

Q1. Which amine has only **three** peaks in its proton NMR spectrum?

- A** Methylamine
- B** Trimethylamine
- C** Diethylamine
- D** Propylamine

(Total 1 mark)

Q2. Which one of the following pairs of reagents reacts to form an organic product that shows only 2 peaks in its proton n.m.r. spectrum?

- A** butan-2-ol and acidified potassium dichromate(VI)
- B** ethanoyl chloride and methanol
- C** propanoic acid and ethanol in the presence of concentrated sulphuric acid
- D** ethene and hydrogen in the presence of nickel

(Total 1 mark)

Q3. Which one of the following pairs reacts to form an organic product with only 2 singlets in its proton n.m.r. spectrum?

- A** ethene and bromine
- B** propan-2-ol and acidified potassium dichromate(VI)
- C** ethanol and concentrated sulphuric acid
- D** epoxyethane and water in the presence of dilute sulphuric acid

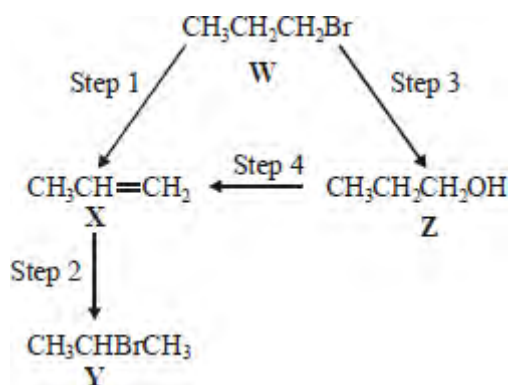
(Total 1 mark)

Q4. Which one of the following does **not** have a singlet peak in its proton n.m.r. spectrum?

- A butyl methanoate
- B propyl ethanoate
- C ethyl propanoate
- C methyl butanoate

(Total 1 mark)

Q5. 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)

Q6. Which one of the following has a singlet peak in its proton n.m.r. spectrum?

- A ethyl propanoate
- B propyl methanoate
- C hexan-3-one
- D 2-chlorobutane

(Total 1 mark)

Q7. Propene reacts with hydrogen bromide to form a mixture of saturated organic products. The proton n.m.r. spectrum of the major organic product has

- A 3 peaks with relative intensities 3 : 2 : 2
- B 2 peaks with relative intensities 3 : 4
- C 3 peaks with relative intensities 3 : 1 : 3
- D 2 peaks with relative intensities 6 : 1

(Total 1 mark)

Q8. How many peaks will be observed in the low-resolution proton n.m.r. spectrum of $(\text{CH}_3)_2\text{CHCOO}(\text{CH}_2)_3\text{CH}_3$?

- A 4
- B 5
- C 6
- D 7

(Total 1 mark)