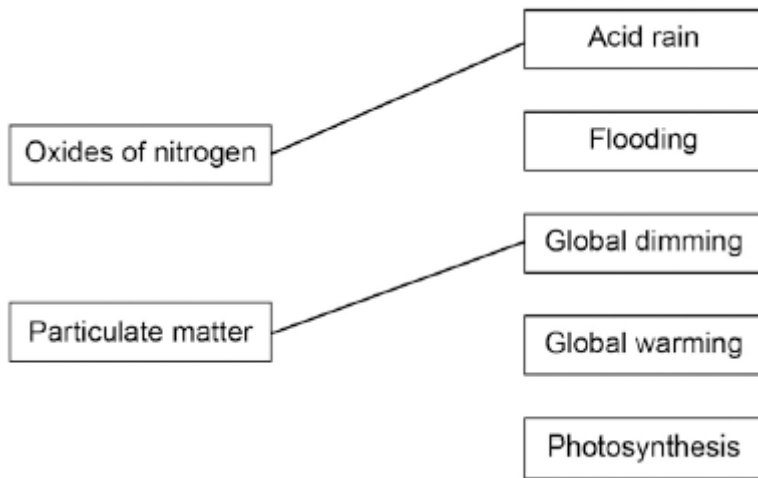


M1.(a)	C_5H_{12}	1
(b)	Alkanes	1
(c)	(3) CO_2	1
	(4) H_2O	1
	<i>allow for 1 mark</i> $4 CO_2 + 3 H_2O$	
(d)	contains hydrogen and carbon	1
	(hydrogen and carbon) <u>only</u>	1
(e)	<i>(diesel)</i> produces more oxides of nitrogen <i>allow converse answers in terms of petrol</i>	1
	produces (more) particulate matter	1
	produces less carbon dioxide	1

(f)



2
[11]

M2.(a)	(i)	mixture (of different substances)	1
	(ii)	boiling (points)	1
	(iii)	distillation	1
(b)	(i)	combustion	1
	(ii)	(reactant)	
		oxygen	
		<i>allow correct formulae</i>	1
		(products)	
		<i>products in any order</i>	
		carbon dioxide	
		<i>allow carbon or carbon monoxide</i>	
		and	
		water	
		<i>allow water vapour or steam or hydrogen oxide</i>	1
	(iii)	(burning sulfur) produces sulfur dioxide / SO ₂	
		<i>allow it / sulfur reacts with oxygen ignore sulfur oxide</i>	1
		causes acid rain	1
(c)	(i)	propane is a fuel	1
	(ii)	double bond drawn between carbon atoms	
		<i>do not allow any other bonds or symbols</i>	1
	(iii)	orange to colourless	1
	(iv)	poly(pentene)	

allow polymer(s)

1

[12]

M3. (a) (i) bar drawn between 84 and 86 1

(ii) sulfur dioxide linked to acid rain 1

carbon particles linked to global dimming 1

(b) (i) any **one** from:

- plants / trees absorb (carbon dioxide)
- coal 'locks up' (carbon dioxide)

1

(ii) it increases the amount (of CO₂) 1

because carbon in coal (forms carbon dioxide)
accept because carbon / coal burns / reacts with oxygen (to produce CO₂)
1

[6]

- M4. (a) (i) increase 1
- (ii) energy is given out to the surroundings 1
- (b) (i) NO 1
allow 2NO
ignore nitrogen oxide
*do **not** allow equations*
- (ii) harmful / poisonous (owtte) 1
allow dangerous
ignore reference to pollution / global warming
*do **not** accept references to ozone layer*
- (c) a catalyst can speed up a chemical reaction 1
- different reactions need different catalysts 1
- (d) (i) smaller 1
accept less / tiny / very small
allow 10⁹
*do **not** allow small unless qualified*
- (ii) reduce cost (owtte) **or**

ignore references to energy

save resources / raw materials (owtte)

1

[8]

- M5.** (a) sulfur dioxide / SO₂
allow sulfur oxide 1
- (b) global dimming 1
- (c) oxygen / O₂ 1
- (d) (oil is a) limited resource / finite / non-renewable
accept running out of oil or wood is sustainable
accept (burning oil) increases amount of carbon dioxide in the atmosphere / global warming or releases locked up carbon / global dimming / acid rain
accept the oil (may become) too expensive 1
- (e) carbon dioxide produced (from burning wood)
ignore global warming 1
- carbon dioxide used by plants / trees or for photosynthesis
if no other mark awarded
allow carbon emissions used by plants / trees or for photosynthesis for 1 mark 1

[6]

- M6.** (a) acid rain → sulfur dioxide 1
- global warming → carbon dioxide 1
- global dimming → carbon particles 1
- (b) (i) oxygen 1
- (ii) carbon monoxide 1
- (c) (i) decreasing 1
accept running out / none left
- (ii) any **two** from:
it = coal
- world needs (more) energy
accept population is increasing
allow (greater) demand for coal / fuels / energy
 - plentiful supply
accept readily available
allow coal will 'last longer'
 - (many) countries have coal
 - easy to find / extract
 - oil / gas is running out

accept need to use less oil / gas

accept need to use it to replace oil / gas

- cheap **or** cheaper than oil

2

[8]

- M7.** (a) good (electrical) conductor
allow low reactivity / resistance to corrosion
*do **not** accept heat conductor* 1
- (b) a mixture of metals
accept contains more than one type of metal 1
- (c) (i) any **one** from:
- eyesore
 - destruction of habitats
 - pollution of water
 - dust pollution
 - noise
 - traffic pollution
- 1
- (ii) acid rain
allow sulfur dioxide is a pollutant 1

(d) (i) running out of copper (ores)

1

(ii) any **two** from:

- any specific example of using less copper
- reuse / recycle
*allow do **not** throw copper / brass away*
- use low-grade copper ores
- use other metals / materials in place of copper

2

[7]