

Name of the Student: _____

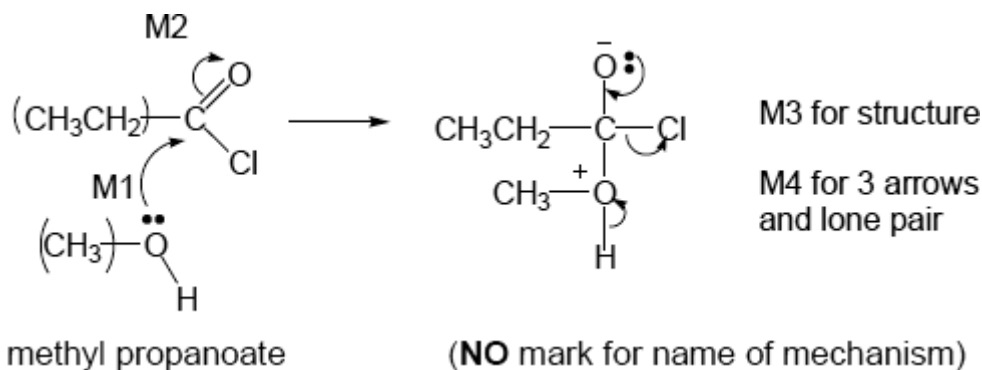
Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

(a)



- M2 not allowed independent of M1, but allow M1 for correct attack on C⁺
- + rather than δ^+ on C=O loses M2
- If Cl lost with C=O breaking, max1 for M1
- M3 for correct structure with charges but lp on O is part of M4
- only allow M4 after correct/very close M3
- ignore Cl⁻ removing H⁺

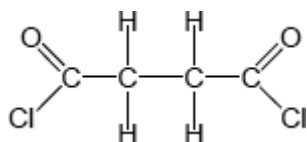
4

(b) (i) pentane-1,5-diol

Second 'e' and numbers needed

Allow 1,5-pentanediol but this is not IUPAC name

(ii)



Must show ALL bonds

1

(iii) All three marks are independent

M1 (base or alkaline) Hydrolysis (allow close spelling)

1

Allow (nucleophilic) addition-elimination or saponification

M2 δ^+ C in polyester

1

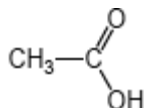
M3 reacts with OH⁻ or hydroxide ion

1

Not reacts with NaOH

1

(c) (i)



Allow CH₃COOH or CH₃CO₂H

1

(ii) (nucleophilic) addition-elimination

Both addition and elimination needed and in that order

OR

(nucleophilic) addition followed by elimination

*Do **not** allow electrophilic addition-elimination / esterification*

Ignore acylation

1

(iii) any **two** from: ethanoic anhydride is

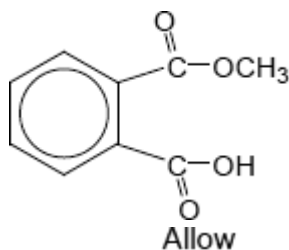
- less corrosive
- less vulnerable to hydrolysis
- less dangerous to use,
- less violent/exothermic/vigorous reaction OR more controllable rxn
- does not produce toxic/corrosive/harmful fumes (of HCl) OR does not produce HCl
- less volatile

NOT COST

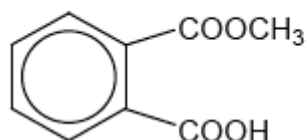
List principle beyond two answers

2

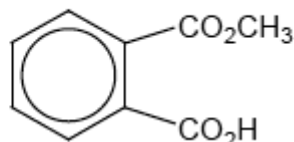
(d)



Allow



OR



1

(e) (i) ester

*Do **not** allow ether*

Ignore functional group/linkage/bond

1

(ii) 12 or twelve (peaks)

1

(iii) 160 – 185

Allow a number or range within these limits

Penalize extra ranges given

Ignore units

1

(f) (i)

sulfuric acid	sodium hydroxide	✓
hydrochloric acid	ammonia	X or blank
ethanoic acid	potassium hydroxide	✓
nitric acid	methylamine	X or blank

4 correct scores 2

3 correct scores 1

2 or 1 correct scores 0

2

(ii) Pink to colourless

Allow 'red' OR 'purple' OR 'magenta' instead of 'pink'

*Do **not** allow 'clear' instead of 'colourless'*

1

[21]