Question 2(a)

Candidate 1

As when there is an ⊕ oneven distrubution of electrons a temprorary dipole forms where one atom gains a partial positive charge (lower electronegativity one) and the other gains a partial negative charge (higher electronegativity one)

Candidate 2

London dispersion forces are temporary dipoles which arrise when the electrons around an atom become unevenly distributed ← This has a knock on effect on neighbouring atoms, resulting in dipole-dipole interactions.

as the positive side of one atom becomes attracted to the negative side of another,

Meaning one side is fleetingly positive and the other fleetingly negative.

Candidate 3

LDF is formed between all molecules, formed when there is a small e-neg difference.

Candidate 4

London dispersion forces are caused by the uneven distribution of electrons in an element, this is called a temporary dipole. One end of the dipole is slightly negative (δ^-) and one end is slightly positive (δ^+). This dipole can induce a temporary dipole on another atom and the slightly negative end of one atom and slightly postive end of another are attracted to each other.

Candidate 5

LDFs are formed when induced dipoles and temporary dipoles attract eachother

Question 2(b)

Candidate 1

As they are both covalent molecules but one (~~methane~~ CH_4) contains only LDF while H_2O contains both LDF and ~~high~~ hydrogen bonds so their boiling points can be compared

Candidate 2

~~H_2O contains hydrogen bonds~~

They are both covalent molecules and so the structure is not going to ~~impact the reason~~ differ.

Candidate 3

because CH_4 has LDF which is the weakest and H_2O has LDF + hydrogen, hydrogen is the strongest this is shown in the bp's

Candidate 4

They have the same number of electrons and different types of intermolecular bonding.

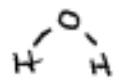
Candidate 5

CH_4 contains only London dispersion forces and H_2O contains both hydrogen bonds and LDFs.

Question 2(c)

Candidate 1

As it is an asymmetrical molecule due to the number of atoms present, it is also contains a difference of electronegativity of 1.2 which is within the range for a polar molecule.



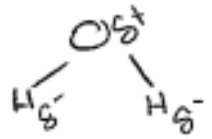
Candidate 2

Water is a polar molecule as it contains polar bonds (the hydrogen bonds between O-H). As the molecule is not symettrical, the polarities do not cancel out.

Candidate 3

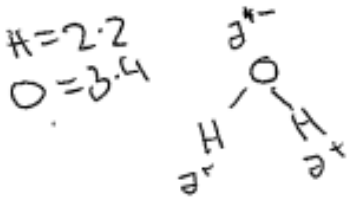
Water is polar because a large e-neg difference, the atom has a δ^- charge on the oxygen + slightly δ^+ charge on hydrogen, Water also contains Hydrogen bonding which usually indicate it its (O-H) polarity.

Candidate 4



water is a polar molecule due to its angular shape, it has both a slightly positive and slightly negative end which are not cancelled out.

Candidate 5



water is polar due to the difference in electronegativities. The oxygen is more negative and the Hydrogens are more positive.

Question 4(b)

Candidate 1

They provide an alternative reaction pathway which has a lower activation energy so the nomber of succeseul collisions increases as less energy is required for them to occur.

Candidate 2

Catalysts lower the activation energy ~~(the energy required by col collis~~ (the minimum energy required for a reaction to occur) making it easier for the activated complex to form and so particles dont need as much energy to be able to collide succesfully.

Candidate 3

Catalysts can increase activation energy, this means that particles can move about faste leading to more succeful collision)

Candidate 4

Catalysts attach themselves to the reactants, increasing the surface area of the reactants, therefor increasing the number of successful collisions.

Candidate 5

catalysts provide an alternative pathway and lower the activation energy required for the reaction

Question 6(c)(ii)

Candidate 1

This is where the enzyme is put past its optimum pH or temperature, meaning the active site changes shape as the hydrogen bonds are broken which will prevent the bananas turning brown.

Candidate 2

When bonds are broken within the proteins that form an enzyme due to high temperatures, meaning the enzyme changes shape and cant perform its function.

Candidate 3

hydrogen bonds being broken, due to heat- molecule

When extreme heat is applied hydrogen bonds break causing enzymes shape to distort can not longer fit into active site so denatured

[Turn over

Candidate 4

Denaturing is the process in which the hydrogen ^ double bonds are broken causing the carbon chain to change shape and unwind.

Candidate 5

when proteins / enzymes change shape and loose function.

Question 7(a)(iii)(B)

Candidate 1

as there is a lower pressure on the right side of the reaction so the equilibrium shifts to the right to try and balance out the pressure which causes more succesful collisions and therefore a higher yield of ethanol.

Candidate 2

increasing pressure favours the side with the least gaseous moles. As the lefthand side of the reaction has 2 gaseous moles and the right has 1, equilibrium would favour the forward reaction and shift to the right as the right side has the least gaseous moles.

Candidate 3

an increase in pressure shifts to the side with least moles to undo it so it would move right as there only 1 mole compared to the two on other side, causo the reaction to replace

Candidate 4

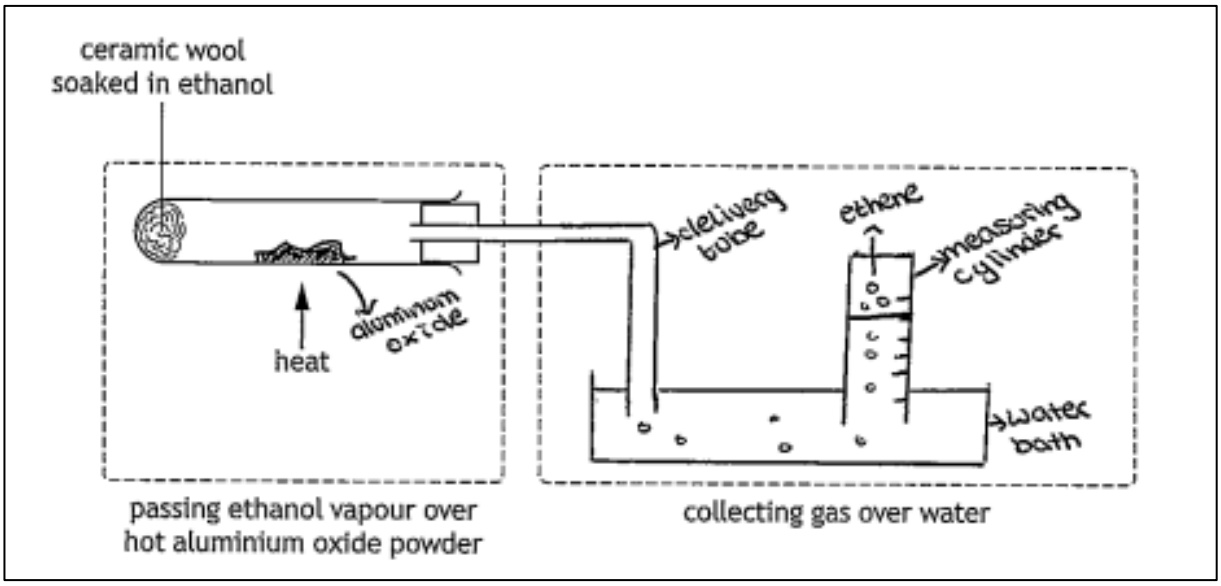
An increase in pressure would favour the side of the reaction with less moles of gas, meaning it would favour the products as the equilibrium would shift to the right to produce more moles of ethanol.

Candidate 5

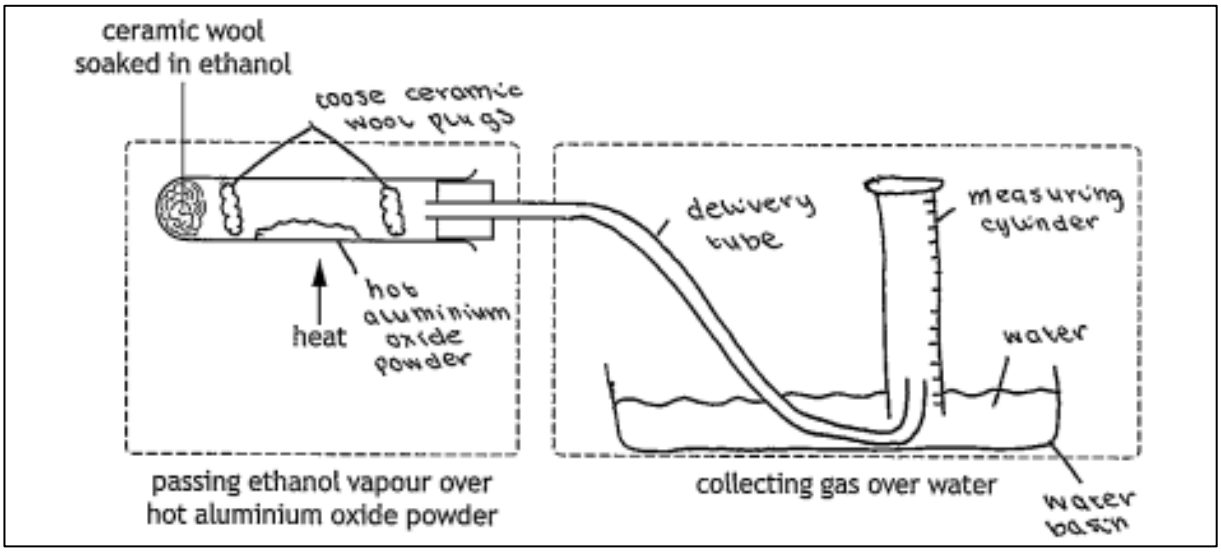
the right favours higher pressure

Question 7(c)(i)

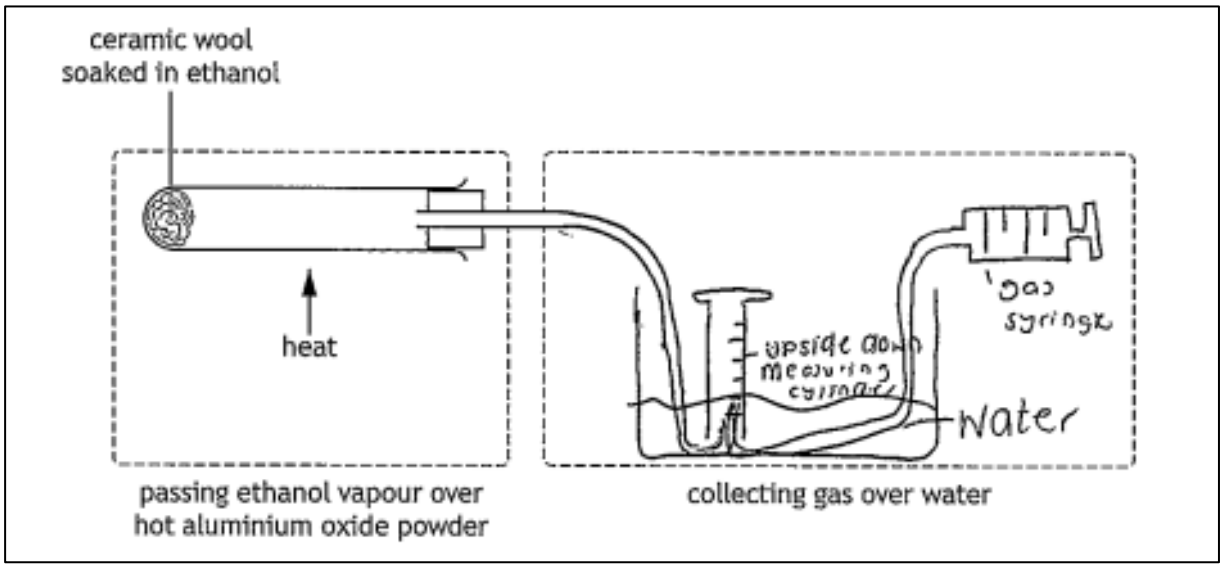
Candidate 1



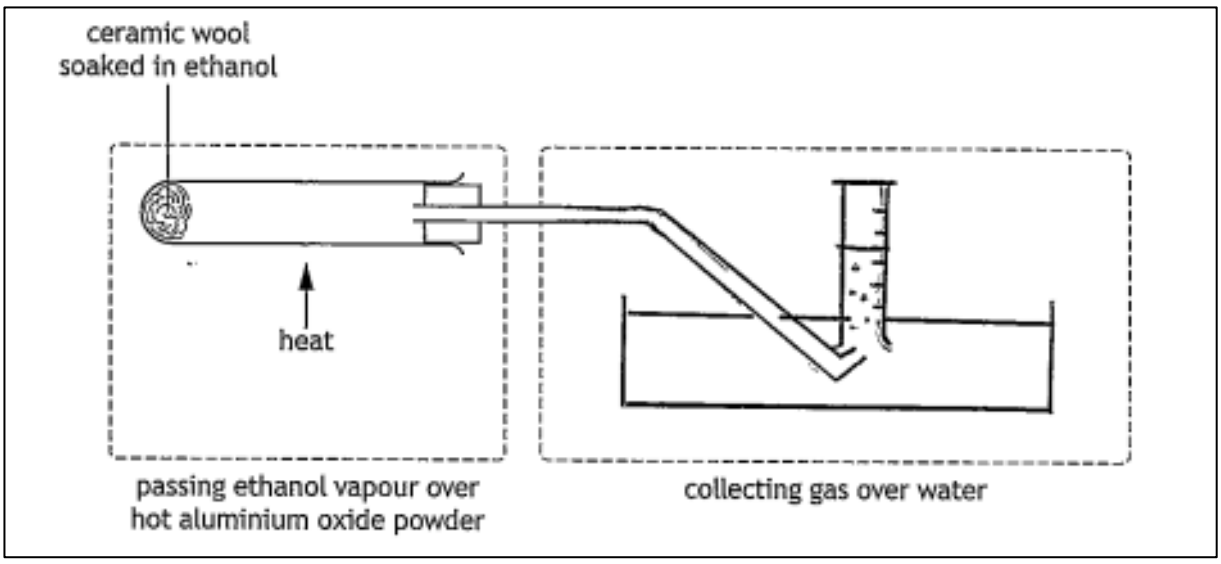
Candidate 2



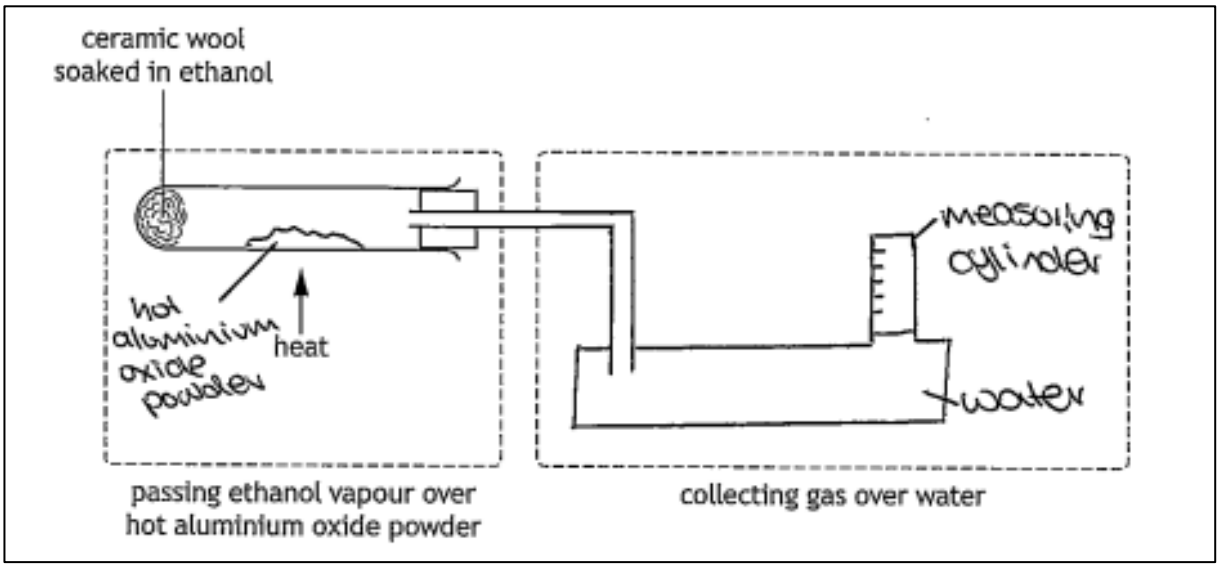
Candidate 3



Candidate 4



Candidate 5


ceramic wool
soaked in ethanol
hot
aluminium
oxide
powder
heat
measuring
cylinder
water
passing ethanol vapour over
hot aluminium oxide powder
collecting gas over water

Question 8(c)

Candidate 1

as these are very strong bonds so they will need an extreme amount of heat to break - solfor molecules contains 4 molecules so there is a lot of bonds to break.

[Turn over

Candidate 2

~~Sulfur is a covalent network structure meaning these disulfide bonds are covalent bonds which are extremely strong - for stronger than~~ Sulfur is a covalent molecular solid and so has a for higher melting and boiling point than other covalent molecules.

[Turn over

Candidate 3

because there is disulfide bond) are extremely hard to break (very strong covalent bonds)

Candidate 4

Sulfur has a high melting and boiling point

Candidate 5

there are more bonds to break

Question 11(b)(ii)

Candidate 1

open the burette again until the tap end is full and there is no air bubbles, then wait until the volume reaches the 0.0 cm^3 mark

Candidate 2

titration.

the solution should be ~~released~~ drained until it reaches the 0.0 cm^3 mark (through the tap at the bottom of the burrette)

Candidate 3

rinse with acid

Candidate 4

- drain out excess solution dropwise to 0.0 cm^3 on the scale, into a spare beaker.

Candidate 5

let the solution run past the 0.0cm³ line.