IGCSE Organic chemistry and Polymers MCQs

1.Why is ethanol a member of the homologous series of alcohols but propane is not?

A Ethanol has two carbon atoms per molecule but propane has three.

B Ethanol can be made from ethene but propane is obtained from petroleum.

C Ethanol is a liquid but propane is a gas.

D Ethanol contains the same functional group as other alcohols but propane does not.

2. Chlorine reacts with methane.

Which statements are correct?

1 The reaction takes place in the dark.

2 The reaction of chlorine with methane forms chloromethane.

3 Chloromethane reacts with chlorine to produce dichloromethane.

4 The reaction of chlorine with methane is an addition reaction.

A 1 and 2 B 1 and 3 C 2 and 3 D 3 and 4

3. Which statements about aqueous ethanoic acid are correct?

1 Ethanoic acid contains the functional group –COOH.

2 Ethanoic acid reacts with carbonates to produce hydrogen.

3 Ethanoic acid turns Universal Indicator paper blue.

4 Ethanoic acid has a pH lower than pH 7.

A 1 and 2 B 1 and 3 C 1 and 4 D 2 and 4

4. The structure of an ester is shown.

$CH_3COOCH_2CH_2CH_3$

What is the name of the ester?

A ethyl propanoate

B methyl propanoate

C propyl ethanoate

D propyl methanoate

5. Which statement about homologous series is not correct?

A All homologous series are hydrocarbons.

B Members of a homologous series have the same functional group.

C Members of a homologous series have similar chemical properties.

D The alkanes are an example of a homologous series.

6. In bright sunlight, ethane and chlorine combine in substitution reactions.

Which compound is not formed in these reactions?

A C_2H_3Cl **B** C_2H_5Cl **C** $C_2H_4Cl_2$ **D** HCl

7. Which type of reaction takes place when methane reacts with chlorine in the presence of ultraviolet light?

A addition

B cracking

C polymerisation

D substitution

8. Which statement about aqueous ethanoic acid is correct?

A It reacts with metal carbonates to form salts, hydrogen and water.

B It reacts with metal oxides to form salts and oxygen.

C It reacts with reactive metals to form salts and hydrogen.

D It turns damp red litmus paper blue.

9. Some of the fractions obtained from the fractional distillation of petroleum are used as fuels for

vehicles.

Which two fractions are used as fuels for vehicles?

A bitumen fraction and gasoline fraction

B bitumen fraction and naphtha fraction

C gasoline fraction and kerosene fraction

D kerosene fraction and lubricating fraction

10. X, Y and Z are three hydrocarbons.

X $CH_2=CH_2$ Y $CH_3–CH=CH_2$ Z $CH_3–CH_2–CH=CH_2$
What do compounds X, Y and Z have in common?

1 They are all alkenes.

2 They are all part of the same homologous series.

3 They all have the same boiling point.

A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

11. Which pair of compounds can be used to prepare $CH_3CH_2COOCH_2CH_3$?
A ethanoic acid and ethanol
B ethanoic acid and propanol
C propanoic acid and ethanol
D propanoic acid and propanol

12. Ethanol is produced by fermentation or from ethene.

What is a disadvantage of producing ethanol by fermentation?

A Distillation is needed to purify the ethanol produced.

B Fermentation uses glucose from plants.

C Fermentation is catalysed by enzymes in yeast.

D Fermentation occurs at a low temperature and pressure.

13. Which structural formula represents methyl propanoate?

A $CH_3CH_2COOCH_3$

B $CH_3COOCH_2CH_2CH_3$

C $CH_3CH_2CH_2COOCH_3$

D $HCOOCH_2CH_2CH_3$

14. Which substances can be obtained by cracking hydrocarbons?

A ethanol and ethene

B ethanol and hydrogen

C ethene and hydrogen

D ethene and poly(ethene)

15. Which reaction is not a reaction which alkenes undergo?

A bromination

B hydration

C hydrogenation

D hydrolysis

16. What is not the correct use of the fraction named?

name of fraction	use
A fuel oil	making waxes
B gas oil	fuel in diesel engines
C kerosene	jet fuel
D naphtha	making chemicals

17. Which two compounds react together to form a condensation polymer?

A $HOCH_2CH_2OH$ and CH_3COOH

B $HOCH_2CH_2OH$ and CH_3NH_2

C $HOCH_2CH_2OH$ and $H_2NCH_2CH_2NH_2$

D $HOCH_2CH_2OH$ and $HOOCCH_2CH_2COOH$

18. What is the name of the organic product of the reaction shown?

$CH_3COOH + CH_3CH2OH \rightarrow$

A ethyl ethanoate

B ethyl methanoate

C methyl ethanoate

D methyl propanoate

19. Two processes used for the large-scale production of ethanol are shown.

process 1 A compound containing carbon, hydrogen and oxygen is used to produce ethanol.

process 2 A compound containing carbon and hydrogen only is used to produce ethanol.

Which statement is correct?

A Process 1 uses a renewable starting material.

B Process 1 is done at a very high temperature.

C Process 2 involves fermentation.

D Process 2 is done at room temperature.

20. Which substances can be obtained by cracking hydrocarbons?

A ethanol and ethene

B ethanol and hydrogen

C ethene and hydrogen

D ethene and poly(ethene)

21. Which statement about alkenes is not correct?

A They decolourise aqueous bromine.

B They only contain the elements carbon and hydrogen.

C They react with hydrogen to form alkanes.

D They react with steam to produce carboxylic acids.

22. Which esters have the molecular formula $C_5H_{10}O_2$?

1 ethyl propanoate

2 propyl ethanoate

3 butyl methanoate

4 methyl butanoate

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 1 and 2 only

D 3 and 4 only

23. Methane, ethane and propane belong to a family of hydrocarbons called alkanes.

What is the general formula of an alkane?

A C_nH_{2n} B C_nH_{2n+1} C C_nH_{2n-1} D C_nH_{2n+2}

24. Which row describes an advantage and a disadvantage of making ethanol by fermentation?

	advantage	disadvantage
A	uses a renewable resource	occurs at a slow rate
B	needs a high temperature	produces impure ethanol as a product
C	produces pure ethanol as a product	needs a high temperature
D	occurs at a slow rate	uses a non-renewable resource

24. Keratin is a protein that is found in human hair.

Keratin is chemically broken down to produce amino acids.

What is the name of this chemical process?

A catalysis

B hydration

C hydrolysis

D polymerization

25. Ethanol is manufactured by fermentation or by the catalytic addition of steam to ethene.

Which statement is correct?

A Fermentation uses a higher temperature than the catalytic addition of steam to ethene.

B Fermentation uses a non-renewable resource.

C The catalytic addition of steam to ethene produces purer ethanol than fermentation.

D The catalytic addition of steam to ethene uses a biological catalyst.

26. Which fraction of petroleum is not matched to its correct use?

fraction	use
A bitumen	making roads
B gasoline	fuel for cars
C kerosene	fuel for ships
D naphtha	chemical industry

27. Polyesters and polyamides are types of synthetic polymer.

Which statements are correct?

1 They are made by addition polymerisation.

2 They are made by condensation polymerisation.

3 The monomers from which they are made are unsaturated hydrocarbons.

4 The monomers from which they are made contain reactive functional groups at their ends.

A 1 and 3 B 1 and 4 C 2 and 3 D 2 and 4

28. Ethanol is manufactured by fermentation or by the catalytic addition of steam to ethene.

What is an advantage of ethanol manufacture by fermentation instead of by the catalytic addition

of steam to ethene?

A Ethanol manufactured by fermentation is purified by distillation.

B Ethanol manufacture by fermentation produces purer ethanol.

C Ethanol manufacture by fermentation uses large areas of land.

D Ethanol Which statement about homologous series is not correct?

29. A Alkenes have the same general formula, C_nH_{2n+2}.

B Each member of the homologous series of alkanes differs from the next by CH_2.

C The members of a homologous series all have similar chemical properties.

D The members of a homologous series all have the same functional group.
manufacture by fermentation uses renewable resources.

30. How can the amino acids in a protein be separated and identified?

A Add a locating agent to the protein.

B Hydrolyse the protein and then use chromatography.

C Polymerise the protein and then add a locating agent.

D Use chromatography on a solution of the protein.

31. Butane and methylpropane are isomers with molecular formula C_4H_{10}.

Which statements are correct?

1 They have similar chemical properties.

2 They have the same general formula.

3 They have the same structural formula.

A 1, 2 and 3 B 1 and 2 only C 1 and 3 only D 2 and 3 only

32. By which of the following methods is ethanol formed?

1 fractional distillation of petroleum

2 fermentation

3 catalytic addition of steam to ethene

A 1 and 2 only

B 1 and 3 only

C 2 and 3 only

D 1, 2 and 3

33. Which statements are correct for ethanoic acid?

1 It contains a carbon-oxygen double bond.

2 It contains two carbon atoms.

3 It decolourises bromine water.

4 It contains an –OH group.

A 1 and 2 only

B 1 and 3

C 1, 2 and 4

D 2, 3 and 4

34. Which statement about alkane molecules is correct?

A They burn in oxygen.

B They contain carbon, hydrogen and oxygen atoms.

C They contain double bonds.

D They contain ionic bonds.

35. Which statement about petroleum is not correct?

A It can be separated into useful substances by fractional distillation.

B It consists mainly of hydrocarbons.

C It is found underground in many parts of the world.

D Its main use is for making lubricants and polishes.

36. Ethanol is manufactured from petroleum by reacting ethene with steam.

Which statements about this process are correct?

1 Ethene is obtained from the cracking of alkanes.

2 The process is carried out in the presence of yeast.

3 The reaction is an addition reaction.

4 The rate of reaction is increased by a catalyst.

A 1 and 3 only B 1 and 4 only C 1, 2 and 3 D 1, 3 and 4

37. Which statement describes the compound shown below?

CH_3COOH

A It is a colourless flammable gas.

B It is a liquid which decolourises bromine water.

C It is a liquid with a characteristic smell.

D It is formed when ethane reacts with steam.

38. Ethene, propene and butene are all members of the same homologous series.

Which statement explains why ethene, propene and butene have similar chemical properties?

A They all have the same functional group.

B They are all gases at room temperature.

C They are all hydrocarbons.

D They are all organic.

39. Which statement about the names of organic compounds is correct?

A Compounds containing C=C double bonds are alkanes.

B The compound of formula CH_3CO_2H is methanoic acid.

C The compound of formula C_2H_4 is ethane.

D The compound of formula C_2H_5OH is an alcohol.

40. A solution of ethanol and water is left to stand in an open beaker in a warm room for three weeks.

Which statement explains what happens to the ethanol in the solution?

A The ethanol is dehydrated to ethene.

B The ethanol is hydrolysed to ethene.

C The ethanol is oxidised to ethanoic acid.

D The ethanol is reduced to ethanoic acid.

41. Which two compounds are molecules which both contain a double bond?

A ethane and ethanoic acid

B ethane and ethanol

C ethene and ethanoic acid

D ethene and ethanol

42. Which equation representing a reaction of methane is correct?

A $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$

B $CH_4 + Cl_2 \rightarrow CH_4Cl_2$

C $CH_4 + Cl_2 \rightarrow CH_2Cl_2 + H_2$

D $2CH_4 + 2Cl_2 \rightarrow 2CH_3Cl + Cl_2 + H_2$

43. Which reaction can be used to make ethanoic acid?

A oxidation of ethanol

B oxidation of ethene

C reduction of ethanol

D reduction of ethane

44. Ethanol is manufactured from ethene.

What is an advantage of this process?

A It is a continuous process.

B It has high labour costs.

C It needs high temperature and pressure.

D It uses non-renewable materials.

45. Which statement about ethanoic acid is correct?

A It contains a –C2H5 group.

B It is a strong acid.

C It is formed by the reduction of ethanol.

D It reacts with alcohols to form esters.

46. Sugar can be fermented to produce ethanol.

Some of the stages in the process to produce and purify ethanol are listed.

1 Leave in a warm place.

2 Add yeast.

3 Fractionally distil the solution.

4 Dissolve the sugar in water.

5 Filter to remove the yeast.

6 Crush some sugar cane.

What is the correct order of these stages?

A 4 → 6 → 2 → 1 → 5 → 3

B 6 → 4 → 1 → 2 → 5 → 3

C 6 → 4 → 2 → 1 → 3 → 5

D 6 → 4 → 2 → 1 → 5 → 3

47. The structure of an ester is shown.

CH_3CH_2 COO CH_2CH_3

Which substances react to form this ester?

A ethanol and ethanoic acid

B ethanol and propanoic acid

C propanol and ethanoic acid

D propanol and propanoic acid

48. Which statement is not correct?

A Petroleum is a mixture of hydrocarbons.

B The main constituent of natural gas is ethane.

C The naphtha fraction of petroleum is used for making chemicals.

D When natural gas burns in air, carbon dioxide and water are formed.

49. The structure of compound R is shown.

$CH_3CH_2CH_2OH$

What is R?

A propane

B propanoic acid

C propanol

D propene

50. Ethanol is a fuel used in cars. It can be made from petroleum.

$C4H10 \rightarrow C2H4 + C2H6$ cracking

$C2H4 + H2O \rightarrow C2H5OH$ producing ethanol

$C2H5OH + 3O2 \rightarrow 2CO2 + 3H2O$ burning

Compounds of how many homologous series appear in these equations?

A 1 B 2 C 3 D 4