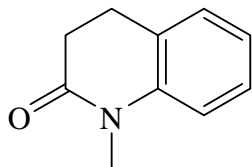
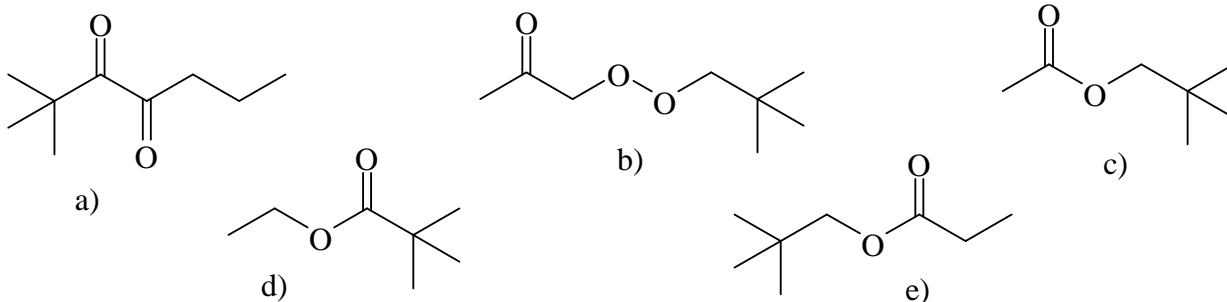


1. What is the molecular formula of the following compound?

- a) C_9H_9NO
 b) $C_9H_{10}NO$
 c) $C_{10}H_{10}NO$
 d) $C_{10}H_{11}NO$
 e) $C_{10}H_{12}NO$

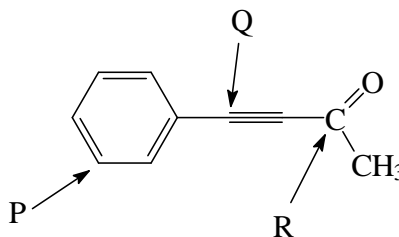


2. Which of the following is the correct stick representation of $CH_3COCH_2OOCCH_2C(CH_3)_3$?



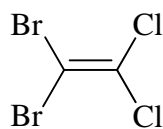
3. What are the approximate bond angles in the following compound?

- a) $P = 120^\circ$, $Q = 120^\circ$, $R = 120^\circ$
 b) $P = 120^\circ$, $Q = 180^\circ$, $R = 120^\circ$
 c) $P = 120^\circ$, $Q = 180^\circ$, $R = 109.5^\circ$
 d) $P = 109.5^\circ$, $Q = 180^\circ$, $R = 120^\circ$
 e) $P = 109.5^\circ$, $Q = 120^\circ$, $R = 90^\circ$

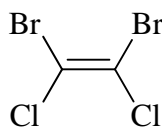


4. Which of the following pairs of structures are constitutional isomers?

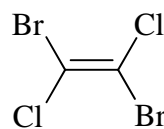
- a) **X** and **Y**
 b) **W** and **Y**
 c) **X** and **Z**
 d) **Y** and **Z**
 e) none of the above



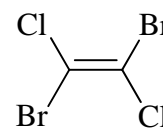
W



X

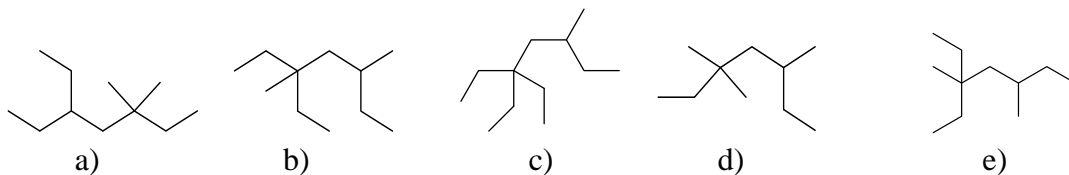


Y

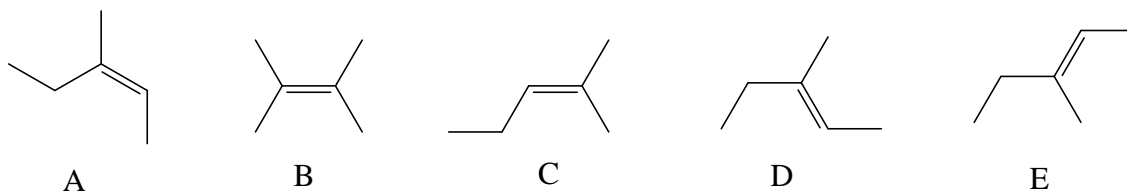


Z

5. Which of the following stick representations is 5-ethyl-3,3-dimethylheptane?

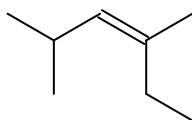


6. What is the correct stick representation of (Z)-3-methyl-2-pentene?

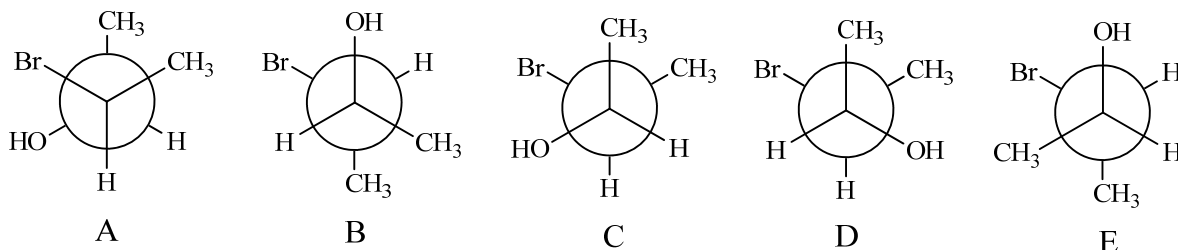
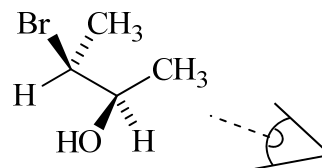


7. What is the correct name for the following compound?

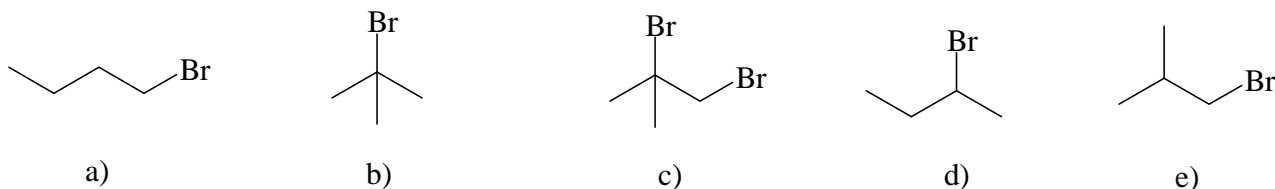
- a) (E)-3,5-dimethyl-3-hexene
 b) (Z)-3,5-dimethyl-3-hexene
 c) (Z)-2,4-dimethyl-3-hexene
 d) (E)-2-ethyl-4-methyl-2-pentene
 e) (Z)-2-ethyl-4-methyl-2-pentene



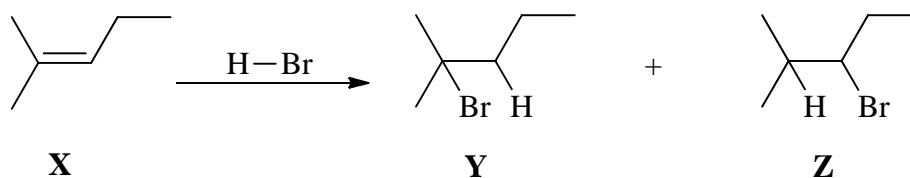
8. Identify the correct Newman projection when the given molecule is viewed from the right hand side as shown.



9. What is the major product from the addition of HBr to 1-butene?



10. Identify the nucleophile and electrophile in the first step of the following reaction and also predict which will be the major product formed.

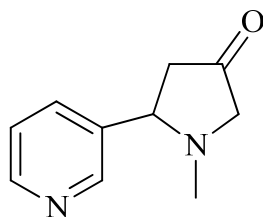


- | | nucleophile | electrophile | major product |
|----|-------------|--------------|-----------------------------|
| a) | H of HBr | X | Y and Z equal |
| b) | X | Br of HBr | Z |
| c) | H of HBr | X | Y |
| d) | X | H of HBr | Y |
| e) | Br of HBr | X | Z |

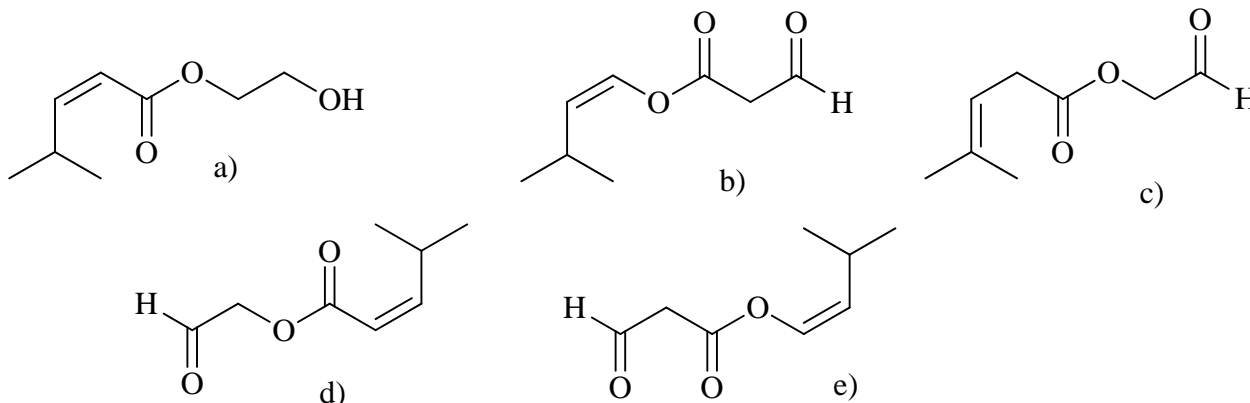
Correct answers: 1D, 2B, 3B, 4B, 5A, 6A, 7C, 8C 9D, 10D

1. What is the molecular formula of the following compound?

- a) $C_9H_9N_2O$
 b) $C_9H_{10}N_2O$
 c) $C_{10}H_{10}N_2O$
 d) $C_{10}H_{11}N_2O$
 e) $C_{10}H_{12}N_2O$

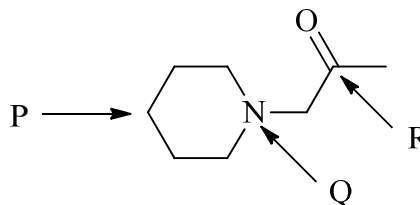


2. Which of the following is the correct stick representation of $(CH_3)_2CHCH=CHCOOCH_2CHO$?



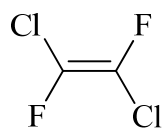
3. What are the approximate bond angles in the following compound?

- a) $P = 120^\circ$, $Q = 109.5^\circ$, $R = 120^\circ$
 b) $P = 109.5^\circ$, $Q = 120^\circ$, $R = 120^\circ$
 c) $P = 109.5^\circ$, $Q = 109.5^\circ$, $R = 120^\circ$
 d) $P = 109.5^\circ$, $Q = 109.5^\circ$, $R = 109.5^\circ$
 e) $P = 120^\circ$, $Q = 120^\circ$, $R = 120^\circ$

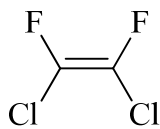


4. Which of the following pairs of structures are constitutional isomers?

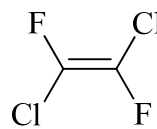
- a) **X** and **Y**
 b) **X** and **Z**
 c) **W** and **X**
 d) **W** and **Y**
 e) none of the above



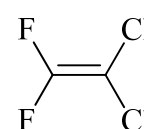
W



X

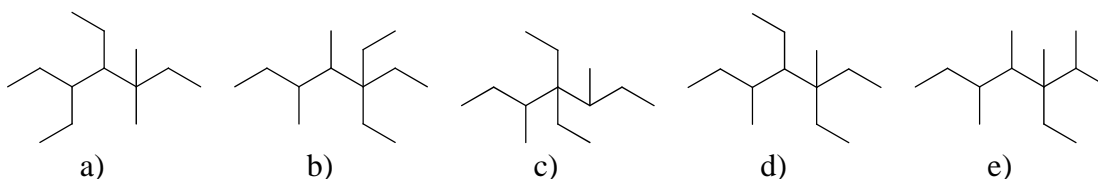


Y

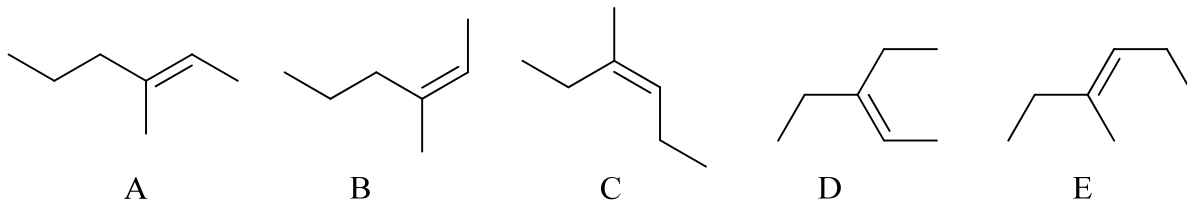


Z

5. Which of the following stick representations is 3,4-diethyl-3,5-dimethylheptane?

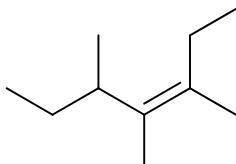


6. What is the correct stick representation of (*E*)-3-methyl-3-hexene?

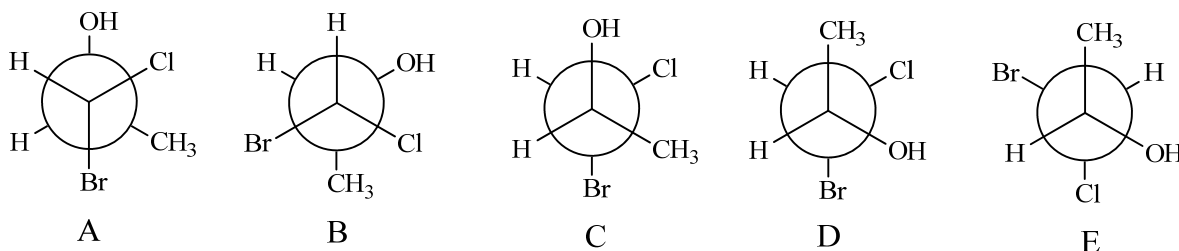
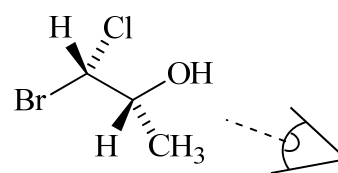


7. What is the correct name for the following compound?

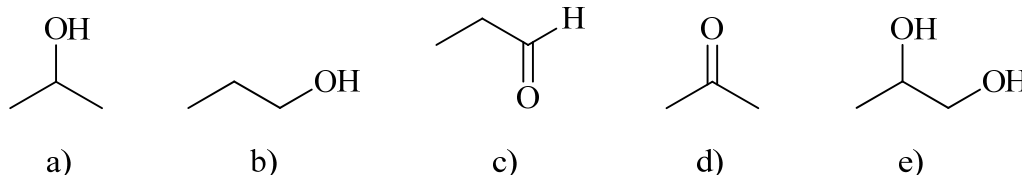
- a) (*E*)-3,4,5-trimethyl-4-heptene
 b) (*Z*)-3,4,5-trimethyl-3-heptene
 c) (*E*)-3,4,5-trimethyl-3-heptene
 d) (*E*)-2-ethyl-3,4-dimethyl-2-hexene
 e) (*Z*)-2-ethyl-3,4-dimethyl-2-hexene



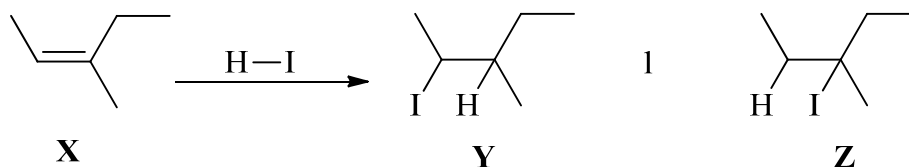
8. Identify the correct Newman projection when the given molecule is viewed from the right hand side as shown.



9. What is the major product from the addition of H₂O (using dilute H₂SO₄) to propene?



10. Identify the nucleophile and electrophile in the first step of the following reaction and also predict which will be the major product formed.



- | | nucleophile | electrophile | major product |
|----|-------------|--------------|----------------------|
| a) | X | H of HI | Z |
| b) | X | I of HI | Y |
| c) | H of HI | X | Z |
| d) | H of HI | X | Y and Z equal |
| e) | I of HI | X | Z |

Correct answers: 1E, 2D, 3C, 4B, 5D, 6E, 7B, 8C 9A, 10A