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

Mark Schemes

Q1.

(a) **M1** $CH_3CH_2CH_2COOH$
not C_3H_7COOH
1

M2 CH_3CH_2OH or C_2H_5OH
1

M3 $CH_3CH_2CH_2COOCH_2CH_3 + H_2O$
allow $C_3H_7COOC_2H_5$
penalise M3 for wrong products and unbalanced equation
1

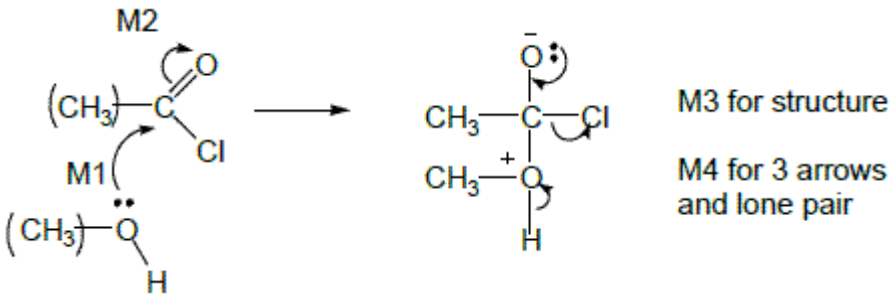
M4 H_2SO_4 or HCl or H_3PO_4 conc or dil or neither
not HNO_3
1

(b) **M1** $CH_3CH_2CH_2CH_2OH$
1
not C_4H_9OH

M2 $(CH_3CO)_2O$
1

M3 → $CH_3COOCH_2CH_2CH_2CH_3 + CH_3COOH$
allow $CH_3COOC_4H_9$
penalise M3 for wrong products and unbalanced equation
1

(c) (nucleophilic) addition-elimination



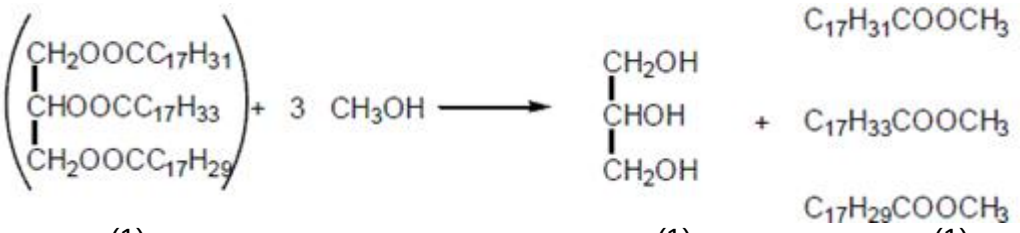
not acylation alone
M2 not allowed indep of M1 but allow M1 for correct attack on C+
+C=O loses M2
only allow M4 after correct or v close M3

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ignore Cl^- removing H^+

5

(d)



(1) (1) (1)

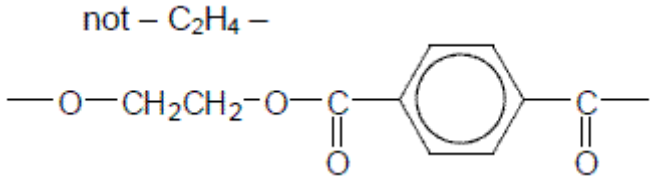
ignore errors in initial triester

First mark for $3CH_3OH$

Third mark for all three esters

3

(e)



First mark for correct ester link second mark for the rest including trailing bonds

If ester link wrong, lose second mark also

2

Adv reduces landfill
saves raw materials
lower cost for recycling than making from scratch
reduces CO_2 emissions by not being incinerated

not allow cost without qualification
ignore energy uses

1

Disad difficulty/cost of collecting/sorting/processing
product not suitable for original purpose, easily contaminated

not allow cost without qualification
ignore energy uses

1

[19]

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