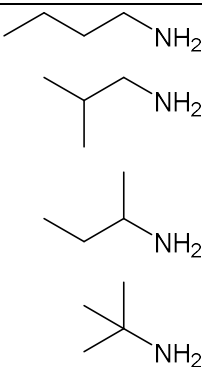
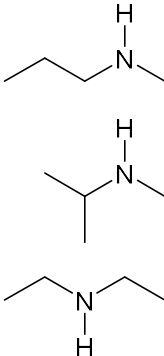
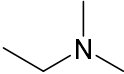
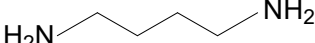
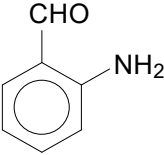
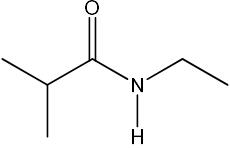
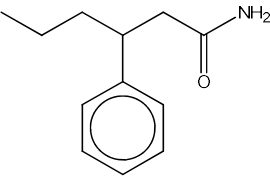
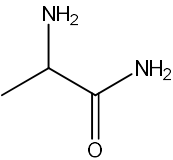


Suggested Answers to Self-check Questions

Q1

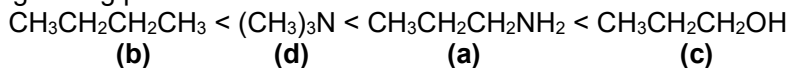
1° amines	2° amines	3° amines
		

Q2

(a) 	(b) 	(c) 
(d) 	(e) 	

Q3

Order of increasing boiling point:



The 4 compounds similar electron cloud size.

Boiling each compound involves overcoming the intermolecular forces within each compound. The stronger the intermolecular forces are, the greater is the energy needed to overcome these forces and the higher is the boiling point of the compound.

(b) has the lowest boiling point as only weak instantaneous dipole-induced dipole interactions exist between these non-polar molecules.

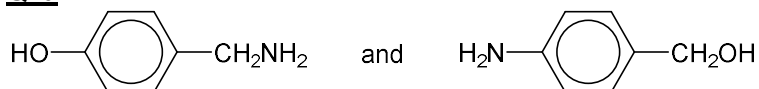
(d) has a higher boiling point than **(b)** because the molecules in **(d)** are polar and the permanent dipole-permanent dipole forces that exist between them are stronger than the instantaneous dipole-induced dipole forces between the molecules in **(b)**.

(a) has a higher boiling point than **(d)** because the hydrogen bonds that exist between the molecules of **(a)** are stronger than the permanent dipole-permanent dipole forces that exist between the molecules of **(d)**.

(c) has the highest boiling point because the hydrogen bonds between molecules of **(c)** are stronger than that between molecules of **(a)** as the O–H bond is more polar due to the greater electronegativity

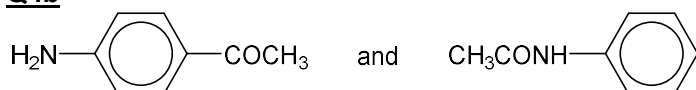
difference between O and H than between N and H. Thus the largest amount of energy is needed to overcome the intermolecular forces in **(c)** than in the other compounds.

Q4a



Test	Add neutral $\text{FeCl}_3(\text{aq})$ to each sample in a test tube.	
Observations	For <chem>Oc1ccc(cc1)CN</chem> a violet colouration would be observed. For <chem>Nc1ccc(cc1)CO</chem> there would be no violet colouration.	Note: Br_2 cannot be used as both phenol and phenylamine will react to result in decolourisation.

Q4b



Test	Add 2,4-dinitrophenylhydrazine to each sample in a test tube.	Add $\text{I}_2(\text{aq})$ and $\text{NaOH}(\text{aq})$ to each sample in a test tube and heat each mixture in a hot water bath.
Observations	For <chem>Nc1ccc(cc1)C(=O)C</chem> an orange precipitate would be observed. For <chem>CC(=O)Nc1ccccc1</chem> there would be no orange precipitate.	For <chem>Nc1ccc(cc1)C(=O)C</chem> a yellow precipitate of CHI_3 would be observed. For <chem>CC(=O)Nc1ccccc1</chem> there would be no yellow precipitate.

Note: Br_2 cannot be used as both compounds will react to result in decolourisation.