

CHEMISTRY

BOOKS - MS CHOUHAN CHEMISTRY (HINGLISH)

ALKENES AND ALKYNES I

Solved Problem

1. The two stereoisomers of 1 - bromo-1, 2-dichloroethene can - not be designated as cis and trans in the normal way because the double bond is trisubstituted. They can, however, be given (E) and (Z)

designations. Write a structural formula for each isomer and give each the proper designation.



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2. Consider the two alkenes 2-methyl-1-pentene and 2-methyl-2-pentene and decide which would be most stable.



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3. Using Zaitsev's rule, predict which would be the major product of the following reaction:





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4. Your task is the following synthesis. Which base would you use to maximum the yield of this specific alkene ?



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5. Predict the major product formed when the following compound is subjected to dehydrochlorination with sodium ethoxide in ethanol.





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6. Explain why the major product of the dehydration above is 1,2 - dimethylcyclohexene (as shown) and not 2,3 - dimethyl -1-cyclohexene.



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7. As we shall soon see, sodium amide (NaNH_2) is useful, especially when a reaction requires a very strong base. Explain why a solvent such as methanol

cannot be used to carry out a reaction in which you might want to use sodium amide as a base.



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8. Outline a synthesis of 4-phenyl-2-butyne from 1-propyne.



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9. Outline a retrosynthetic pathway that leads from 'muscalure', the sex attractant pheromone of the common housefly back to the simplest alkyne, ethyne

(acetylene). Then show the synthesis. You may use any inorganic compounds. Or solvents, you need and alkyl halides of any length necessary.



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17. Outline a synthesis of 4-phenyl-2-butyne from 1-propyne.



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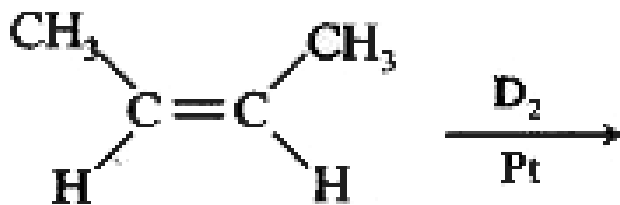
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Additional Objective Questions Single Correct Choice Type

1. Major product of the following reaction is



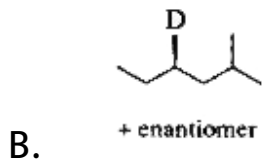
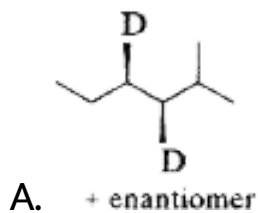
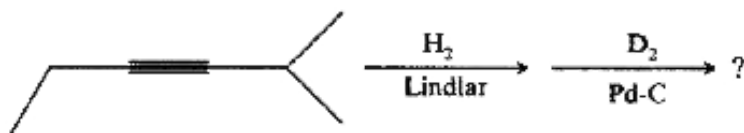
- A. racemic mixture
- B. diastereomer
- C. meso compound
- D. structural isomer

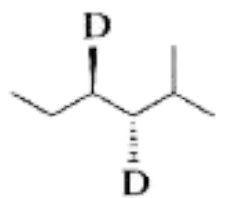
Answer: C



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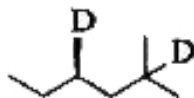
2. Select the major product from the following reaction sequence.





+ enantiomer

C.



+ enantiomer

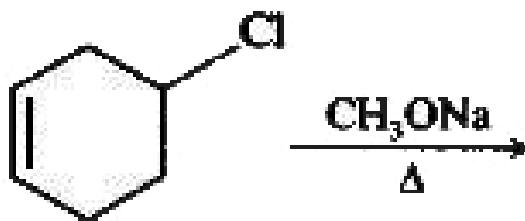
D.

Answer: C



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3. The following reaction proceeds by which mechanism ?



A. S_N1

B. S_N2

C. E_2

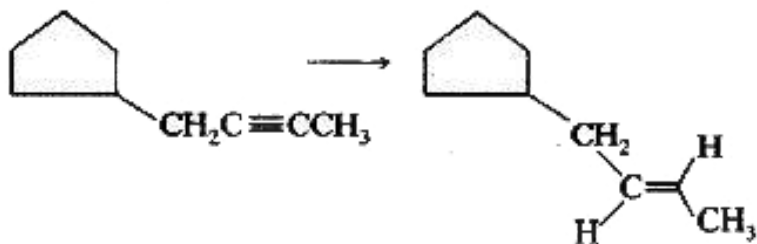
D. E_1

Answer: C



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4. Reagent used to carry out following conversion from alkyne to alkene is



A. $Pd - C / H_2$

B. Na / NH_3

C. Pt / H_2

D. Ni / H_2

Answer: B



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5. The reagent(s) for the following conversion is/are



A. alc. KOH

B. alc. KOH followed by $NaNH_2$

C. aq. KOH followed by $NaNH_2$

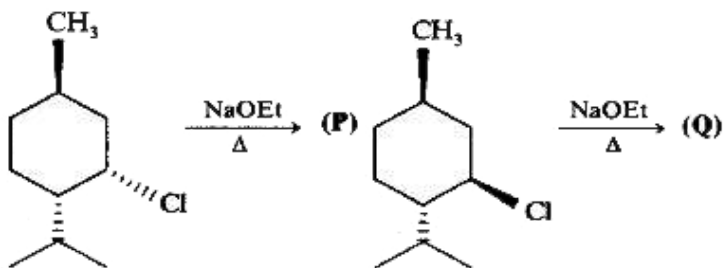
D. Zn / CH_3OH

Answer: B



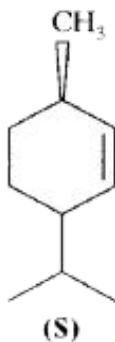
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6. Consider the following reaction:



Identify product (P) and (Q) from the following

compounds:



A. P = R, Q = S

B. P = S, Q = S

C. P = S, Q = R

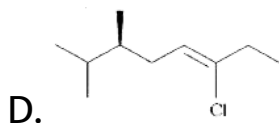
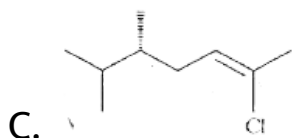
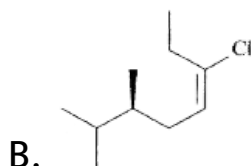
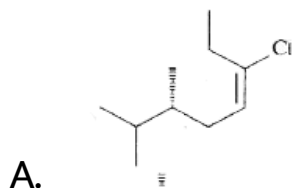
D. P = R, Q = R

Answer: A



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7. Choose the compound with the (S) chiral carbon and the (Z) double bond configuration

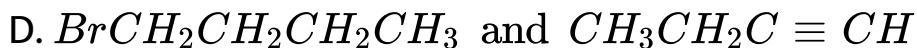
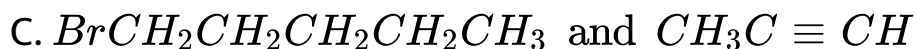
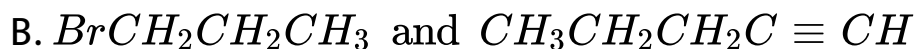
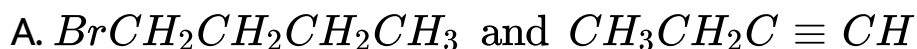


Answer: D



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8. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne, respectively, are

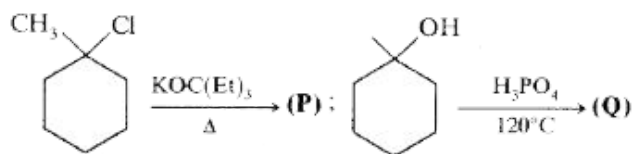


Answer: D

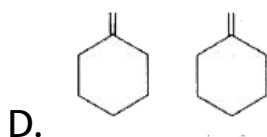
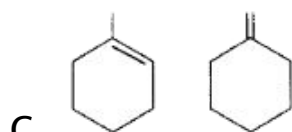
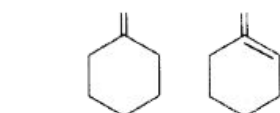
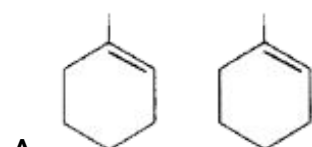


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9.



Products (P) and(Q) are

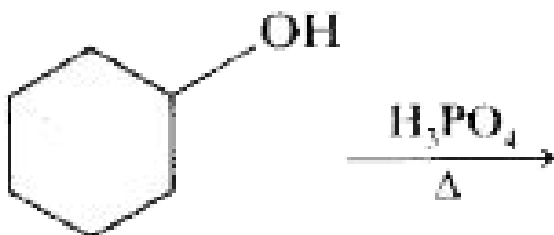


Answer: B





10. The following reaction proceeds by which mechanism ?



A. S_N1

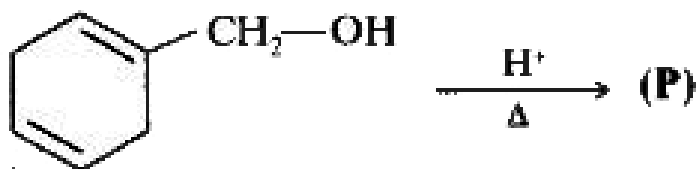
B. S_N2

C. E_2

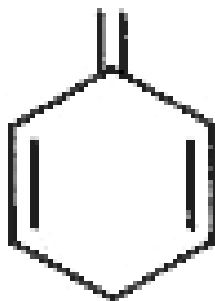
D. E_1

Answer: D

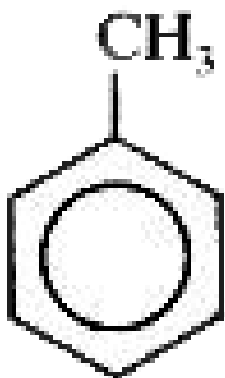
11. Consider the following reaction:



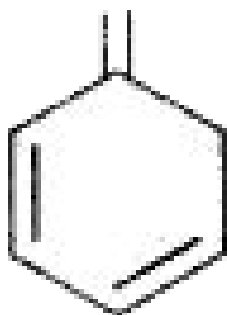
If (P) on heating isomerizes to (Q). What is the structure of (Q) ?



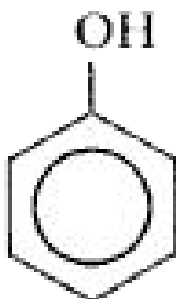
A.



B.



C.



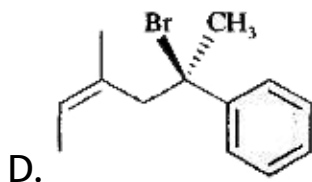
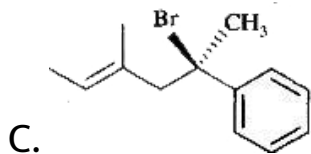
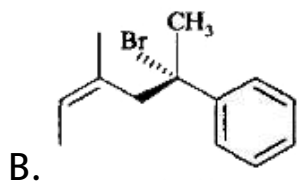
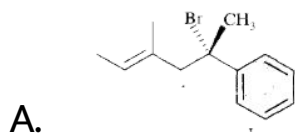
D.

Answer: B



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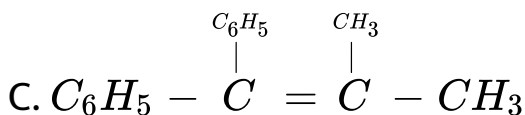
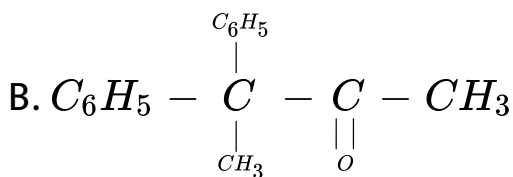
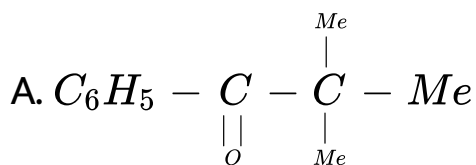
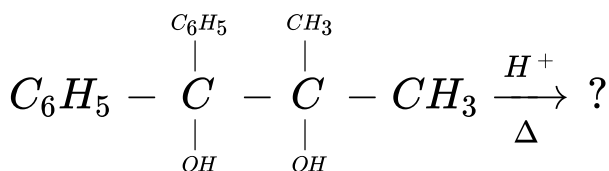
12. Choose the structure that has the name (R, Z)-2-bromo-4-methyl-2-phenylhex-4-ene.



Answer: D

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13. Identify the final product in the reaction

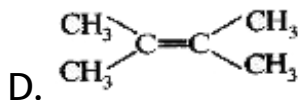
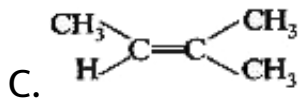
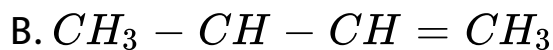
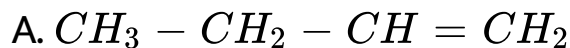


D. Stilbene

Answer: B

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14. Which of the following alkene is most stable ?

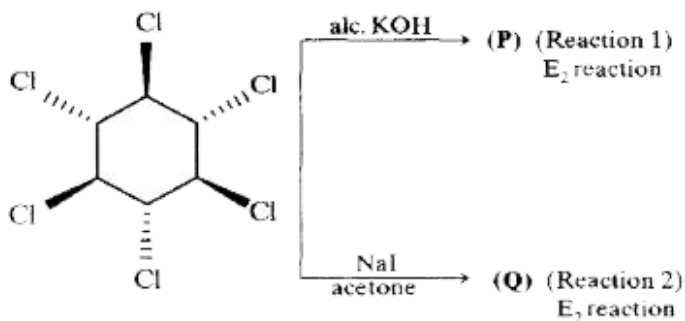


Answer: D



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15. How many halogen atoms will be removed in the following E_2 reaction ?



A. 4

B. 6

C. 8

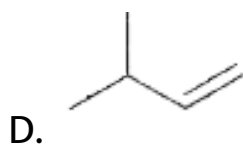
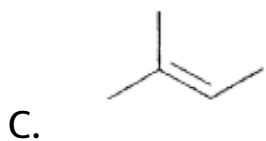
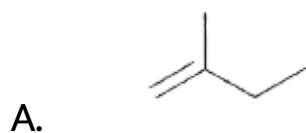
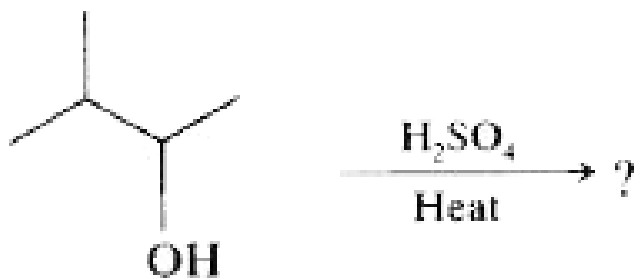
D. 10

Answer: B



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16. What is the major product of the following reaction ?

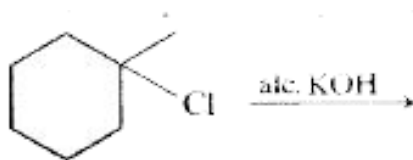


Answer: C



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17. The following reaction proceeds by which mechanism ?



A. S_N1

B. S_N2

C. E2

D. E1

Answer: C

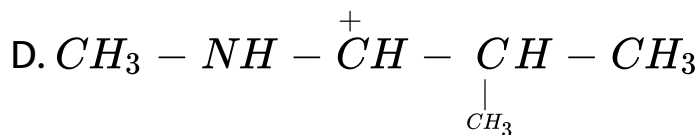
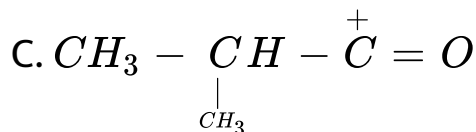


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18. Which of the following carbocation will undergo rearrangement ?

A. 

B. 



Answer: B



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19. The most reactive conformation for an E2 reaction is

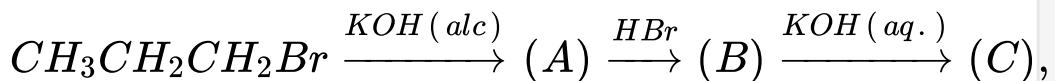
- A. syn periplanar
- B. anti periplanar
- C. gauche staggered
- D. gauche eclipsed

Answer: B



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20. In the following sequence of reactions



The product (C) is

A. propan-2-ol

B. propan-1-ol

C. propyne

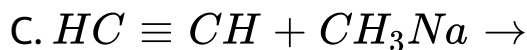
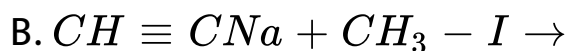
D. propene

Answer: A



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21. Which of the reactions can not be used to synthesize propyne ?

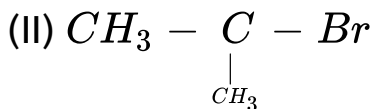
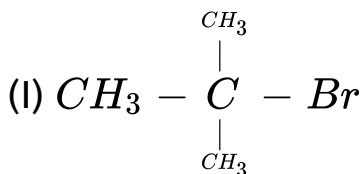


Answer: C



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22. Consider the following compounds



Their reactivity toward E1 is

A. I gt II gt III

B. II gt I gt III

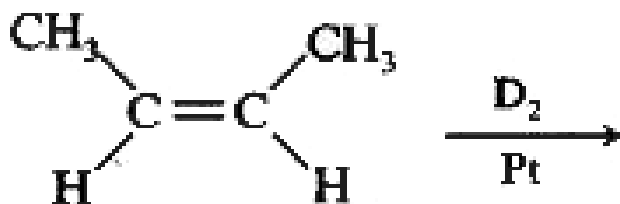
C. II gt III gt I

D. III gt II gt I

Answer: A



23. Major product of the following reaction is



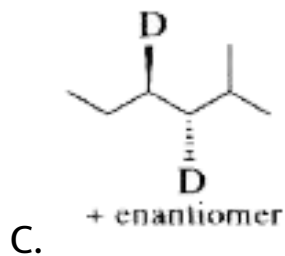
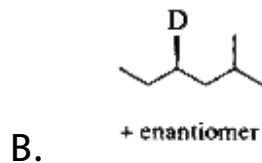
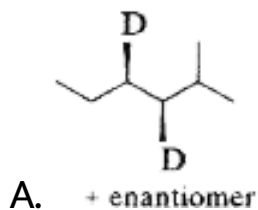
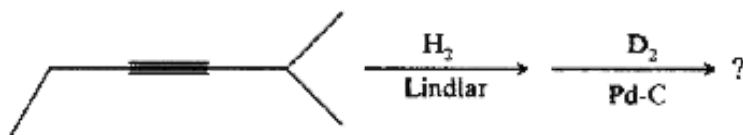
- A. racemic mixture
- B. diastereomer
- C. meso compound
- D. structural isomer

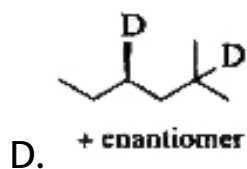
Answer: C



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24. Select the major product from the following reaction sequence.

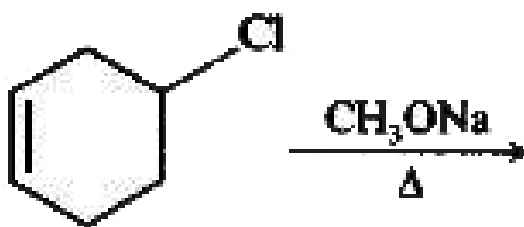




Answer: C

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25. The following reaction proceeds by which mechanism ?



A. S_N1

B. S_N2

C. E_2

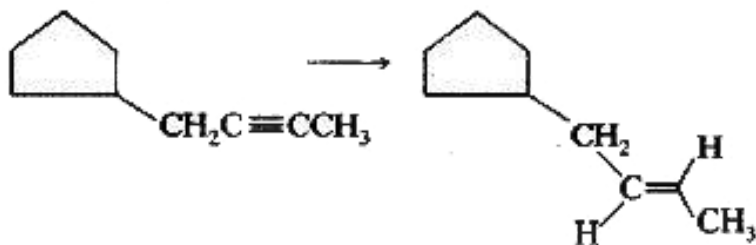
D. E_1

Answer: C

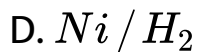
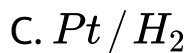
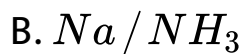


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26. Reagent used to carry out following conversion from alkyne to alkene is



A. $Pd - C / H_2$



Answer: B



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27. The reagent(s) for the following conversion is/are



A. alc. KOH

B. alc. KOH followed by $NaNH_2$

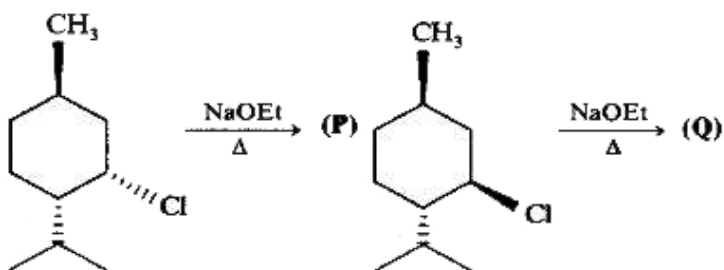
C. aq. KOH followed by $NaNH_2$

D. Zn/CH_3OH

Answer: B

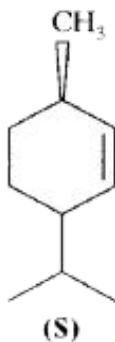
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28. Consider the following reaction:



Identify product (P) and (Q) from the following

compounds:



A. P = R, Q = S

B. P = S, Q = S

C. P = S, Q = R

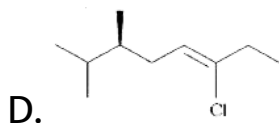
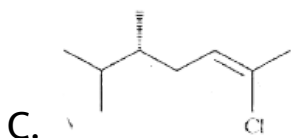
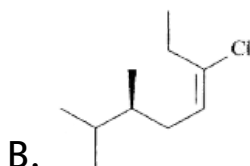
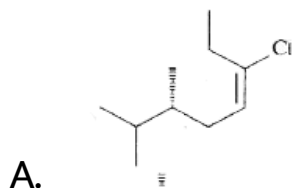
D. P = R, Q = R

Answer: A



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29. Choose the compound with the (S) chiral carbon and the (Z) double bond configuration

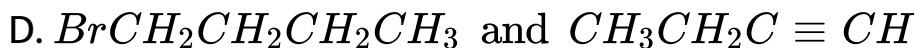
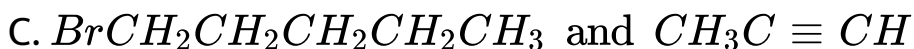
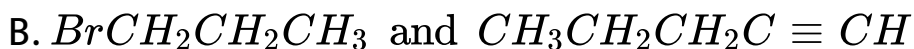
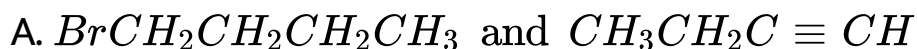


Answer: D



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30. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne, respectively, are

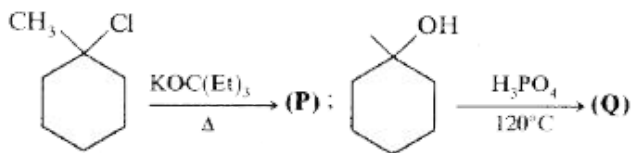


Answer: D

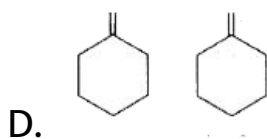
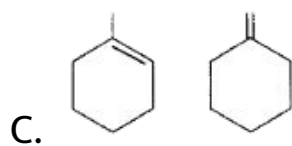
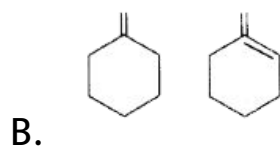
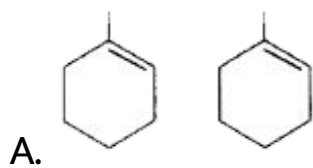


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31.



Products (P) and(Q) are

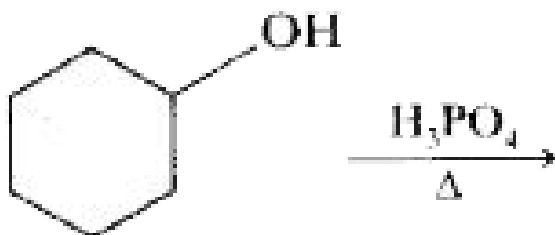


Answer: B





32. The following reaction proceeds by which mechanism ?



A. S_N1

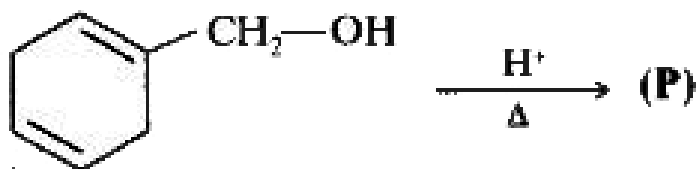
B. S_N2

C. E_2

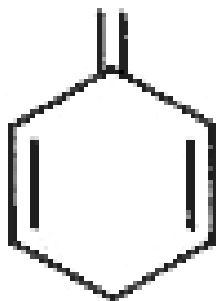
D. E_1

Answer: D

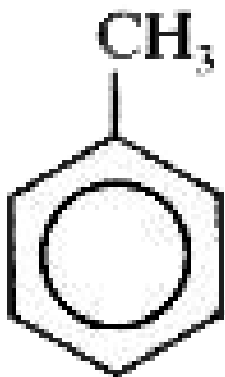
33. Consider the following reaction:



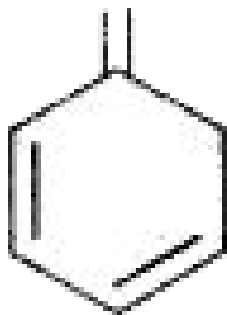
If (P) on heating isomerizes to (Q). What is the structure of (Q) ?



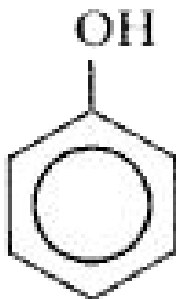
A.



B.



C.



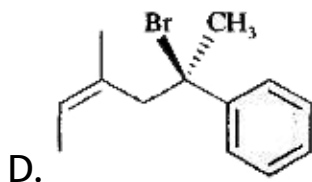
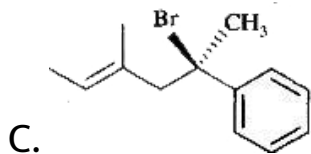
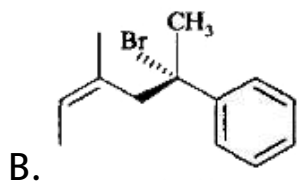
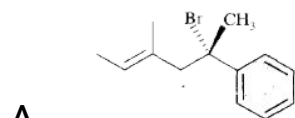
D.

Answer: B



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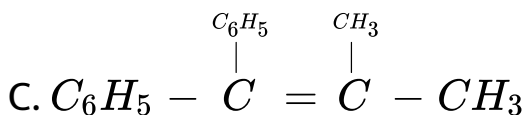
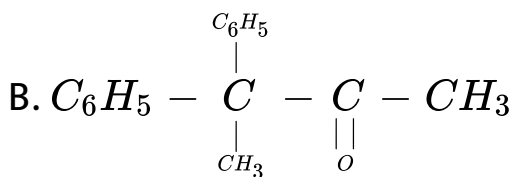
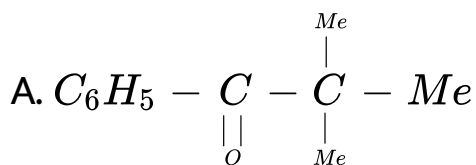
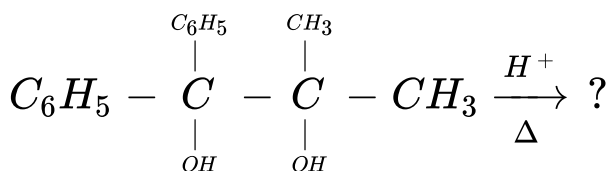
34. Choose the structure that has the name (R, Z)-2-bromo-4-methyl-2-phenylhex-4-ene.



Answer: D

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35. Identify the final product in the reaction

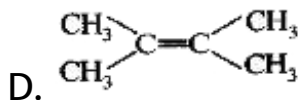
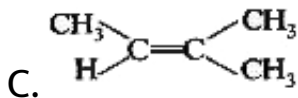
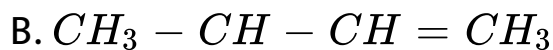
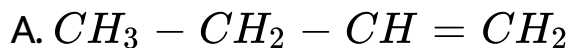


D. Stilbene

Answer: B

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36. Which of the following alkene is most stable ?

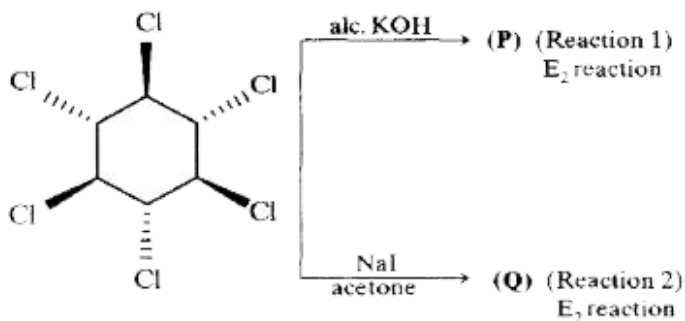


Answer: D



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37. How many halogen atoms will be removed in the following E_2 reaction ?



A. 4

B. 6

C. 8

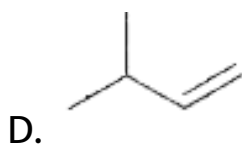
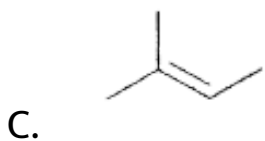
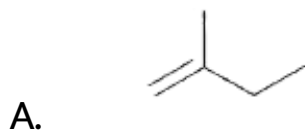
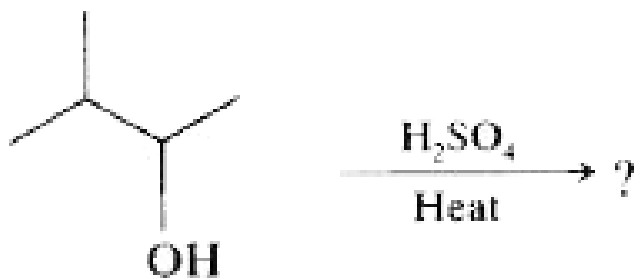
D. 10

Answer: B



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38. What is the major product of the following reaction ?

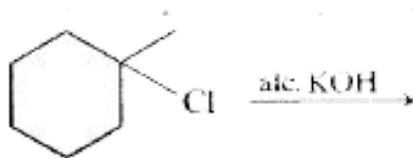


Answer: C



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39. The following reaction proceeds by which mechanism ?



A. S_N1

B. S_N2

C. E2

D. E1

Answer: C

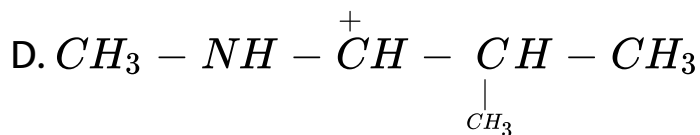
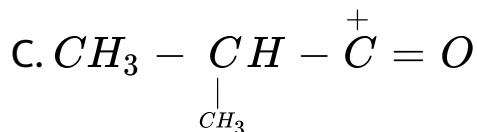


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40. Which of the following carbocation will undergo rearrangement ?

A. 

B. 



Answer: B



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41. The most reactive conformation for an E2 reaction is

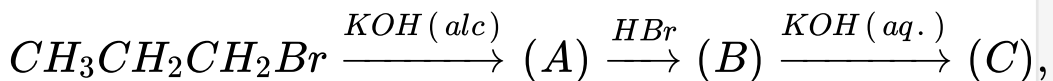
- A. syn periplanar
- B. anti periplanar
- C. gauche staggered
- D. gauche eclipsed

Answer: B



[View Text Solution](#)

42. In the following sequence of reactions



The product (C) is

A. propan-2-ol

B. propan-1-ol

C. propyne

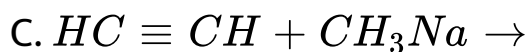
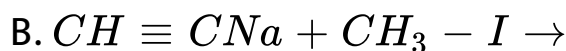
D. propene

Answer: A



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43. Which of the reactions can not be used to synthesize propyne ?

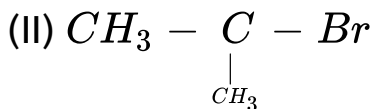
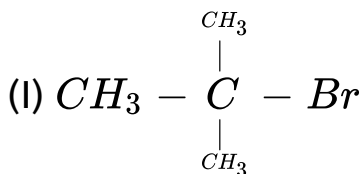


Answer: C



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44. Consider the following compounds



Their reactivity toward E1 is

A. I gt II gt III

B. II gt I gt III

C. II gt III gt I

D. III gt II gt I

Answer: A



Additional Objective Questions Multiple Correct Choice Type

1. Which of the following alkene has the Z configuration along the double bond ?

A. 

B. 

C. 

D. 

Answer: A::C

2. Which of the following alkene has the Z configuration along the double bond ?

A. 

B. 

C. 

D. 

Answer: A::C