

NAME \_\_\_\_\_

**ANSWERS**

Class

Index No

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|---|---|---|
| 0 | 6 | 7 |
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| 6 | 7 |
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**SCIENCE (CHEMISTRY)**

Topical Revision – Organic Chemistry

**5086/5088**

30 minutes

Candidates answer on the Question Paper.

Date: \_\_\_\_\_

Additional Materials: Periodic Table, Data Sheet

**READ THESE INSTRUCTIONS FIRST**Write your class, index number and name on **ALL** the work you hand in

You may use a HB pencil for any drawing.

Write in dark blue or black pen.

Do not use staples, paper clips, glue or correction fluid.

**Section A – Multiple Choice Questions (5 marks)**There are 5 questions in this Section. Answer **ALL** questions. For each question, there are four possible answers **A, B, C** and **D**.

Choose the one you consider correct and write your answer in the given spaces.

Each question scores 1 mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

**Section B – Structured Questions (15 marks)**

Answer ALL questions.

The number of marks is given in the brackets [ ] at the end of each question or part question.

The total marks for this paper is **20**.

| FOR EXAMINERS' USE |              |            |            |
|--------------------|--------------|------------|------------|
|                    | Target marks | Your marks | Full Marks |
| <b>TOTAL</b>       | <b>20</b>    | <b>20</b>  | <b>20</b>  |

Adapted from past year prelim papers

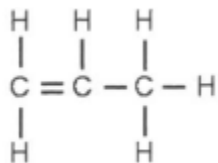
### Section A – Multiple Choice Questions (5 marks)

Write your answers in the given boxes on page 3.

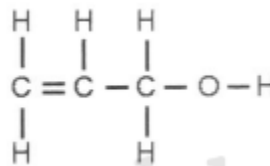
- 1 An organic compound, X, decolourises red-brown aqueous bromine and extinguishes a lighted splint with a 'pop' sound when it reacts with magnesium.

Which of the following is X?

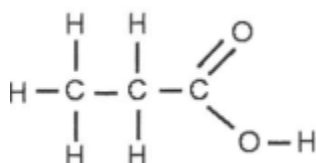
A



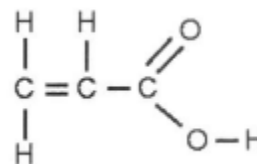
B



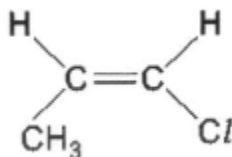
C



D

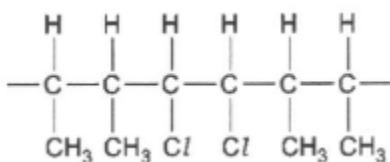


- 2 The structure below shows a monomer.

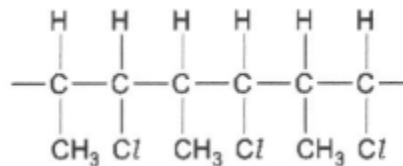


Which of the following shows **three repeating units** of the polymer chain formed?

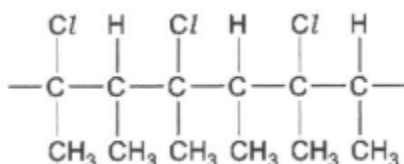
A



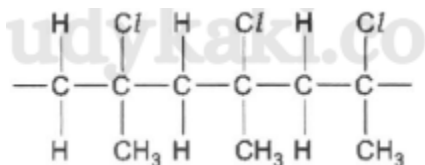
B



C



D





|          | X        | Y        |
|----------|----------|----------|
| <b>A</b> | fraction | monomer  |
| <b>B</b> | monomer  | fraction |
| <b>C</b> | monomer  | polymer  |
| <b>D</b> | polymer  | fraction |

|          |                 |          |                                     |
|----------|-----------------|----------|-------------------------------------|
| <b>A</b> | Aqueous bromine | <b>B</b> | Acidified potassium manganate (VII) |
| <b>C</b> | Limewater       | <b>D</b> | Lighted splint                      |

| Q1 | Q2 | Q3 | Q4 | Q5 |
|----|----|----|----|----|
| D  | B  | B  | C  | B  |

**Section B – 15 marks**Answer **all** questions.

- 6 (a) Naphtha is a fraction of crude oil. Naphtha is processed by cracking in an oil refinery.

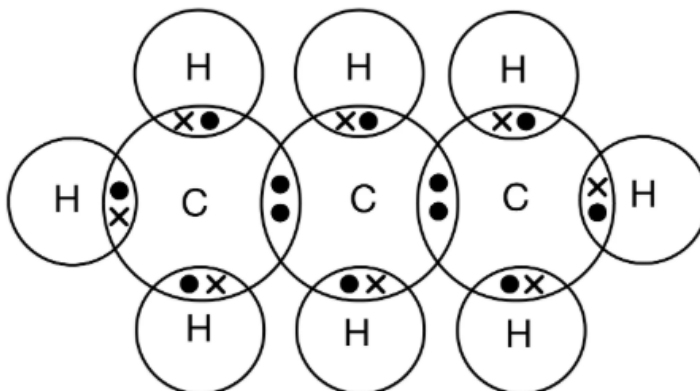
One of the molecules in naphtha is a saturated hydrocarbon X containing 5 carbon atoms. When this molecule is cracked it produces propane,  $C_3H_8$  and one other hydrocarbon Y.

- (i) Why is cracking of naphtha an important process in an oil refinery?

Cracking of naphtha is an important process as hydrocarbons with larger carbon chains can be reduced into hydrocarbons with smaller carbon chains, which is economically more viable.

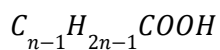
[2]

- (ii) Draw a **dot-and-cross** diagram of propane.



[2]

- (b) Deduce the general formula of the organic compound with a functional formula of  $-COOH$ .



[1]

[Total: 5]

- 7 In Formula One, octane is used as fuel. Octane belongs to a family of organic compounds called alkanes, which is also known as a hydrocarbon.

Table 2.1 shows the melting points and boiling points of a few alkanes.

**Table 2.1**

| Name of alkane | Formula                        | Melting point / °C | Boiling point / °C |
|----------------|--------------------------------|--------------------|--------------------|
| ethane         | C <sub>2</sub> H <sub>6</sub>  | -183               | -89                |
| propane        | C <sub>3</sub> H <sub>8</sub>  | -188               | -42                |
| butane         | C <sub>4</sub> H <sub>10</sub> | -138               | -1                 |
| pentane        | C <sub>5</sub> H <sub>12</sub> | -130               | 36                 |
| hexane         | C <sub>6</sub> H <sub>14</sub> | -95                | 69                 |
| octane         | C <sub>8</sub> H <sub>18</sub> | -57                | 126                |

- (a) What is the type of bonding in octane?

Covalent

[1]

- (b) Describe why a molecule of octane has a low boiling point.

Octane has a simple covalent structure. Small amounts of energy is used to overcome the weak intermolecular forces of attraction between molecules. Thus, octane has a low boiling point.

[3]

- (c) (i) Describe how you would differentiate a sample of octane with a sample of octene.

I would add aq. bromine into both samples.

The sample of octene decolourises the aq. bromine, changing its colour from purple to colourless.

There will not be any observed change for the sample of octane when aq. bromine is added.

[3]

- (ii) Describe how you would differentiate a sample of ethanol with a sample of ethanoic acid.

I would add a few drops of acidified potassium manganate (VII) to both samples.

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The sample of ethanol decolourises the acidified potassium manganate (VII), changing its colour from purple to colourless.

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The sample of ethanoic acid does not decolourise the acidified potassium manganate (VII), hence no colour change.

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[3]

[Total: 10]

[END OF PAPER]