Mark scheme

Introduction to organic chemistry

Chemistry 0620 · Questions from Paper 1, Paper 2, Paper 3 and Paper 4

Total marks

50

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
1	1	1	1	1	1	10	11	11	12	**50**

Question 1 [1]

Answer D

Question 2 [1]

Answer C

Question 3 [1]

Answer D

Question 4 [1]

Answer A

Question 5 [1]

Answer D

Question 6 [1]

Answer D

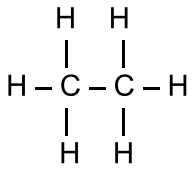
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Question 7 **[10]**

7 **(a)** 1 mark for each correct line / indication

alkane → C_2H_6
alkene → C_2H_4
alcohol → C_2H_5OH
carboxylic acid → CH_3COOH [4]

(b) Full structural formula shown i.e.



[1]

ALLOW: correct dot and cross diagram

(c) saturated has <u>only</u> single bonds / no double bonds; [1]

unsaturated has double bond(s) [1]
IGNORE: one has single bonds and the other has double bonds

(d) bromine water / aqueous bromine / bromine / **ALLOW**: correct formula; [1]
IGNORE: Br

(saturated hydrocarbon) no reaction / stays the same colour / remains orange / remains orange-brown [1]
ALLOW: remains brown
ALLOW: remains yellow (if aqueous bromine used) / remains red (if bromine used)
IGNORE: remains yellow (if bromine used)
REJECT: incorrect colour, e.g. stays same blue colour, does not score

(unsaturated hydrocarbon) decolourises / goes colourless [1]
IGNORE: goes clear
IGNORE: initial incorrect colour of bromine

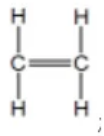
(acidified) potassium permanganate / potassium manganate(VII) (1 mark)
goes colourless / purple to colourless (1 mark)

IF: incorrect reagent 0 for this question

[Total: 10]

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Question 8 [11]

8(a)(i)	S and U; both have OH (group);	2 1 1
8(a)(ii)	Q and T;	1
8(b)	compounds; chemical; functional;	3 1 1 1
8(c)(i)		1
8(c)(ii)	aqueous bromine is added to (test tube of) ethene / aqueous bromine is orange; aqueous bromine turns colourless / solution turns colourless;	2 1 1
8(c)(iii)	high temperature / heat;	1
8(c)(iv)	$C_{13}H_{28}$;	1

Question 9 [11]

9(a)	**M1** (same) general formula (1) **M2** (contain the same) functional group (1)	2
9(b)	-CH_2- unit	1
9(c)(i)	**M1** alkenes (1) **M2** alkanes (1) **M3** carboxylic acids (1)	3
9(c)(ii)	**M1** propanoic acid (1) **M2** displayed formula of propanoic acid (1)	2
9(d)(i)	**M1** *working to give the mass of atoms shown in Fig 6.1* 103 – 14 – (2 × 12) – (2 × 16) – (4 × 1) (= 29) **M2** 'R' = C_2H_5	2
9(d)(ii)	proteins	1

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Question 10 [12]

10(a)	**M1** (have a) general formula of C_nH_{2n+2} **M2** differ from one member to the next by a $–CH_2–$ unit	**2**
10(b)(i)	increases	**1**
10(b)(ii)	**M1** physical property **M2** change as chain length increases	**2**
10(c)	all carbon–carbon bonds are single (bonds)	**1**
10(d)(i)	ultraviolet light	**1**
10(d)(ii)	**M1** $CH_3CH_2CH_2Cl$ **M3** 1-chloropropane **M2** $CH_3CHClCH_3$ **M4** 2-chloropropane	**4**
10(d)(iii)	(compounds with) the same molecular formula but different structural formulae or structure	**1**

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