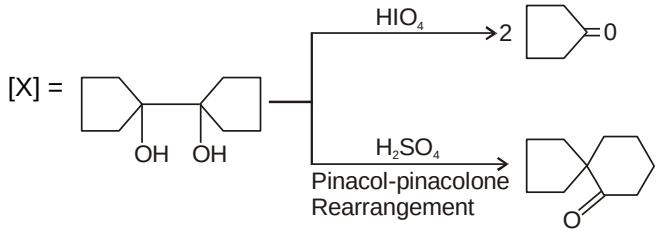
27. 

PART - III

1. The more stable conformation of chlorocyclohexane does not undergo an E-2 elimination easily while the less stable conformer, with the chloro group in the axial position, readily undergoes an E-2 reaction.

2. [C] is incorrect because more than one isomer gives a single alkene on E2 elimination.

3.



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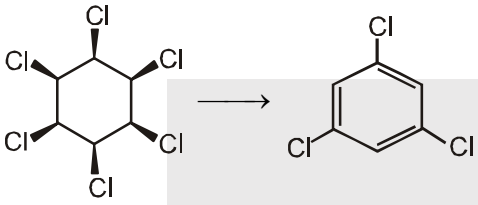

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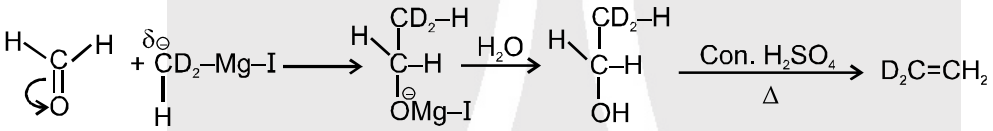

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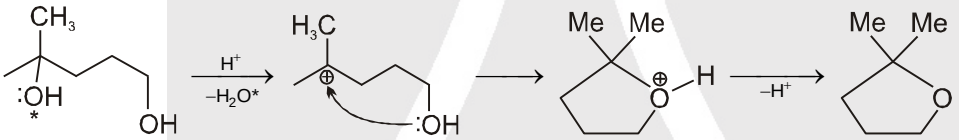

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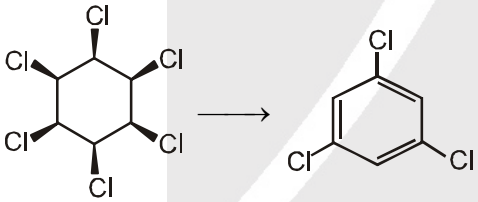
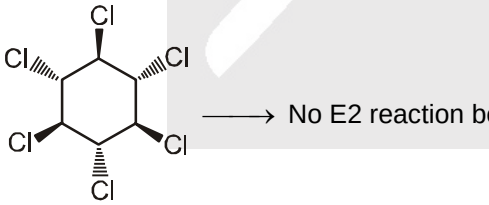
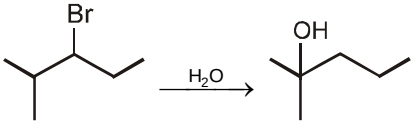




⟶ No E2 reaction because β-hydrogen and leaving group not present in anti position.

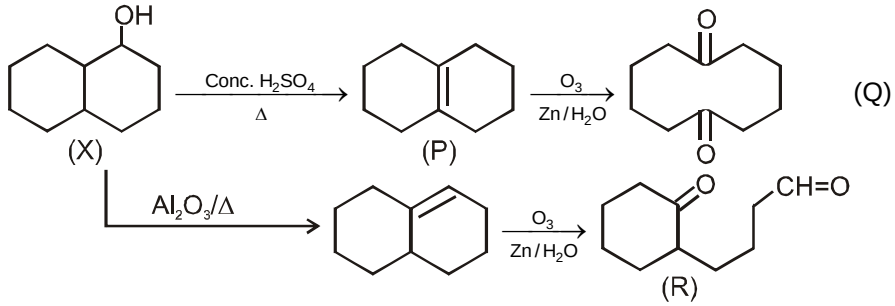
11. In S_N2 reaction inversion takes place.

12. Correct product for (C) option.



13. All statement are correct.

14.



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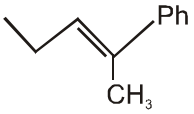
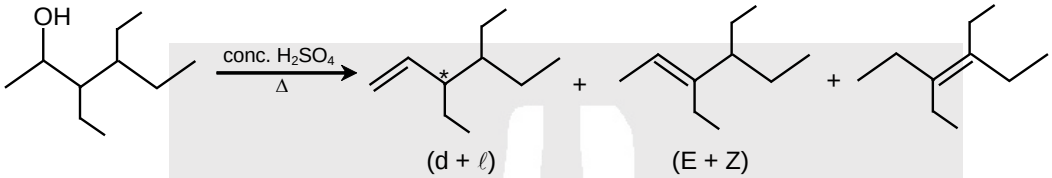


E1

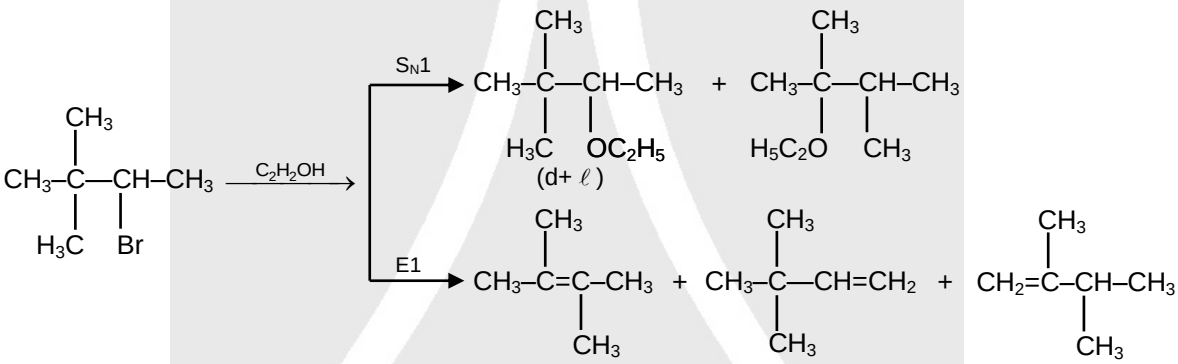
(cis + Trans)

16.

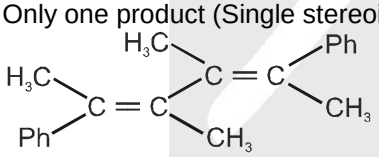


(d + ℓ) (E + Z)

17.

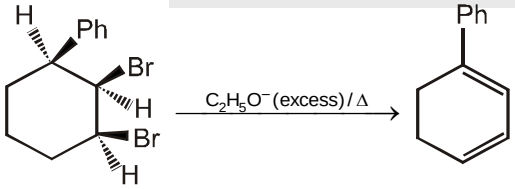


18. Only one product (Single stereoisomer)



(Trans-Trans)

19.



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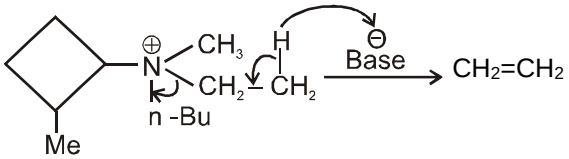

21. –I and –M group increases acidic strength.