Province of the
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EDUCATION

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NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2026

TECHNICAL SCIENCES P2

MARKS: **75**

TIME: **1 ½ hours**

This question paper consists of 11 pages, including 1 data sheet.

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INSTRUCTIONS AND INFORMATION

1. Write your NAME and SURNAME in the appropriate spaces on the ANSWER BOOK.

2. This question paper consists of FIVE questions. Answer ALL the questions in the ANSWER BOOK.

3. Start EACH question on a NEW page in the ANSWER BOOK.

4. Number the answers correctly according to the numbering system used in this question paper.

5. Leave a line open between two subquestions, for example between QUESTION 2.1 and QUESTION 2.2.

6. You may use a non-programmable calculator.

7. You may use appropriate mathematical instruments.

8. Show ALL formulae and substitutions in ALL calculations.

9. Round off your FINAL numerical answers to a minimum of TWO decimal places.

10. Give brief motivations, discussions, et cetera where required.

11. You are advised to use the attached DATA SHEET.

12. Write neatly and legibly.

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QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1 to 1.5) in the ANSWER BOOK, for example 1.6 A.

1.1 C_nH_{2n-2} is the GENERAL formula for …

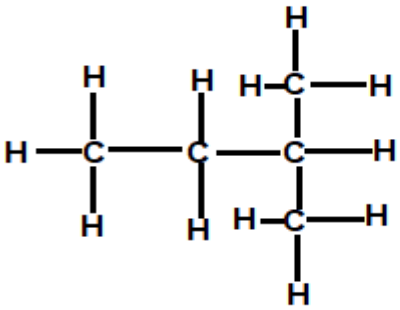
A alkanes.

B alkenes.

C alkynes.

D alcohols. (2)

1.2 Consider the structural formula of the organic compound shown below.



Which ONE of the following is the CORRECT IUPAC name for this compound?

A 2-ethylpropane

B 2-methylbutane

C 3-methylbutane

D 1,1-dimethylpropane (2)

1.3 Which ONE of the following organic compounds has the molecular formula $C_2H_4O_2$?

A Ethanol

B Ethene

C Ethanal

D Ethanoic acid (2)

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1.4 A synthetic material that is derived from organic compounds:

A Polymer

B Polymerisation

C Polyethene

D Plastic (2)

1.5 When a p-n junction diode is reverse biased, the depletion region ...

A narrows.

B widens.

C disappears completely.

D conducts electricity. (2)

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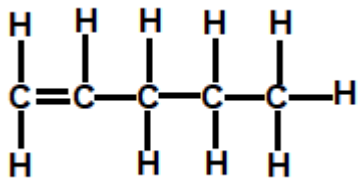
QUESTION 2 (Start on a NEW page.)

Organic molecules are classified into various homologous series according to the functional groups they contain.

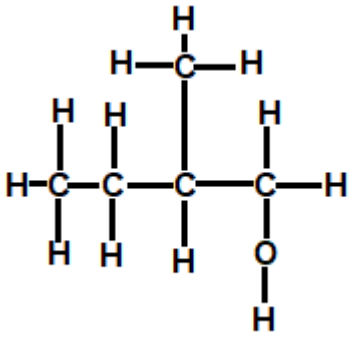
2.1 Define the term *homologous series.* (2)

2.2 Consider the following organic molecules **A** and **B** and answer the questions below.

A



B



Write down the:

2.2.1 Homologous series of compound **A** (1)

2.2.2 Molecular formula of compound **A** (1)

2.2.3 Name of the functional group of compound **B** (1)

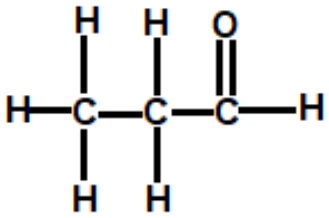
2.2.4 IUPAC name of compound **B** (2)

2.2.5 Letter representing an unsaturated compound. Give a reason for your answer (2)

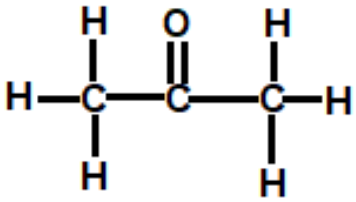
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2.3 Consider the following organic molecules **C** and **D** which are structural isomers and answer the questions below.

C



D



2.3.1 Define the term *structural isomer.* (2)

2.3.2 What type of isomers are compounds **C** and **D**? (1)

2.3.3 Write down the letter of the compound that represents a ketone. (1)

2.3.4 Write down the IUPAC name of compound **C**. (2)

2.3.5 Draw the structural formula of the functional group of compound **C**. (1)

2.4 Draw the structural formula of 2-bromo-3-methylhexane. (3)

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QUESTION 3 (Start on a NEW page.)

The table below shows the boiling points of organic compounds with the same homologous series.

Compound	Name	Boiling point (°C)
A	methane	-161,5
B	ethane	-89
C	propane	-42,1
D	butane	-0,5

3.1 Define the term *boiling point.* (2)

3.2 To which homologous series do these compounds belong to? (1)

3.3 Explain the difference in boiling points of compound **A** and compound **D**. Refer to the INTERMOLECULAR FORCES, CHAIN LENGTH and ENERGY. (3)

3.4 Which of the compounds **A**, **B**, **C** or **D** has the highest viscosity? Give a reason for your answer. (2)

3.5 Which of the compounds **A**, **B**, **C** or **D** has the highest vapour pressure? Give a reason for your answer. (2)

3.6 Predict whether pentane will have a HIGHER or LOWER boiling point than butane. (1)

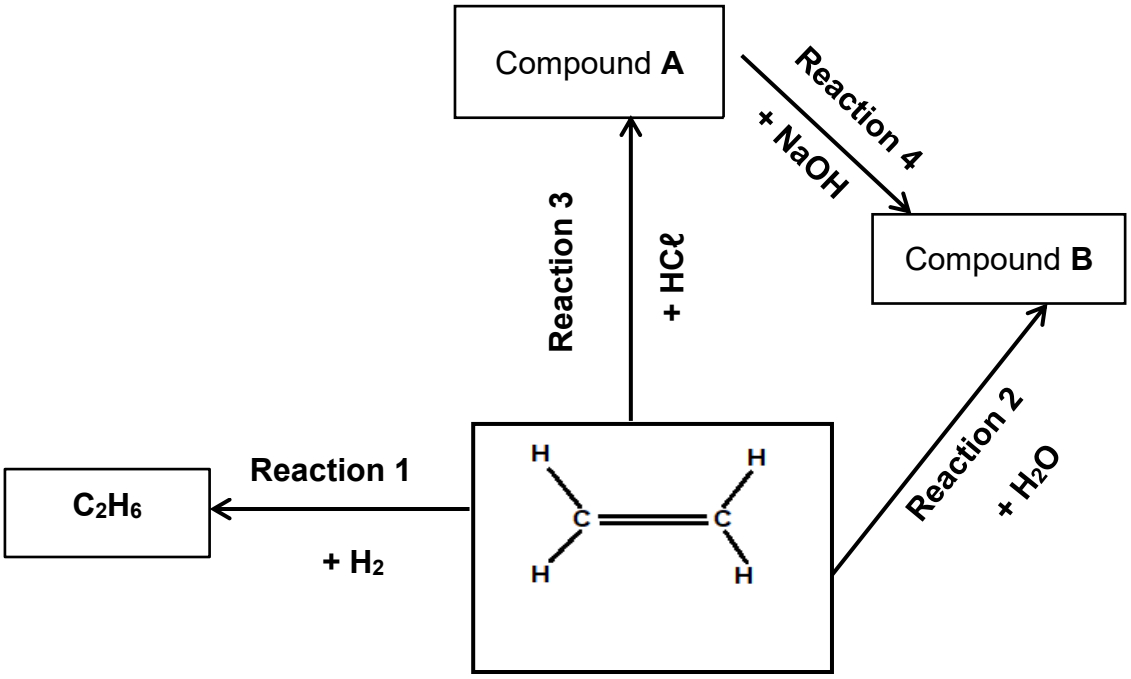
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QUESTION 4 (Start on a NEW page.)

The flow diagram below shows some of the reactions of ethene.



4.1 Name the TYPE of ADDITION reaction represented by:

4.1.1 Reaction **1** (1)

4.1.2 Reaction **2** (1)

4.1.3 Reaction **3** (1)

4.2 For reaction **1**, write down the:

4.2.1 NAME or SYMBOL of one catalyst needed in this reaction (1)

4.2.2 IUPAC name of the product formed (2)

4.3 C_2H_6, used as a fuel in laboratory burners, is burned in excess oxygen.

4.3.1 Name the TYPE of reaction referred to in the above statement. (1)

4.3.2 Write down a balanced molecular equation for the reaction that will occur. (3)

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4.4 In reaction **2,** compound **B** is an alcohol that will be formed.

4.4.1 Draw the structural formula compound **B.** (2)

4.4.2 Is compound **B** a PRIMARY, SECONDARY or TERTIARY ALCOHOL? Give a reason for your answer. (3)

4.5 For reaction **3**, write down:

4.5.1 The IUPAC name of compound **A** (2)

4.5.2 ONE reaction condition for this reaction to occur (1)

4.6 Name the TYPE of reaction that occur in reaction **4**. (1)

4.7 Ethene is used as a monomer in the chemical reaction, called polymerisation, to produce polyethene.

4.7.1 Define the term *polymer*. (2)

4.7.2 Draw the structural formula of polyethene. (2)

4.7.3 Write down TWO industrial uses of polyethene. (2)

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QUESTION 5 (Start on a NEW page.)

Semiconductors play a vital role in everyday life and modern technology, as they are used to make electronic components like diodes, transistors, and integrated circuits that control and amplify electrical signals in devices such as computers and communication systems.

5.1 Define the term *semiconductors*. (2)

5.2 Arsenic is added to silicon during a process called doping.

5.2.1 What type of semiconductor is silicon? (1)

5.2.2 Define the term *doping*. (2)

5.2.3 Explain why doping is done in semiconductors. (2)

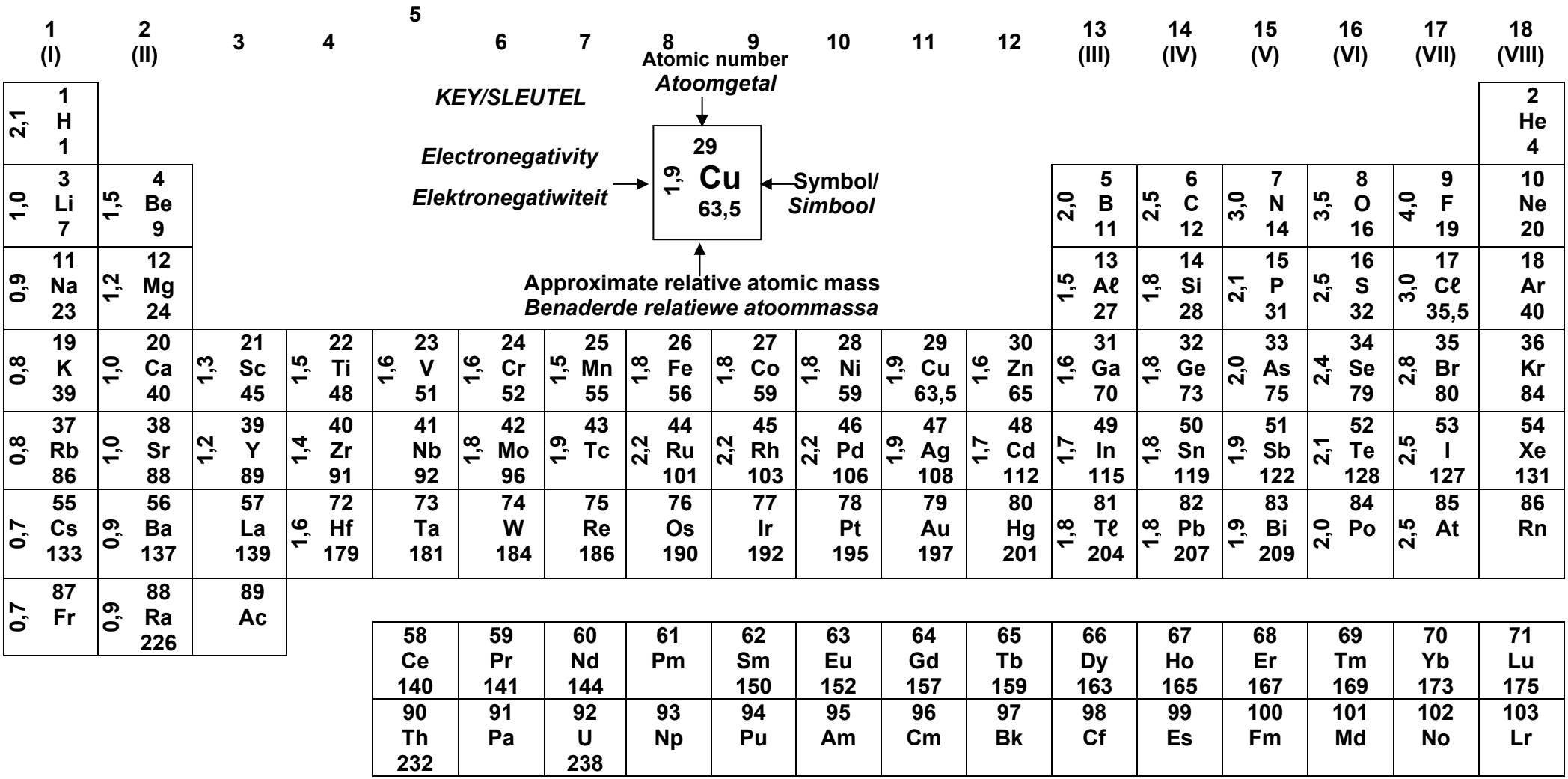
5.2.4 State whether an n-type or p-type semiconductor is produced when arsenic is added to silicon. Give a reason for your answer. (3)

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TOTAL: 75

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THE PERIODIC TABLE OF ELEMENTS/*DIE PERIODIEKE TABEL VAN DIE ELEMENTE*



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