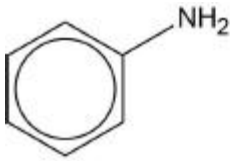
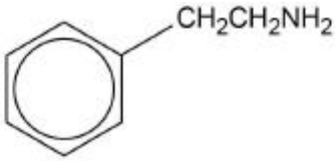
Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

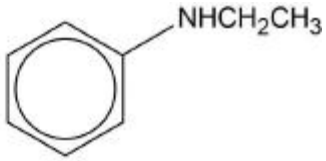
This question is about the three amines, **E**, **F** and **G**.



E



F



G

(a) Amines **E**, **F** and **G** are weak bases.

Explain the difference in base strength of the three amines and give the order of increasing base strength.

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_____

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_____

(6)

(b) Amine **F** can be prepared in a three-step synthesis starting from methylbenzene.

Suggest the structures of the two intermediate compounds.

For each step, give reagents and conditions only. Equations and mechanisms are **not** required.

_____

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_____

(5)

(Total 11 marks)

Q2.

Halogenoalkanes such as 1,1,2-trichloro-1,2,2-trifluoroethane were used as coolants in refrigerators until the late 1980s. Their use was then banned and alternative coolants were used instead.

(a) Draw the displayed formula of 1,1,2-trichloro-1,2,2-trifluoroethane.

(1)

(b) 1,1,2-Trichloro-1,2,2-trifluoroethane was banned for use as a refrigerant because it damaged the ozone layer.

Write **three** equations to show how this compound is involved in damaging the ozone layer.

_____

_____

_____

(3)

(c) State the role of chlorine atoms in the reactions in part **(b)**.

_____

(1)

(d) Inevitably, some coolant escapes from refrigerators.

Deduce which of the following coolants, **A**, **B** or **C**, would cause least environmental damage to the atmosphere.

$CHCl_2CHClF$	CF_3CH_2F	CF_3CCl_2F
A	**B**	**C**

Coolant _____

(1)

(e) Give the IUPAC name of compound **B** in part **(d)**.

_____

(1)

(f) The boiling point of iodomethane (CH_3I) is higher than that of fluoromethane (CH_3F) even though the electronegativity of iodine is less than that of fluorine.

Explain why iodomethane has the higher boiling point by considering the forces that act between CH_3I molecules and comparing these forces with the forces between the CH_3F molecules.

_____

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_____

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_____

(3)

(Total 10 marks)