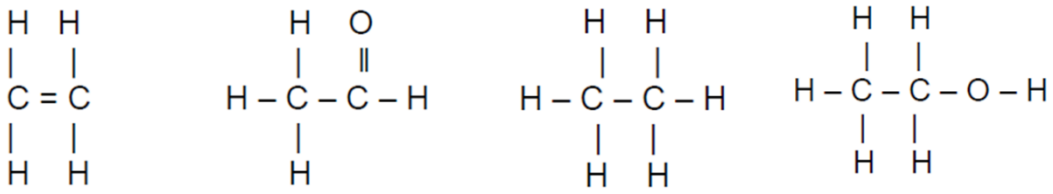
MULTIPLE CHOICE QUESTIONS

1. Which one of the following compounds will decolourise bromine water the fastest under normal conditions?



A. **B.** **C.** **D.**

2. The reaction represented by the equation below takes place in the presence of a catalyst

$$C_{13}H_{28}(l) \rightarrow C_2H_4(g) + C_3H_6(g) + C_8H_{18}(l)$$

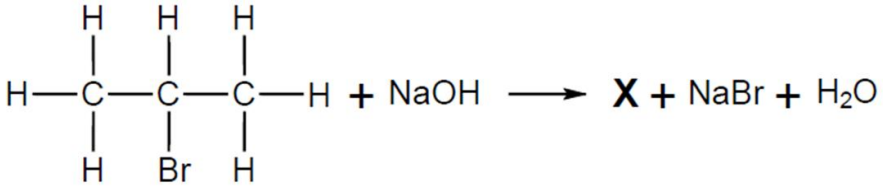
This reaction is an example of ….

A. addition
B. cracking
C. substitution
D. polymerisation

3. Which ONE of the following hydrocarbons always gives a product with the same IUPAC name when ANY ONE of its hydrogen atoms is replaced with a chlorine atom?

A. Hexane
B. Hex-1-ene
C. Cyclohexane
D. Cyclohexene

4. The equation below represents the reaction that takes place when an organic compound and concentrated sodium hydroxide are strongly heated. X represents the major organic product formed.



Which ONE of the following is the correct IUPAC name for compound X?

A. Prop-1-ene
B. Prop-2-ene
C. Propan-1-ol
D. Propan-2-ol

5. Which ONE of the following polymers is the product of a condensation polymerisation reaction?

A. Polypropylene
B. Polyvinyl chloride
C. Polytetrafluoroethene
D. Polyactic acid

Section B: Exam practice questions

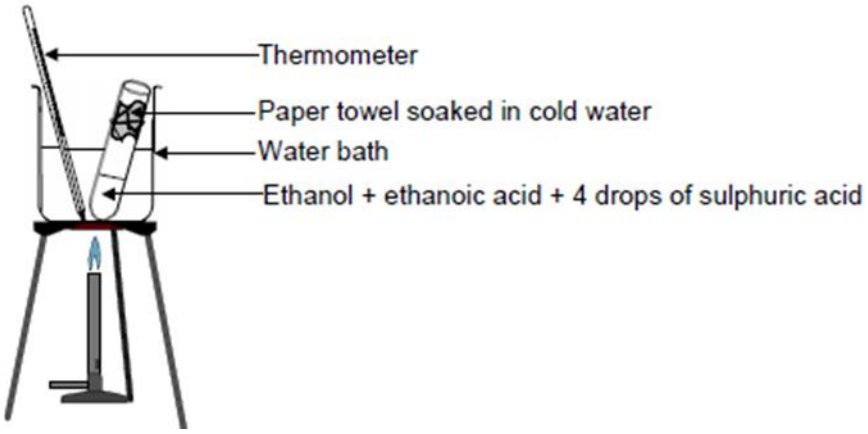
Question 1

(Taken from Feb – March 2010)

Many of the flavours and odours of fruits are esters. Ethyl ethanoate is the most common ester found in wines and contributes to the perception of the fruitiness of wines.

A learner wants to prepare ethyl ethanoate in the school laboratory. She follows the instructions below.

- Mix 1 cm^3 ethanoic acid and 1 cm^3 ethanol thoroughly in a test tube
- Slowly add 4 drops of concentrated sulphuric acid while swirling the test tube
- Soak a paper towel in cold water and fasten it around the test tube close to its mouth with an elastic band
- Place the test tube in a water bath and heat the water with a flame to a temperature of about 60^oC
- Leave the test tube in the hot water bath for about 15 minutes
- Cool the test tube by placing it in a beaker of cold water
- Smell the vapour in the test tube after 10 minutes



1.1. To which homologous series does ethanol belong? (1)

1.2. Use structural formulae to write a balanced equation for the reaction taking place in the test tube. (5)

1.3. What is the function of the sulphuric acid in the above reaction? (1)

1.4. Why does the method use a water bath instead of direct heating over an open flame? (1)

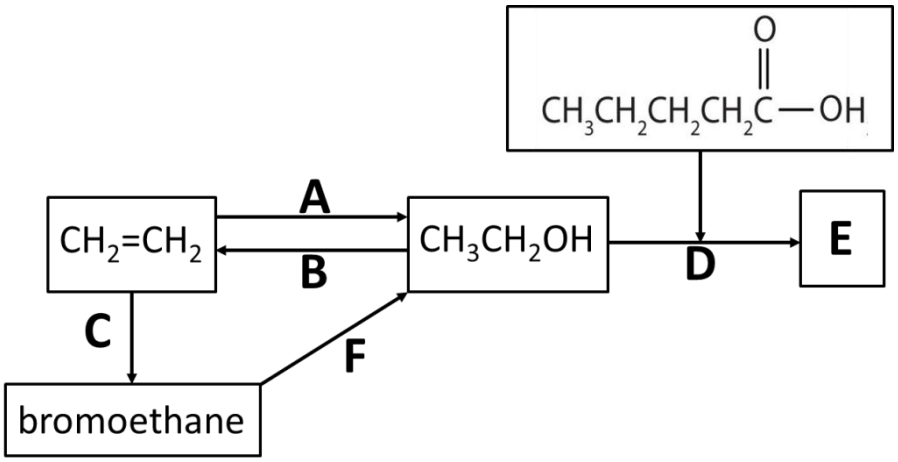
1.5. State ONE function of the wet paper towel at the top of the test tube. (1)

[9]

Question 2

(Taken from Gauteng Preparatory Exam 2010)

The letters **A – F** in the flow diagram below, represent types of organic reactions.



2.1. Name the type of reaction (addition, substitution or elimination) represented by

2.1.1. B (1)

2.1.2. F (1)

2.2. Both A and C represent addition reactions. Name the type of addition reaction represented by:

2.2.1. A (1)

2.2.2. C (1)

2.3. Reaction A represents the conversion of an alkene to an alcohol. Apart from the alkene, another reactant and a catalyst are needed. Write down the NAME of this

2.3.1. reactant (1)

2.3.2. catalyst (1)

2.4. Use structural formulae and write down a balanced chemical equation for the reaction represented by C. (4)

2.5. Reaction D represents the conversion of the alcohol to compound E. Write down the…

2.5.1. NAME given to this type of reaction. (1)

2.5.2. FORMULA of the catalyst added. (1)

2.5.3. Structural formula of compound E. (2)

2.5.4. IUPAC name of compound E. (1)

2.6. Apart from the alcohol, write down the NAME of a reactant needed for reaction B to take place. (1)

[16]

Question 3

(Taken from Eastern Cape Preparatory Exam 2014)

The polymerisation of ethene to produce polythene is represented by the equation below:

$$nCH_2 = CH_2 \rightarrow -[CH_2 - CH_2]_n -$$

3.1. Define the term macromolecule (1)

3.2. Classify this type of polymerisation. (1)

3.3. Name TWO industrial uses of polythene. (2)

[4]

Question 4

(Taken from KZN Preparatory Exam 2014)

A manufacturer makes a polymer, polythene from the monomer, ethene by means of addition polymerisation. The polymer produced has an average relative molecular mass of $1,0 \times 10^4$.

4.1. What is meant by the following terms?

4.1.1. monomer (2)

4.1.2. polymerisation (2)

4.2. Write down the equation for the polymerisation of ethene to produce polythene. (3)

4.3. How many monomer units are joined together to give polyethene with a relative molecular mass of $1,0 \times 10^4$? (2)

4.4. Most plastic bags are made from polyethene. Give one negative impact of the use of plastics on the environment. (1)

[10]

Section C: Solutions

Multiple Choice

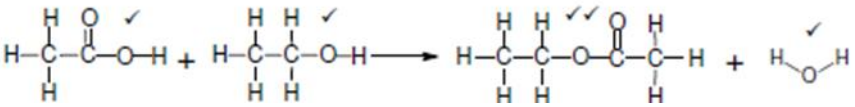
1. A
2. B
3. C
4. D
5. D

Exam Practice Questions

Question 1

1.1. Alcohols ✓ (1)

1.2.



(5)

1.3. Catalyst ✓ (1)

1.4. Ethanol is flammable ✓ (1)

1.5. Prevents the vapours from leaving the test tube. ✓ (1)

Question 2

2.1.1. Elimination✓ (1)

2.1.2. Substitution✓ (1)

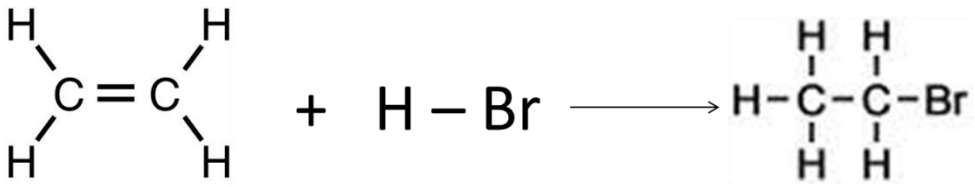
2.2.1. Hydration✓ (1)

2.2.2. Hydrohalogenation✓ (1)

2.3.1. Water✓ (1)

2.3.2. Sulphuric acid ✓OR phosphoric acid (1)

2.4.



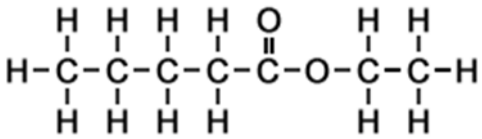
✓✓✓✓

(4)

2.5.1. Esterification ✓ (1)

2.5.2. H_2SO_4 ✓ (1)

2.5.3.



✓✓ (2)

2.5.4. Ethyl pentanoate✓ (1)

2.6. Sulphuric acid ✓ (1)

Question 3

3.1. A molecule containing a large number of atoms✓ (1)

3.2. Addition polymerisation✓ (1)

3.3. Used to make plastic bags,
Make squeeze bottles
Make cling wrap✓✓ (any two) (2)

Question 4

4.1.1. A molecule that can be bonded to other identical molecules to form a polymer molecule✓✓ (2)

4.1.2. The process of converting a monomer into a polymer✓✓ (2)

4.2. $nCH_2 = CH_2 \rightarrow -[CH_2 - CH_2]_n -$✓✓✓ (3)

4.3. $M(C_2H_4) = 2(12) + 4(1)$
$= 28\ g.mol^{1}$

$$number\ of\ monomers = \frac{1 \times 10^4}{28} \checkmark$$
$$= 357{,}14$$

Approximately 357 monomers✓ (2)

4.4. They aren't biodegradable. Fill up landfills etc✓ (1)