Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

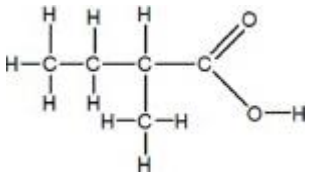
Mark Schemes

Q1.

(a) $C_4H_9COOH + NaHCO_3 \rightarrow C_4H_9COONa + CO_2 + H_2O$

1

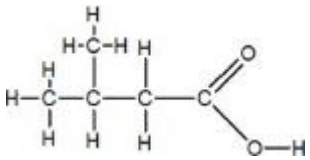
(b)



$CH_3CH_2CH(CH_3)COOH$

1

(c) **M1**



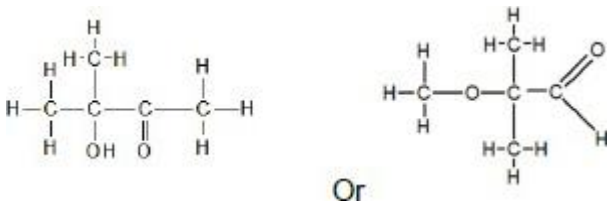
M1 $(CH_3)_2CHCH_2COOH$

M2 6:1:2:1 (Any order)

M2 Allow ECF for a 5 carbon carboxylic acid

2

(d) **M1**



Or

M2

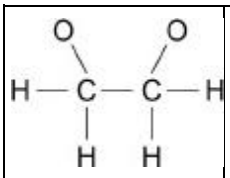
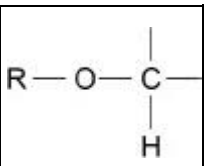
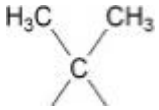
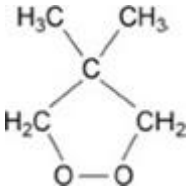
Adjacent C has no (non-equivalent) H attached (so no splitting/spin-spin coupling takes place)

M1 $(CH_3)_2C(OH)COCH_3$ or $CH_3OC(CH_3)_2CHO$

2

(e)

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	Scores M1 and M2	Allow M1 for	
	Scores M3 and M4	Allow M3 for	RCH_3
	Scores M5		This structure also scores M5 
^{13}C peaks	= 3	M6	Allow ECF from their M5 of $C_5H_{10}O_2$

6

[12]

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Q2.

(a) Reduces loss of liquid droplets

Allow description of reduction of loss of liquid

1

(b) M1 Tangent drawn at 2 mins

M2 Gradient of tangent = (0.50 +/- 0.05)

M3 g min^{-1}

Conseq to their M1

If convert mins to sec M2 = 7.80 x 10^{-3} (7.0 x 10^{-3} to 8.6 x 10^{-3}) and award M3 conseq

If M1 not awarded then allow average rate calculated M2 = 1.05

If M1 not awarded then allow average rate and if 120 sec used for time allow M2 =0.0175 and can score M3 for g s^{-1}

Penalise g/min

3

(c) M1 Curve steeper at first & flattens at same point on y axis

M2 Cl is an electron withdrawing group or negative inductive effect

M3 Weakens the O-H bond / increase polarity of O-H bond

Allow opposite argument

M2 CH_3 electron donating or positive inductive effect

M3 Makes O-H bond stronger / decrease polarity of O-H bond

Also allow answers that discuss the carboxylate ion

M2 Cl Electron withdrawing group

M3 makes $RCOO^-$ less negative / delocalises the negative charge more / more stable ion (so $RCOO^-$ less likely to accept H^+)

3

[7]

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