

Q1.How many isomers have the molecular formula C_5H_{12} ?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q2.How many structural isomers have the molecular formula C_4H_9Br ?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q3.How many secondary amines have the molecular formula $C_4H_{11}N$?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q4. Which one of the following can exhibit both geometrical and optical isomerism?

- A $(\text{CH}_3)_2\text{C}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- B $\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
- C $(\text{CH}_3)_2\text{C}=\text{C}(\text{CH}_2\text{CH}_3)_2$
- D $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{C}=\text{CH}_2$

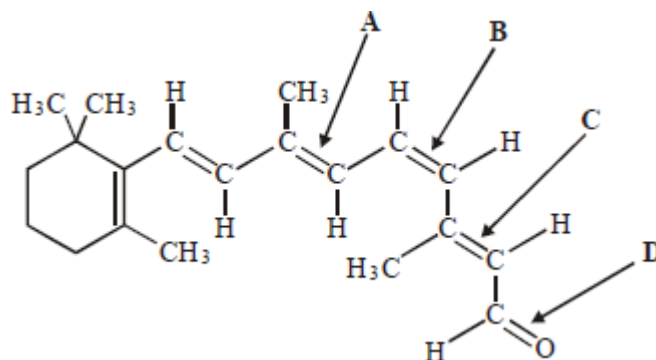
(Total 1 mark)

Q5. How many different alkenes are formed when 2-bromo-3-methylbutane reacts with ethanolic potassium hydroxide?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q6. The compound *cis*-retinal is shown below.



Which one of the labelled bonds leads to the prefix in the name?

(Total 1 mark)

Q7. Which one of the following is a pair of functional group isomers?

- A** $\text{CH}_3\text{COOCH}_2\text{CH}_3$ and $\text{CH}_3\text{CH}_2\text{COOCH}_3$
- B** $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2$ and $(\text{CH}_3)_3\text{CCH}_2\text{CH}_3$
- C** $\text{CH}_3\text{CH}_2\text{OCH}_3$ and $(\text{CH}_3)_2\text{CHOH}$
- D** $\text{ClCH}_2\text{CH}_2\text{CH}=\text{CH}_2$ and $\text{CH}_3\text{CH}=\text{CHCH}_2\text{Cl}$

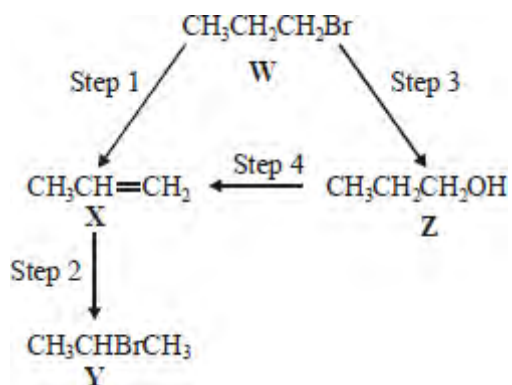
(Total 1 mark)

Q8. Propanone can be reduced to form an alcohol. A functional group isomer of the alcohol formed is

- A** $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
- B** $\text{CH}_3\text{CH}_2\text{CHO}$
- C** $\text{CH}_3\text{OCH}_2\text{CH}_3$
- D** CH_3COCH_3

(Total 1 mark)

Q9. For this question refer to the reaction scheme below.

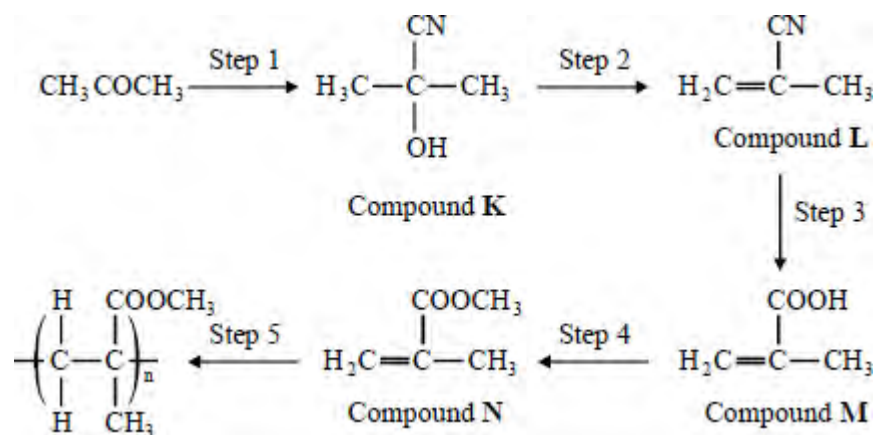


Which one of the following statements is **not** correct?

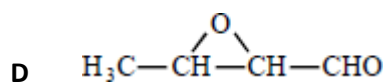
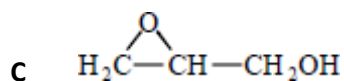
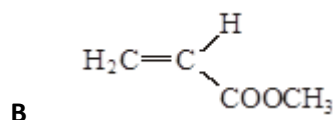
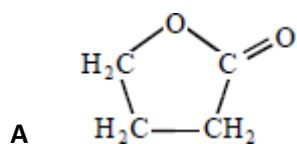
- A W and Y are structural isomers.
- B Z is a primary alcohol.
- C Y gives two peaks in its proton n.m.r. spectrum.
- C X has geometrical isomers.

(Total 1 mark)

Q10. This question concerns the preparation of the plastic poly(methyl 2-methylpropenoate) (*Perspex*), starting from propanone.

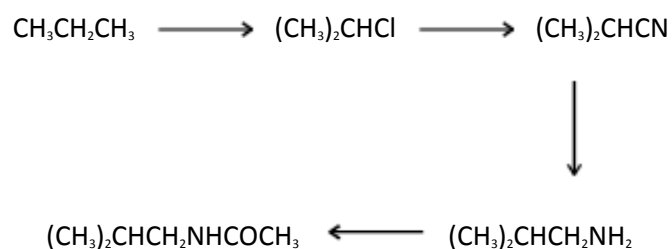


Which one of the following is **not** a structural isomer of Compound **M**?



(Total 1 mark)

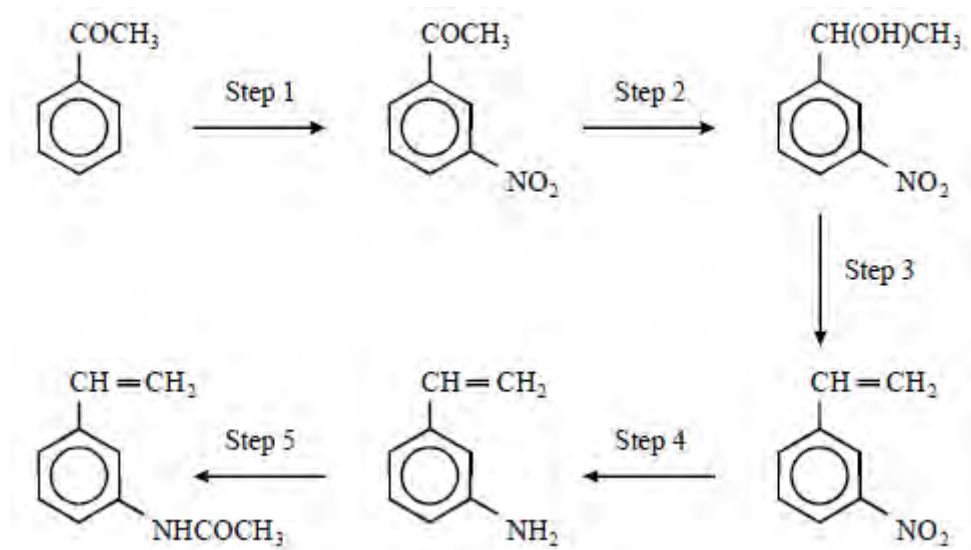
Q11. Which one of the following types of reaction mechanism is **not** involved in the above sequence?



- A** free-radical substitution
- B** nucleophilic substitution
- C** elimination
- D** nucleophilic addition-elimination

(Total 1 mark)

Q12. Refer to the following reaction sequence:

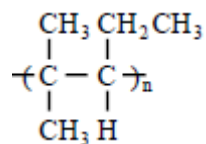


Which one of the following types of reaction mechanism is **not** involved in the above sequence?

- A electrophilic addition
- B electrophilic substitution
- C addition-elimination
- D elimination

(Total 1 mark)

Q13. The correct name for the alkene monomer which forms the polymer shown below is



- A 2-methyl-3-ethylpropene
- B 2-methylpent-2-ene
- C 2-methylpent-3-ene
- D 4-methylpent-2-ene

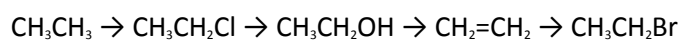
(Total 1 mark)

Q14. The number of structural isomers of $C_3H_2Cl_6$ is

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

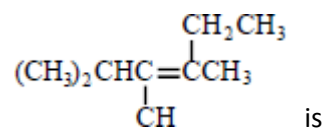
Q15. Which one of the following mechanisms is **not** involved in the reaction sequence below?



- A electrophilic addition
- B electrophilic substitution
- C nucleophilic substitution
- D free-radical substitution

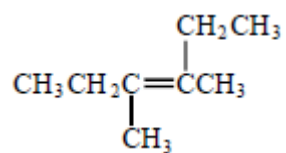
(Total 1 mark)

Q16. The correct systematic name for



- A 2-ethyl-3,4-dimethylpent-2-ene
- B 4-ethyl-2,3-dimethylpent-3-ene
- C 2,3,4-trimethylhex-3-ene
- D 3,4,5-trimethylhex-3-ene

(Total 1 mark)



Q17. The correct systematic name for is

- A 2,3-diethylbut-2-ene
- B 2-ethyl-3-methylpent-2-ene
- C 4-ethyl-3-methylpent-3-ene
- D 3,4-dimethylhex-3-ene

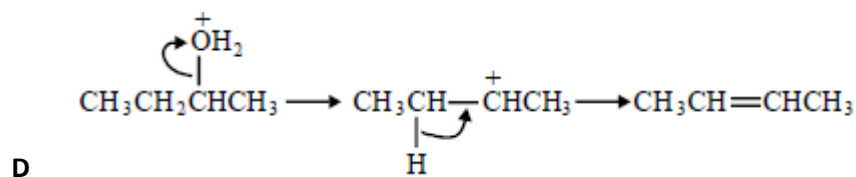
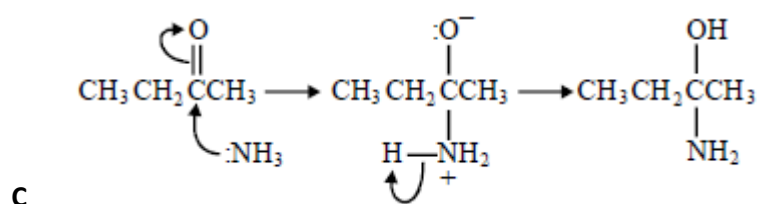
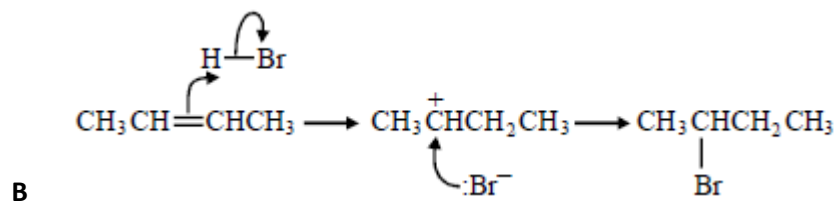
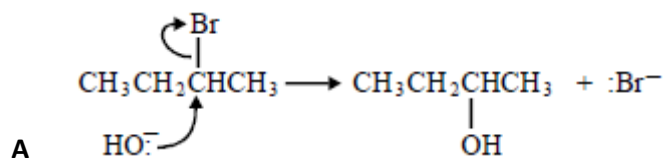
(Total 1 mark)

Q18. How many structural isomers, which are aldehydes, have the molecular formula $\text{C}_5\text{H}_{10}\text{O}$?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q19. In which of the following is a curly arrow used incorrectly?



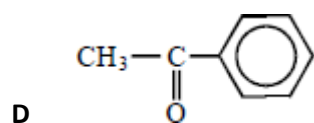
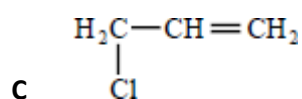
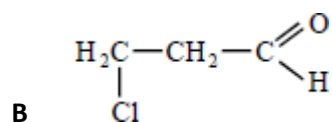
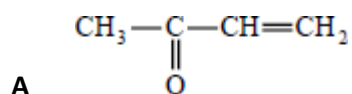
(Total 1 mark)

Q20. Which one of the following is the correct name for $\text{CH}_3\text{C}(\text{Br})(\text{CH}_2\text{CH}_3)\text{CH}=\text{CH}_2$?

- A 2-bromo-3-methylpent-2-ene
- B 2-bromo-3-ethylbut-2-ene
- C 3-bromo-2-ethylbut-2-ene
- D 4-bromo-3-methylpent-3-ene

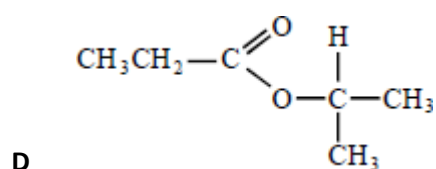
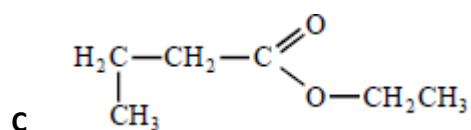
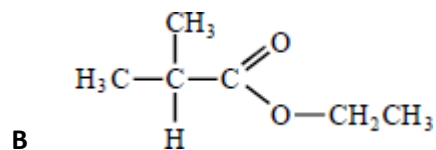
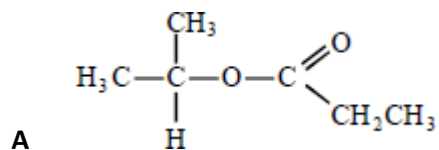
(Total 1 mark)

Q21. Which one of the following can react both by nucleophilic addition and by nucleophilic substitution?



(Total 1 mark)

Q22. The structural formula of ethyl 2-methylpropanoate is



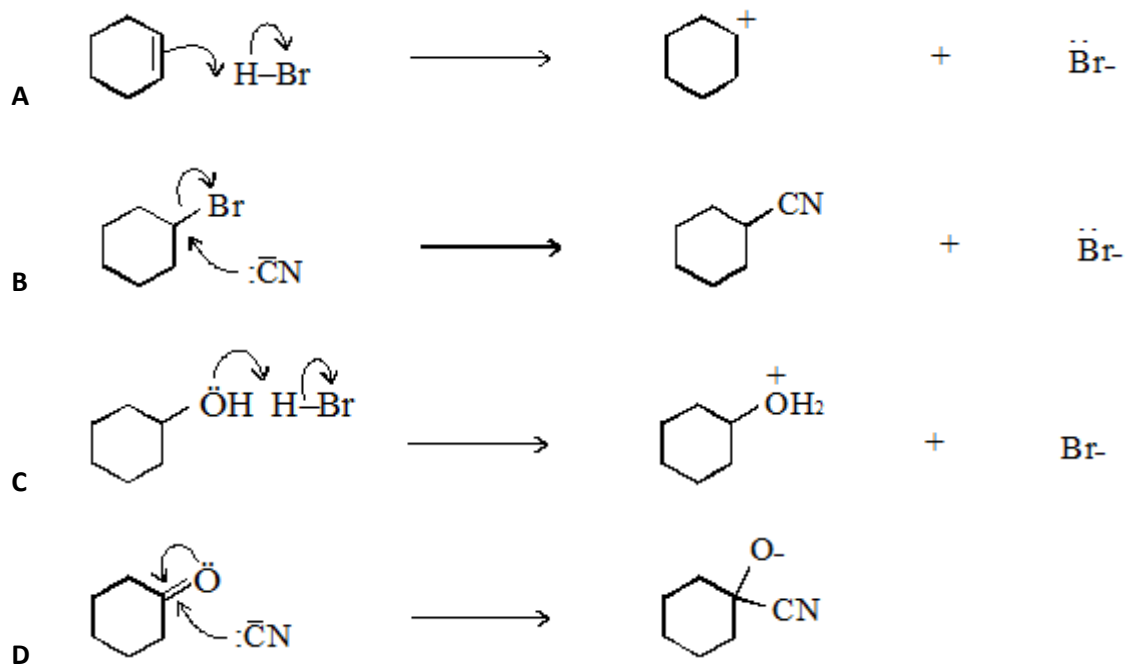
(Total 1 mark)

Q23. How many structural isomers, which are esters, have the molecular formula $C_4H_8O_2$?

- A 2
- B 3
- C 4
- D 5

(Total 1 mark)

Q24. In which one of the following are the curly arrows **not** used correctly?



(Total 1 mark)

Q25.CH₂O is the empirical formula of

- A** methanol
- B** methyl methanoate
- C** ethane-1,2-diol
- D** butanal

(Total 1 mark)

Q26.

Summarised directions for recording responses to multiple completion questions			
A (i), (ii) and (iii) only	B (i) and (iii) only	C (ii) and (iv) only	D (iv) alone

Isomers of the ester HCOOCH₂CH₂CH₃, include

- (i) ethyl ethanoate
- (ii) methyl propanoate
- (iii) butanoic acid
- (iv) butyl methanoate

(Total 1 mark)

Q27.The number of structural isomers of molecular formula C₄H₉Br is

- A** 5
- B** 4
- C** 3
- D** 2

(Total 1 mark)