

**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**  $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{CH}_3)\text{C}=\text{CH}_2$

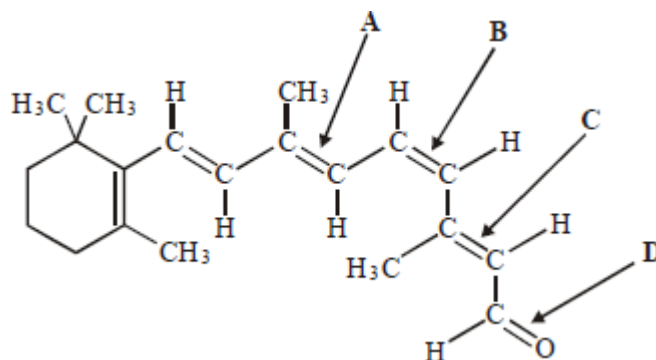
(Total 1 mark)

**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  $\text{CH}_3\text{CH}=\text{CHCH}_2\text{Cl}$

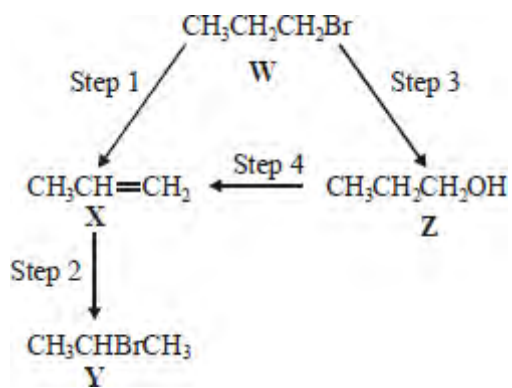
**(Total 1 mark)**

**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**  $\text{CH}_3\text{COCH}_3$

**(Total 1 mark)**

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

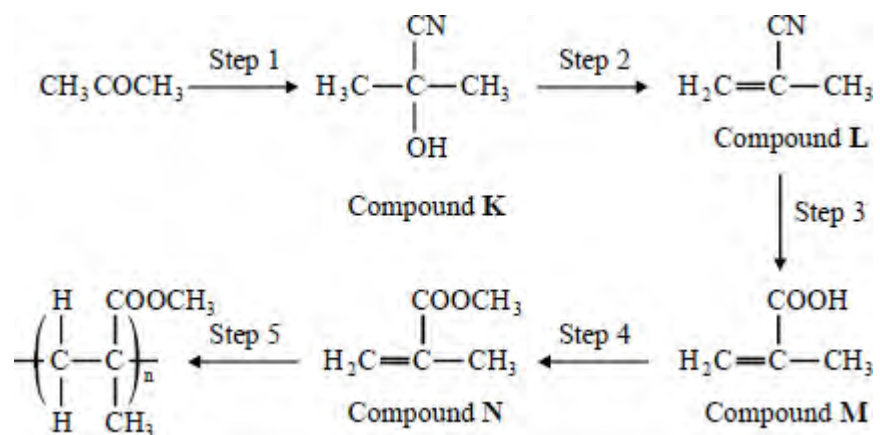


Which one of the following statements is **not** correct?

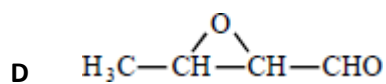
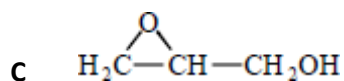
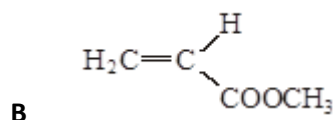
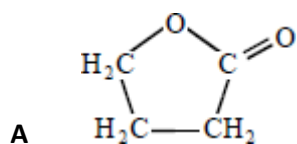
- A **W** and **Y** are structural isomers.
- B **Z** is a primary alcohol.
- C **Y** gives two peaks in its proton n.m.r. spectrum.
- C **X** has geometrical isomers.

(Total 1 mark)

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

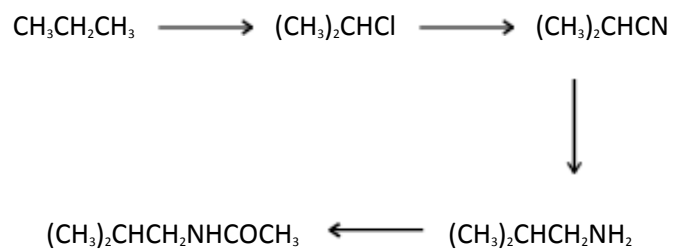


Which one of the following is **not** a structural isomer of Compound **M**?



(Total 1 mark)

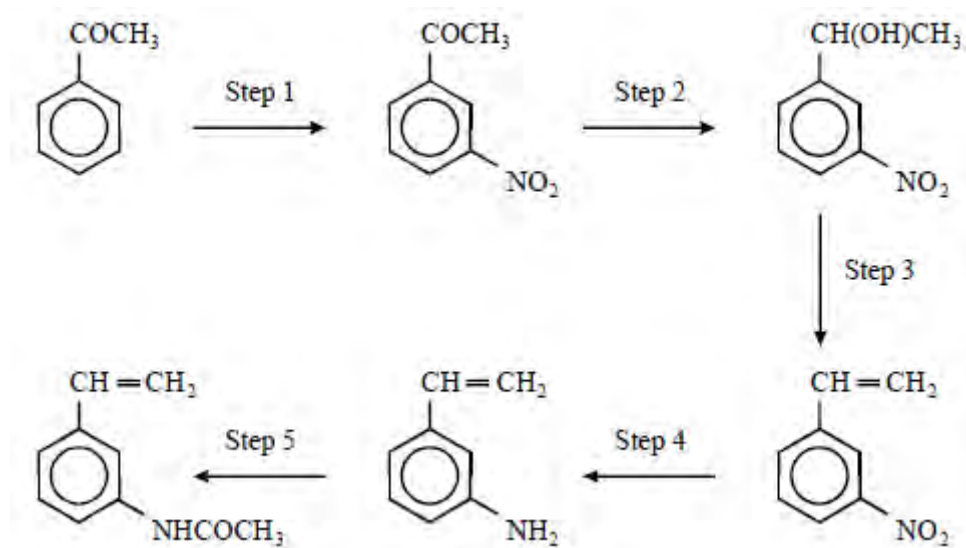
**Q11.** Which one of the following types of reaction mechanism is **not** involved in the above sequence?



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

**(Total 1 mark)**

Q12. Refer to the following reaction sequence:

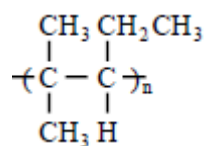


Which one of the following types of reaction mechanism is **not** involved in the above sequence?

- 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

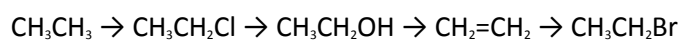
(Total 1 mark)

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

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

(Total 1 mark)

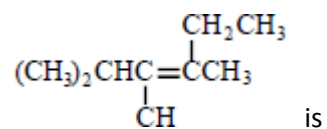
**Q15.** Which one of the following mechanisms is **not** involved in the reaction sequence below?



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

(Total 1 mark)

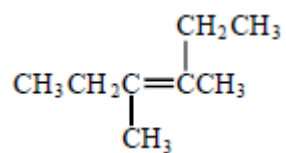
**Q16.** The correct systematic name for



- 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

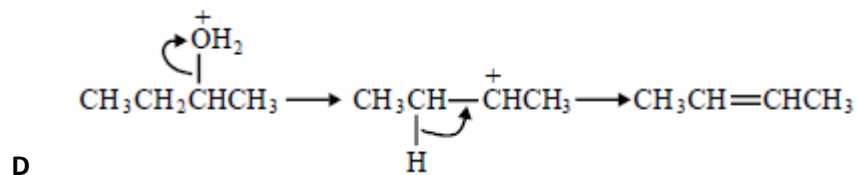
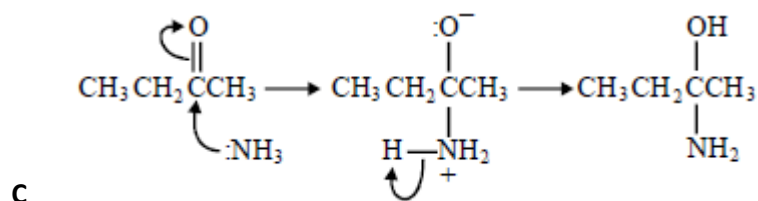
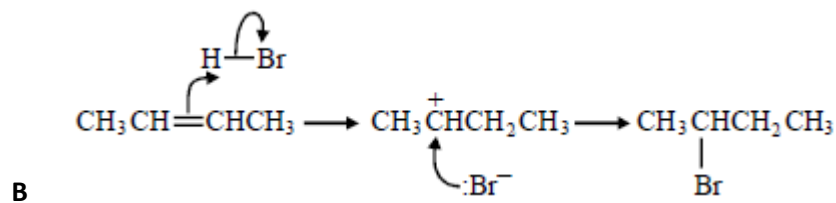
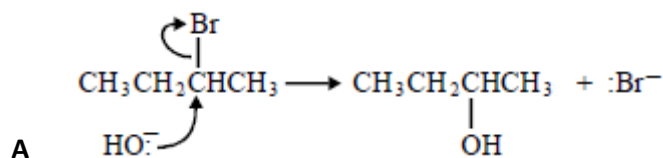
(Total 1 mark)

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?



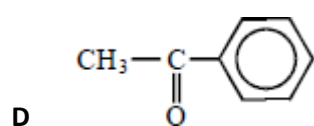
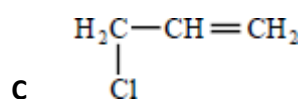
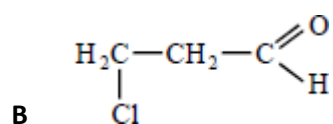
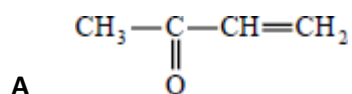
(Total 1 mark)

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

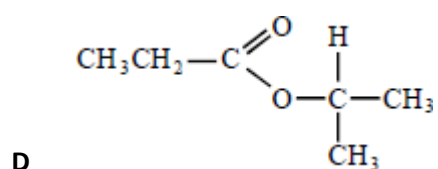
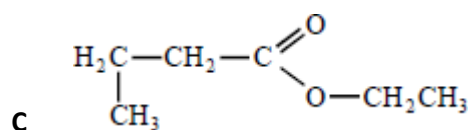
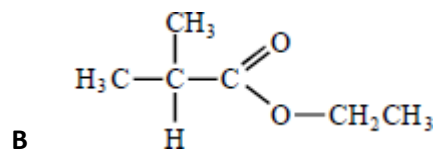
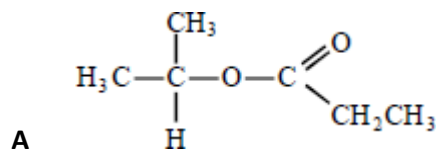
(Total 1 mark)

**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



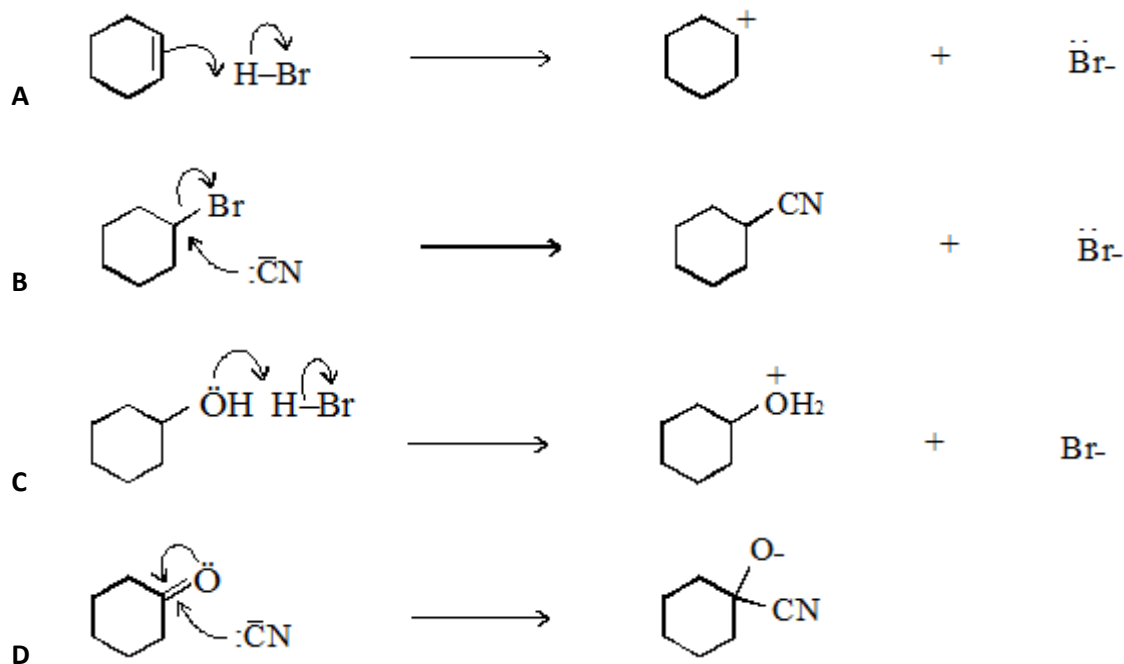
(Total 1 mark)

**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.** CH<sub>2</sub>O 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			
<b>A</b> (i), (ii) and (iii) only	<b>B</b> (i) and (iii) only	<b>C</b> (ii) and (iv) only	<b>D</b> (iv) alone

Isomers of the ester HCOOCH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, 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 C<sub>4</sub>H<sub>9</sub>Br is

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

**(Total 1 mark)**