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CHEMISTRY

ORGANIC CHEMISTRY II

Level & Board	AQA (A-LEVEL)
TOPIC:	AROMATIC CHEMISTRY
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	10
TOTAL MARKS	32

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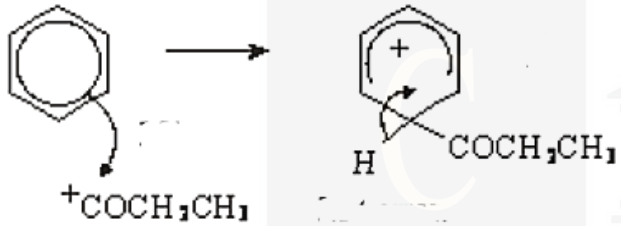
Aromatic Chemistry – 1

1.

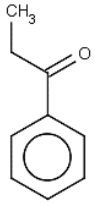
Role of aluminium chloride as a catalyst:

$CH_3CH_2COCl + AlCl_3 \rightarrow [CH_3CH_2CO]^+ + AlCl_4^-$

Mechanism:



Product:



$AlCl_4^- + H^+ \rightarrow AlCl_3 + HCl$

(5)

2. C

(1)

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3.

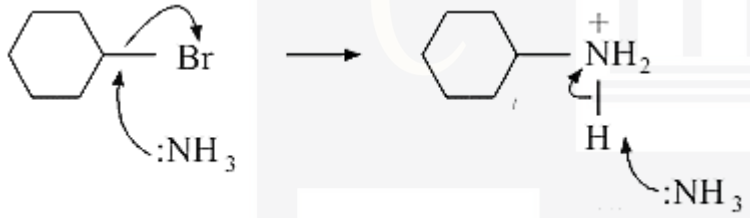
Equation:

$C_6H_{11}Br + 2NH_3 \rightarrow C_6H_{11}NH_2 + NH_4Br$

Name of mechanism:

Nucleophilic substitution

Mechanism:



(6)

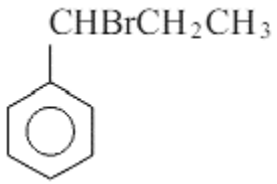
4. **B**

(1)

5.

(a)

Isomer 1:



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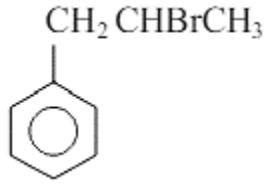
Isomer 2:



(2)

(b)

Name of mechanism:

Electrophilic addition

(1)

(c)

Carbonium ion 1

$C_6H_5C^+HCH_2CH_3$

Carbonium ion 2

$C_6H_5CH_2C^+HCH_3$

Both are secondary but one is more stable that is why the two isomers are obtained in unequal amounts.

(2)

6. B

(1)

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7.

Phenylamine ($C_6H_5NH_2$) is a weaker base than cyclohexylamine ($C_6H_{11}NH_2$) because the lone pair on nitrogen is less available for donation.

This reduced availability is due to delocalization within the phenyl ring, which withdraws electron density from the amino group, making it less likely to accept a proton.

(3)

8. A

(1)

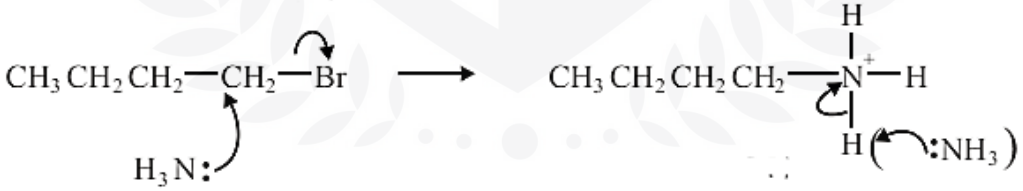
9.

(a)

Name of the mechanism:

Nucleophilic substitution

Mechanism:



Product:

$CH_3CH_2CH_2CH_2NH_2$

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(5)

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(b)

Following are the equations for each of the two steps in the synthesis:

Step 1:

$CH_3CH_2CH2Br + KCN \rightarrow CH_3CH_2CH_2CN + KBr$

Step 2:

$CH_3CH_2CH_2CN + 2H_2 \rightarrow CH_3CH_2CH_2CH_2NH_2$

(3)

10. B

(1)

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