Mark schemes

Q1.

(a) high temperatures

ignore pressure

1

(cause) nitrogen (from air) and oxygen (from air) to react

1

(b) less climate change

ignore references to water vapour
allow less global warming
allow an effect of climate change for climate change

1

(because) no carbon dioxide (produced)

1

(c) more oxides of nitrogen (produced)

1

(so) more acid rain
or
(so) more respiratory problems

allow an effect of acid rain for acid rain
allow a named respiratory problem for respiratory problems
MP2 cannot be linked to an incorrect gas from MP1 1

1

(d) (volume of oxygen = $3.50 \times \frac{1}{2} =$
1.75 (dm³)

1

(volume of air =) $1.75 \times \frac{100}{20}$

allow correct use of an incorrectly determined volume of oxygen

1

= 8.75 (dm³)

1

(e) there is a temperature gradient in the (fractionating) column

allow the (fractionating) column gets cooler going up

1

(so) kerosene condenses

allow (so) the hydrocarbons / vapours condense

1

at the level (in the column) corresponding to kerosene's boiling point (range)

allow at the level (in the column) corresponding to the boiling point of the hydrocarbons / vapours
for the award of 2 marks for MP2 and MP3, a reference to kerosene must be made

1

[12]

Q2.

(a)   water vapour

1

(b)   (increased population so) more energy required

> *allow (increased population so) more transport required*

1

(so) more (fossil) fuels burned

> *allow a named fossil fuel*

OR

(increased population so) more farmland required (1)

(so) more deforestation (1)

1

(c)   (increased population so) more food required

1

(so) more methane-producing food production

> *allow more use of beef cattle (in food production)*
> *allow more rice grown*

OR

(increased population so) more waste produced (1)

(which) produces more methane on decomposition (1)

1

(d)   any **two** from:
- melting ice
- rising sea levels
- flooding
- extremes of weather
- loss of habitats

> *ignore global warming*
>
> *do **not** accept acid rain*
> *do **not** accept global dimming*
> *do **not** accept references to ozone*

2

(e)   there may be other reasons for changes in the (mean)

> *allow difficult to model*

temperature (of the atmosphere at the Earth's surface)

> *allow the earth goes through cycles of temperature change*

1

[8]