

1 Which of the following is a tertiary alcohol?

- A 3-methylbutan-2-ol
- B 2-methylbutan-2-ol
- C 2-methylbutan-1-ol
- D 2,2-dimethylpropan-1-ol

**(Total for Question = 1 mark)**

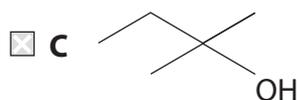
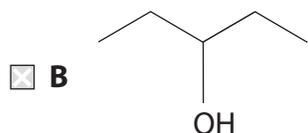
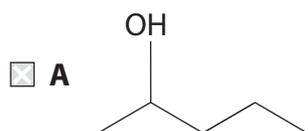
2 When sodium is added to ethanol, which of the following observations would be

made?

- A Colour change of orange to green
- B Effervescence
- C Yellow flame
- D No change

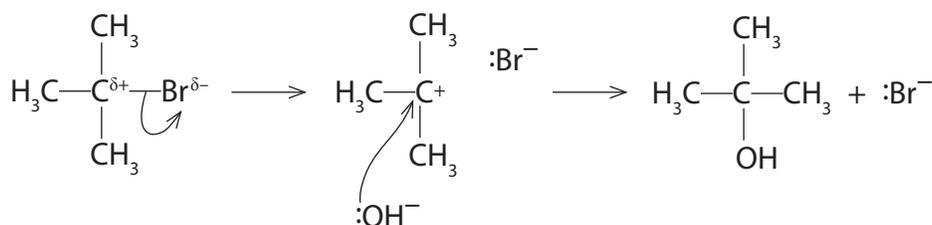
**(Total for Question = 1 mark)**

3 Which of the following isomeric alcohols, with molecular formula  $C_5H_{12}O$ , can be oxidized to a carboxylic acid with five carbon atoms?



(Total for Question = 1 mark)

4 A reaction mechanism is shown below.



The hydroxide ion is acting as

- A an electrophile.
- B a catalyst.
- C a free radical.
- D a nucleophile.

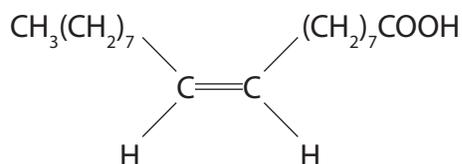
(Total for Question = 1 mark)

5 Which of the following reagents gives a **positive** result with a tertiary alcohol?

- A Acidified potassium dichromate(VI) solution
- B Phosphorus(V) chloride
- C Dilute sulfuric acid
- D Bromine water

**(Total for Question = 1 mark)**

6 The formula for oleic acid, which is present in fingerprints, is shown below.



(a) The systematic name for oleic acid is

(1)

- A *E*-octadec-9-enoic acid.
- B *Z*-octadec-9-enoic acid.
- C *E*-octadec-8-enoic acid.
- D *Z*-octadec-8-enoic acid.

(b) Which intermolecular forces are present between oleic acid molecules?

(1)

- A Hydrogen bonds only.
- B Hydrogen bonds and permanent dipole-dipole forces only.
- C Hydrogen bonds, permanent dipole-dipole forces and London forces.
- D Hydrogen bonds and London forces only.

(c) Which of the following species is most likely to cause a peak at  $m/e = 45$  in the mass spectrum of oleic acid?

(1)

- A  $\text{CH}_2\text{CH}_2\text{OH}$
- B  $\text{CH}_2\text{CH}_2\text{OH}^+$
- C  $\text{COOH}$
- D  $\text{COOH}^+$

(d) What would you expect to see if oleic acid is tested separately with bromine water and with phosphorus(V) chloride,  $\text{PCl}_5$ ?

(1)

	Bromine water	Phosphorus(V) chloride, $\text{PCl}_5$
<input type="checkbox"/> A	Decolorises	Steamy fumes
<input type="checkbox"/> B	No colour change	No visible change
<input type="checkbox"/> C	Decolorises	No visible change
<input type="checkbox"/> D	No colour change	Steamy fumes

7 Which of the following could be used to oxidize ethanol to ethanoic acid?

- A Concentrated  $\text{H}_2\text{SO}_4$
- B  $\text{H}^+/\text{Cr}_2\text{O}_7^{2-}$
- C  $\text{H}^+/\text{Cr}^{3+}$
- D Concentrated NaOH solution

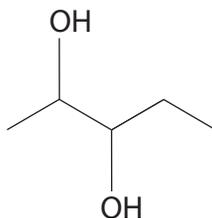
**(Total for Question = 1 mark)**

8 The term "reflux" is best described as

- A continuous evaporation and condensation.
- B heating to evaporation and separation.
- C heating under reduced pressure and separation.
- D constant boiling.

**(Total for Question = 1 mark)**

9 The alcohol shown below can be classified as



- A just primary.
- B primary and secondary.
- C just secondary.
- D secondary and tertiary.

**(Total for Question = 1 mark)**

10 Propan-1-ol and propan-2-ol are separately oxidized under mild conditions by acidified sodium dichromate(VI) and the product immediately distilled off. What is the oxidation product in each case?

		Propan-1-ol	Propan-2-ol
<input type="checkbox"/>	A	propanal	propanone
<input type="checkbox"/>	B	propanoic acid	propanone
<input type="checkbox"/>	C	propanal	propanoic acid
<input type="checkbox"/>	D	propanone	propanal

**(Total for Question = 1 mark)**

11 The best method of converting ethanol,  $C_2H_5OH$ , into iodoethane,  $C_2H_5I$ , is to

- A heat iodine and ethanol under reflux.
- B react ethanol and potassium iodide in the presence of dilute acid.
- C heat potassium iodide and ethanol with concentrated sulfuric acid.
- D heat red phosphorus, ethanol and iodine under reflux.

**(Total for Question = 1 mark)**

12 Which of these compounds would **not** react when heated with a mixture of potassium dichromate(VI) and sulfuric acid?

- A  $\text{CH}_3\text{OH}$
- B  $\text{CH}_3(\text{CH}_2)_2\text{OH}$
- C  $(\text{CH}_3)_2\text{CHOH}$
- D  $(\text{CH}_3)_3\text{COH}$

(Total for Question = 1 mark)

13 Which of the following is a **secondary** alcohol?

- A 2-methylpentan-3-ol
- B 2-methylpropan-2-ol
- C 2,2-dimethylpropan-1-ol
- D ethane-1,2-diol

(Total for Question = 1 mark)

14 Which of the following is a secondary alcohol?

- A butan-1-ol
- B butan-2-ol
- C 2-methylpropan-1-ol
- D 2-methylpropan-2-ol

(Total for Question = 1 mark)

15 When chloroethane is heated with a concentrated solution of potassium hydroxide in **ethanol**, the reaction which occurs is

- A substitution.
- B elimination.
- C hydrolysis.
- D redox.

**(Total for Question = 1 mark)**

16 Chloroethane reacts with **aqueous** potassium hydroxide solution, producing ethanol as the organic product.

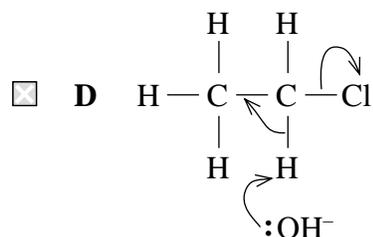
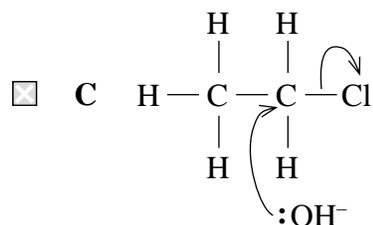
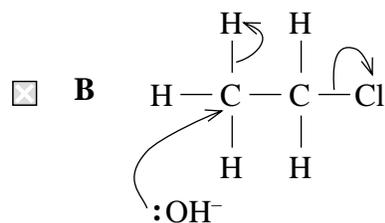
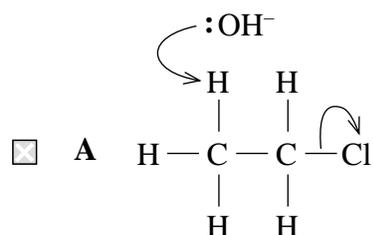
(a) The hydroxide ion is acting as

(1)

- A an electrophile.
- B a nucleophile.
- C an oxidizing agent.
- D a reducing agent.

(b) Which of the following shows the correct electron-pair movements in this reaction?

(1)



(Total for Question = 2 marks)