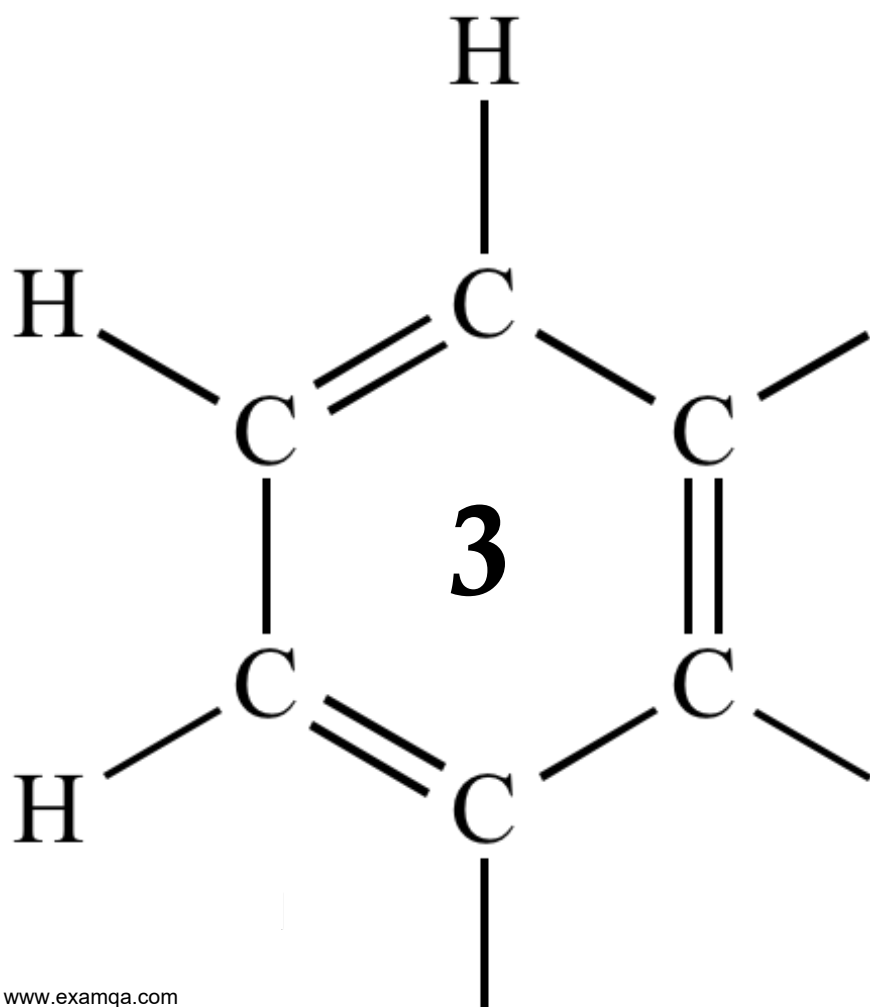


AQA A2 CHEMISTRY
SYNTHESIS ~ ANALYSIS

INTRO TO ORGANIC

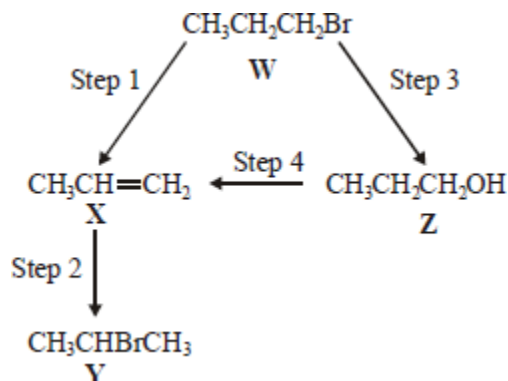


1 Propanone can be reduced to form an alcohol. A functional group isomer of the alcohol formed is

- 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)

2 For this question refer to the reaction scheme below.

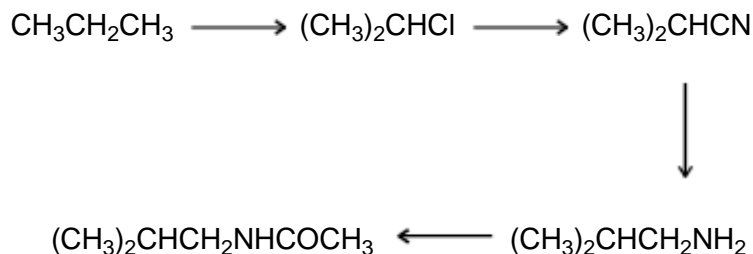


Which one of the following statements is **not** correct?

- 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)

3 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)

4

(a) **P**, **Q** and **R** have the molecular formula C_6H_{12}

All three are branched-chain molecules and none is cyclic.

P can represent a pair of optical isomers.

Q can represent a pair of geometrical isomers.

R can represent another pair of geometrical isomers different from **Q**.

Draw one possible structure for one of the isomers of each of **P**, **Q** and **R**.

Structure of **P**

Structure of **Q**

Structure of **R**

(3)

(b) Butanone reacts with reagent **S** to form compound **T** which exists as a racemic mixture. Dehydration of **T** forms **U**, C_5H_7N , which can represent a pair of geometrical isomers.

(i) State the meaning of the term *racemic mixture* and suggest why such a mixture is formed in this reaction.

Racemic mixture

.....

Explanation.....

.....

.....

(ii) Identify reagent **S**, and draw a structural formula for each of **T** and **U**.

Reagent **S**

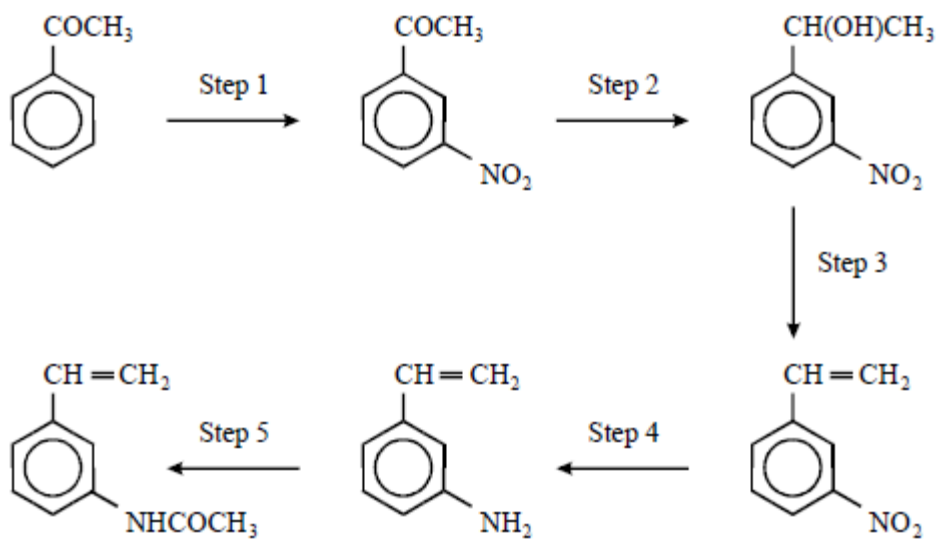
Compound **T**

Compound **U**

(6)
(Total 9 marks)

5

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)

6

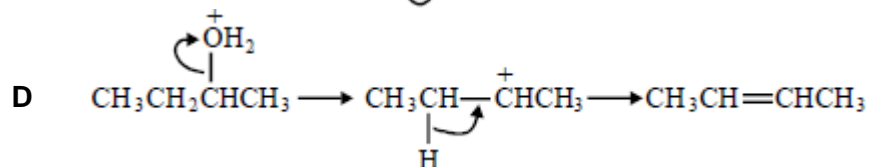
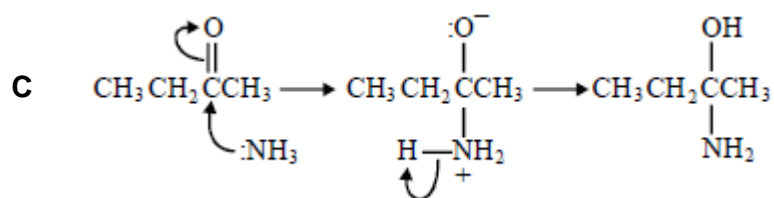
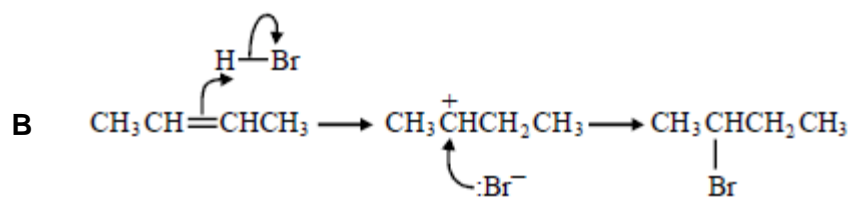
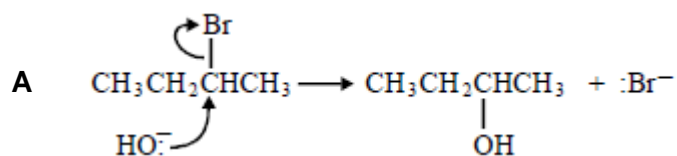
How many structural isomers, which are aldehydes, have the molecular formula $C_5H_{10}O$?

- A 2
 B 3
 C 4
 D 5

(Total 1 mark)

7

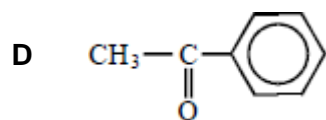
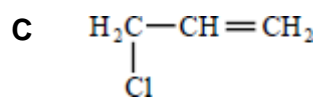
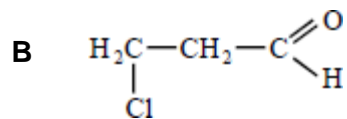
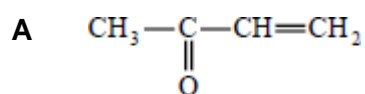
In which of the following is a curly arrow used incorrectly?



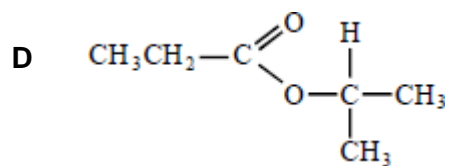
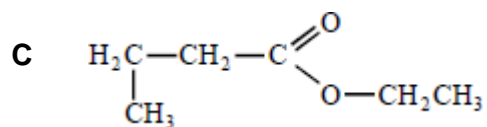
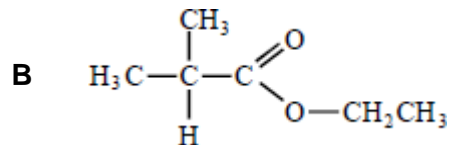
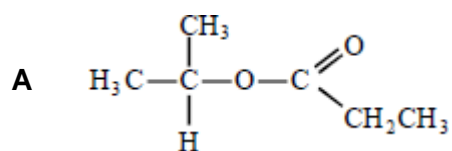
(Total 1 mark)

8

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

**(Total 1 mark)****9**

The structural formula of ethyl 2-methylpropanoate is

**(Total 1 mark)**