11.1 Introduction to Organic Chemistry

Set A **Foundations**

Name | Time **1 hour** | Total **30 marks** | Score ____ / 30

A Data Booklet may be used.

A From the lesson

10 MARKS

1 Butan-1-ol has M_r 74. What is the M_r of pentan-1-ol? Why do they react in the same way?

.....

..... [2]

/2

Source: Learners' Alley, Introduction to Organic Chemistry slides

2 COMMON For propene, $CH_3CH=CH_2$, state the hybridisation of each C, and the number of σ and π bonds.

.....

..... [2]

/2

Source: Learners' Alley, Introduction to Organic Chemistry slides

3 Define a nucleophile.

..... [1]

/1

Source: Learners' Alley, Introduction to Organic Chemistry slides

4 State the hybridisation and bond angle of C in ethene.

..... [1]

/1

Source: Learners' Alley, Introduction to Organic Chemistry slides

5 What is homolytic fission?

.....

..... **[1]**

/1

Source: Learners' Alley, Introduction to Organic Chemistry slides

6 Name the mechanism: $CH_3Br + CN^- \rightarrow CH_3CN + Br^-$.

..... **[1]**

/1

Source: Learners' Alley, Introduction to Organic Chemistry slides

7 How many stereoisomers does pent-3-en-2-ol, $CH_3CH{=}CHCH(OH)CH_3$, have?

.....

..... **[2]**

/2

Source: Learners' Alley, Introduction to Organic Chemistry slides

B Practice

20 MARKS

8 COMMON Which compound has the greatest number of stereoisomers?

A 2-methylhex-2-ene
B 3-methylhex-2-ene
C 4-methylhex-2-ene
D 5-methylhex-2-ene

Answer ☐ **[1]**

/1

Source: 2025 ASRJC J2 Prelim P1 Q20

9 Give the IUPAC names of the following compounds.

(a) $CH_2{=}CHCH(Cl)CH_2CH_3$

..... **[1]**

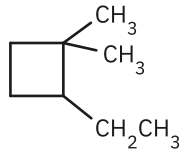
(b) $CH_3CH(OH)CH(OH)CH_2COCH_2CH_3$

..... **[1]**

(c) $CH_3CH_2CH(CH_3)CH(CH_2CH_3)CH_2CH(CH_3)CH_2CH_3$

..... **[1]**

(d)



.....

[1]

/4

Source: RJC H2 Chemistry Tutorial 10 (Introduction to Organic Chemistry), Q3

10 COMMON Classify each of the following reactions as addition, substitution, elimination, hydrolysis, reduction or oxidation.

(a) $CH_2{=}CH_2 + H_2 \rightarrow CH_3CH_3$ (Pt catalyst)

.....

[1]

(b) $CH_3COCH_3 + HCN \rightarrow CH_3C(OH)(CN)CH_3$

.....

[1]

(c) $CH_3CH_2CH_2Cl \rightarrow CH_2{=}CHCH_3 + HCl$ (alc. KOH, heat)

.....

[1]

(d) $CH_3CH_3 + Cl_2 \rightarrow CH_3CH_2Cl + HCl$ (uv light)

.....

[1]

(e) $CH_3CH_2OH \rightarrow CH_2{=}CH_2 + H_2O$ (conc. H_2SO_4)

.....

[1]

(f) $CH_3CONH_2 + H_2O \rightarrow CH_3COOH + NH_4^+$ (H^+)

.....

[1]

/6

Source: RJC H2 Chemistry Tutorial 10 (Introduction to Organic Chemistry), Q7(b) to (g)

11 What do you understand by the terms cis-trans isomerism and enantiomerism?

.....

.....

.....

.....

[2]

/2

Source: EJC 2022 JC1 Introduction to Organic Chemistry Tutorial, Q7(a)

12 State which type of stereoisomerism each compound shows, mark any chiral carbon with an asterisk, and draw the stereoisomers.

(a) hex-3-ene

[2]

(b) 2-bromobutane

[2]

/4

Source: RJC H2 Chemistry Tutorial 10 (Introduction to Organic Chemistry), Q6(a) and (b)

13 CHALLENGE The effect of plane polarised light on tartaric acid (2,3-dihydroxybutanedioic acid), $HO_2CCH(OH)CH(OH)CO_2H$, was investigated by Louis Pasteur. Pasteur identified three different types of tartaric acid molecule. Molecule A rotated plane polarised light to the right. Molecule B rotated plane polarised light to the left. Molecule C had no effect on plane polarised light. Suggest an explanation for these observations.

.....

.....

.....

.....

.....

.....

[3]

/3

Source: A Level 2012 P2 Q5(c), via EJC 2022 JC1 Introduction to Organic Chemistry Tutorial, Q10