

GRADE 12

**PHYSICAL SCIENCES: CONTROL TEST
(P2)**

MARCH 2018

MEMORANDUM

This memorandum consists of 6 pages

QUESTION 1

- 1.1 A ✓✓ (2)
- 1.2 C ✓✓ (2)
- 1.3 C ✓✓ (2)

[6]**QUESTION 2**

- 2.1
- 2.1.1 B ✓ (1)
- 2.1.2 E ✓ (1)
- 2.1.3 A ✓ (1)
- 2.1.4 G ✓ (1)

2.2

2.2.1 2-bromo-3-chloro-4-methylpentane

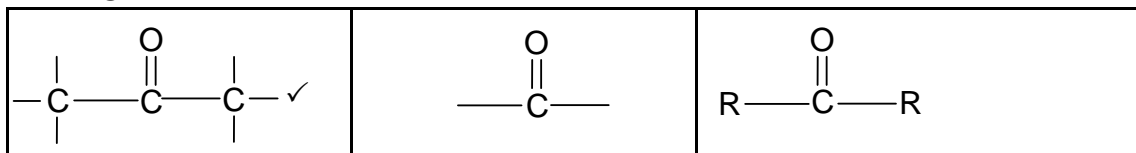
Marking criteria:

- Correct stem i.e. pentane. ✓
- All substituents (chloro, bromo and methyl) correctly identified. ✓
- Substituents correctly numbered, in alphabetical order, hyphens and commas correctly used. ✓

(3)

2.2.2 2-methyl✓propan-1-ol ✓**Notes****IF:**2 methylpropan 1 ol $\frac{1}{2}$

(2)

2.2.3 **ANY ONE:**

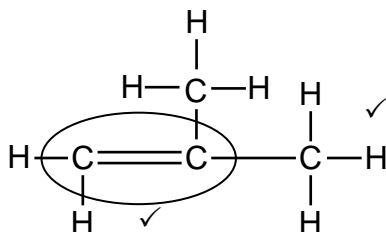
(1)

2.3

2.3.1 Compounds with the same molecular formula✓ but different positions of the functional groups /side chain/substituents on parent chain. ✓

(2)

2.3.2

**Marking criteria:**

- Whole structure correct: $\frac{2}{2}$
- Only functional group correct $\frac{1}{2}$

Notes:

- If two or more functional groups $\frac{0}{2}$
- Condensed or semi-structural formula: Max $\frac{1}{2}$
- Molecular formula: $\frac{0}{2}$

(2)

2.4.1 Esterification (reaction) ✓

(1)

2.4.2 pentyl✓propanoate ✓

(2)

[17]**QUESTION 3**

3.1 The temperature at which the vapour pressure of a substance equals atmospheric pressure ✓✓

(2)

3.2 London forces /Dispersion forces /Induced dipole forces ✓

(1)

- 3.3
- Between molecules of compound **A** are hydrogen bonds✓ and London forces /Dispersion forces / induced dipole forces
 - Between molecules of compound **B** are dipole-dipole✓ forces and London forces
 - Intermolecular forces in compound A are stronger✓ than in **B**

ORIntermolecular forces in compound **B** are weaker than in **A**

(3)

3.4

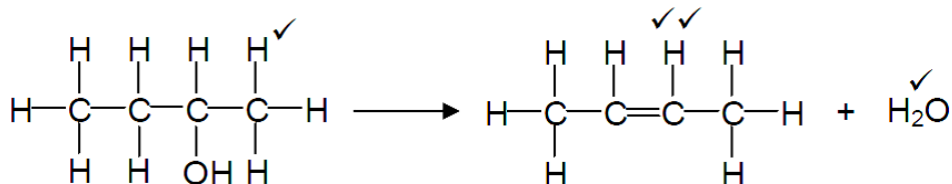
	<u>Marking criteria</u>
$n = \frac{m}{M} \checkmark$ $= \frac{12,8}{16}$ $= 0,8 \text{ mol} \checkmark$ $n_{\text{CH}_4} : n_{\text{CH}_3\text{Cl}} = 1:1 \therefore n_{\text{CH}_2\text{Cl}} = 0,8 \text{ mol}$ $m_{\text{Cu}} = n \times M \checkmark$ $= 0,8 \times 50,5$ $= 40,4 \text{ g}$ $\% \text{ yield} = \frac{35}{40,4} \times 100 \checkmark$ $= 86,63\% \checkmark$	<ul style="list-style-type: none">Formula- $n = \frac{m}{M} \checkmark$0,8 mol ✓Substitution of 50,5g ✓Percentage calculation ✓Answer: 86,63 % ✓

(5)

[11]

QUESTION 4

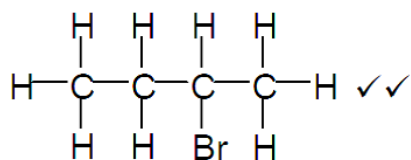
- 4.1 Elimination ✓ (1)
- 4.2 Alkenes ✓ (1)
- 4.3 Addition /Hydrohalogenation /hydrobromination ✓ (1)
- 4.4

Notes

- Condensed/semi-structural formulae or mixture of both: -1 mark
- All bonds shown, one or more H-atoms omitted: -1 mark per structure
- Everything correct, wrong balancing: -1 mark
- Any other reactants or products: -1 mark

(4)

4.5



2-bromobutane ✓

Notes

- Condensed/semi-structural formulae or mixture of both: -1 mark
- All bonds shown, one or more H-atoms omitted: -1 mark per structure
- No hyphen in the name: -1 mark

(3)

4.6 Substitution ✓

(1)

4.7 Cracking ✓

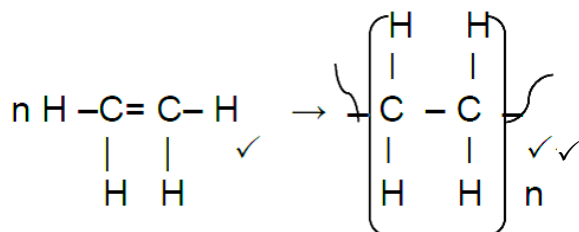
Accept: elimination

(1)

4.8 Addition ✓(polymerisation)

(1)

4.9

**Notes**

- Condensed/semi-structural formulae or mixture of both: -1 mark
- All bonds shown, one or more H-atoms omitted: -1 mark per structure
- Letter n omitted per structure: -1 mark

(3)

[16]**TOTAL: 50**

ANALYSIS GRID

Question No.	Content	Level 1	Level 2	Level 3	Level 4	Total
1.1	Organic reaction		2			
1.2	Physical properties		2			
1.3	Organic reaction		2			
Total			6			6
2.1.1	Homologous series	1				
2.1.2	Functional groups	1				
2.1.3	Homologous series	1				
2.1.4	Homologous series	1				
2.2.1	IUPAC naming			3		
2.2.2	IUPAC naming		2			
2.2.3	Functional groups		1			
2.3.1	Isomerism	2				
2.3.2	Isomerism		2			
2.4.1	Application of organic chemistry	1				
2.4.2	IUPAC naming			2		
Total		7	5	5		17
3.1	Physical properties	2				
3.2	Physical properties		1			
3.3	Physical properties			3		
3.4	Stoichiometry				5	
Total		2	1	3	5	11
4.1.	Organic reactions		1			
4.2.	Organic reactions		1			
4.3	Organic reactions		1			
4.4	Organic reactions				4	
4.5	Organic reactions			3		
4.6	Organic reactions		1			
4.7	Organic reactions	1				
4.8	Plastics and polymers		1			
4.9	Plastics and polymers			3		
Total		1	5	6	4	16
Grand .Total		10	17	14	9	50
Expected marks(policy)		10	17.5	15	7.5	50
Actual %		20%	34%	28%	18%	100%
Expected(poli cy) %		20%	35%	30%	15%	100%