



Name _____ Class: _____

Start Time _____ End Time _____ Time Taken _____

Time allowed: 29 minutes

INSTRUCTIONS TO CANDIDATES

- This document is designed to be used as a practice test.
- Complete the test under exam conditions in one sitting.
- Optionally, before marking it, go through the paper with a set of notes and improve your answers.
- Mark the test using the mark scheme make corrections on the paper.
- Complete the table on the front page.
- Improve your notes so that they better reflect your weaknesses.
- Make a note of your strengths and weaknesses for future revision.

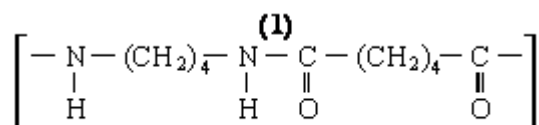
Success Criteria	Questions in Paper	Mark	Out of	%	Rank Order
Aliphatic Synthesis	1a		7		
Polymers	1b, 1c		7		
Acyl chlorides	2a		6		
Aromatic Synthesis	2b, 2c		9		
Total			29		



Q1.

- (a) 1, 4-diaminobutane or butane -1, 4-diamine (1)
 A: BrCH₂CH₂Br or ClCH₂CH₂Cl (1)
 B: NC CH₂CH₂CN
 Step 1: Br₂ or Cl₂ (1) (ignore aq)
 Step 2: KCN (1) (NOT HCN)
 Step 3: H₂ / Ni or LiAlH₄ or Na / C₂H₅OH (1) (NOT NaBH₄)
 Hydrogenation only for H₂ / Ni, or nucleophilic addition only for LiAlH₄(1)
 OR reduction or addition

7



- (b) (1)

QL hydrogen bonding (1)

Polarity of H-bonding shown or discussed (1)

4

- (c) Polyamides / peptide link can be hydrolysed (1)
 OR polyalkenes cannot be hydrolysed

QL OH⁻ attacks peptide link or C^{δ+} (1)
 poly(ethene) non-polar (1)

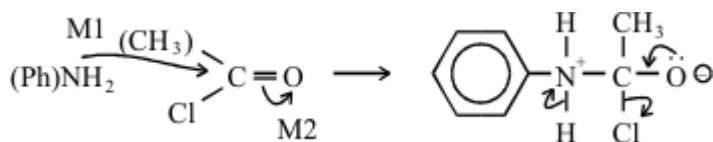
3

[14]

Q2.

- (a) CH₃COCl or (CH₃CO)₂O (1)
 AlCl₃ or H₂O or CH₂SO₄ loses this mark
 CH₃COOH loses reagent and M3, M4 = max 3

nucleophilic addition-elimination (1)



M3: structure

M4: 3 correct arrows

Allow M1 for attack on CH₃-C⁺=O

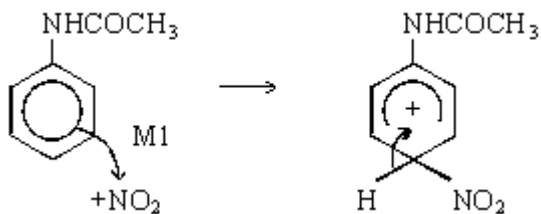
Penalise Cl⁻ removing H⁺

6



- (b) Conc HNO₃ (1)
 Conc H₂SO₄ (1)
 $\text{HNO}_3 + 2 \text{H}_2\text{SO}_4 \rightarrow \text{NO}_2^+ + \text{H}_3\text{O}^+ + 2 \text{HSO}_4^-$ (2)
 (or H₂SO₄) (or H₂O + HSO₄⁻)
 HNO₃ / H₂SO₄ scores 1
 Any 2

electrophilic substitution (1)

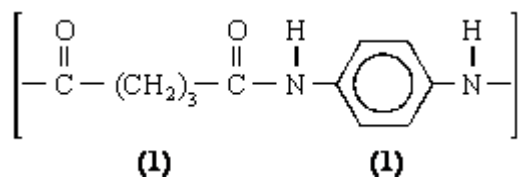


M2 structure

M3 arrow

6

- (c) Sn (or Fe) / HCl or Ni / H₂ (1)
 NOT LiAlH₄ NaBH₄



3

[15]