THE ATMOSPHERE 1

MARK SCHEME

Q1.

Question	Answer	Extra information	Marks
(a)	(thought to cause) global warming / green house (effect) / climate change	ignore other consequences of global warming do not accept acid rain / ozone layer / global dimming	1
(b)	any three from: • replant trees / renewable / sustainable • carbon (dioxide) used by trees / photosynthesis • it is a (continuous / carbon) cycle or carbon (dioxide) goes back into the air • no new carbon (dioxide) is Produced or no locked up carbon (dioxide) is released or the carbon (dioxide) was absorbed millions of years ago	 ignore reusable accept trees absorb carbon (dioxide) as they grow ignore respiration accept burning wood is carbon neutral for the second and third bullet points: accept trees use carbon dioxide which is released when (trees / wood are / is) burnt for 2 marks	3
Total marks			4

Q2.

Question	Answer	Extra information	Marks
	sulfur dioxide (forms) acid rain	allow sulfur oxide accept acidic lakes / seas ignore consequences do not accept global warming / global dimming / ozone layer	1 1
Total marks			2

Q3.

Question	Answer	Extra information	Marks
(a)	any two from: • used by plants • used for photosynthesis • absorbed / dissolved in oceans • locked up in fossil fuels / limestone / sedimentary rocks	 allow specific plants and algae ignore oxygen released / respiration ignore oceans formed	2
(b)	increasing (CO_2 or global warming) more rapid increase recently carbon dioxide causes global warming	 accept greenhouse gas or climate change / sea level rising or ice caps melting do not accept ozone layer or acid rain or global dimming	1 1 1
Total marks			5

Q4.

Question	Answer	Extra information	Marks
(i)	 burning biodiesel releases CO_2 CO_2 is absorbed / used by the crops/plants (used to produce the biodiesel)	use of carbon throughout = max **1** ignore burning trees allow CO_2 absorbed / used by trees	 1 1
(b)	 increases CO_2 / greenhouse effect OR less CO_2 is absorbed (from atmosphere) because burning trees releases CO_2 OR	allow use of carbon for carbon dioxide throughout accept causes global warming allow causes climate change ignore other correct effects accept fewer trees to absorb CO_2 or crops / plants do not absorb as much CO_2 as trees ignore habitats / biodiversity if no other mark awarded	 1 1

	because there is less photosynthesis	global dimming because of smoke / particles gains 1 mark	
Total marks			4

Q5.

Question	Answer	Extra information	Marks
	carbon dioxide / CO_2 (causes) global warming / climate change / greenhouse gas or (cement) particles / smoke (1) (causes) asthma / dust / (global) dimming (1) or sulfur dioxide / SO_2 / nitrogen oxides / NOx (1) (causes) acid rain (1)	for a correct emission explanation must be correct for named emission ignore ozone layer accept breathing problems do not accept nitrogen or water vapour for emissions do not accept no named emission	1 1
Total marks			2

Q6.

Question	Answer	Extra information	Marks
(a)	any **two** from: **carbon dioxide has decreased due to:** • plants / microorganisms / bacteria / vegetation / trees • photosynthesis • 'locked up' in (sedimentary) rocks / carbonates / fossil fuels • dissolved in oceans **oxygen has increased due to:** • plants / bacteria /	asks for cause therefore no marks for just describing the change must link reason to a correct change in a gas accept idea of 'used' to indicate a decrease ignore respiration ignore volcanoes accept idea of 'given out / produced' ignore respiration accept idea of 'given out / produced'	2

	• microorganisms / vegetation / trees • photosynthesis **nitrogen increased due to:** • ammonia reacted with oxygen • bacteria / micro organisms	ignore (increase in) use of fossil fuels / deforestation	
(b)	(because methane's) boiling point is greater than the average / surface temperature or Titan's (average / surface) temperature is below methane's boiling point any methane that evaporates will condense	ignore references to nitrogen or water accept boils for evaporates accept cooling and produce rain for condensing	1 1
Total marks			4

Q7.

Question	Answer	Extra information	Marks
	any **four** from: • less (hydrocarbon) fuels used • less / no electrical energy used • reduce carbon / carbon dioxide emissions • reduce / no pollution by sulfur dioxide / acid rain • continuous process • conserve copper which is running out or only low-grade ores available • reduce the amount of solid waste rock that needs to be disposed • reduce the need to dig large holes (to extract copper ores)	ignore costs / sustainability / non-renewable allow less energy allow no electrolysis allow less global warming allow less / no transportation allow less waste allow less mining	4
Total marks			4

Q8.

Question	Answer	Extra information	Marks
(a)	oxygen and nitrogen 20-21% and 78-80%	 accept any two correct responses in the correct space for one mark	1 1
(b)	any **two** from: • it's a 'greenhouse gas' or increase greenhouse effect • causes global warming or increase in the Earth's temperature • sea-levels rise or flooding • climate change • (polar) ice-caps melt • extension of deserts	accept action of a 'greenhouse gas' mention of ozone / acid rain / global dimming = max 1 mark	2
Total marks			4

Q9.

Question	Answer	Extra information	Marks
(a)(i)	acid rain	accept consequences of acid rain allow asthma / bronchitis ignore toxic gas	1
(ii)	global dimming	accept dimming alone	1
(b)(i)	**sustainable:** maximum **two** from: • crops (that produce oil) can be grown in most places owtte • renewable • use less fossil fuels / diesel • use (refined) waste oils **low pollution:** maximum **two** from: • most emissions are lower or any two named emissions from CO / SO_2 / PM10 are lower • much / lot less SO_2 emissions (than the others) owtte • accept spillages / waste is biodegradable • less new CO_2 or (more) carbon neutral	 ignore references to CO_2 here	3

(ii)	plants / photosynthesis use carbon (dioxide) from the air it / biodiesel releases carbon (dioxide) from plants / crops / photosynthesis (fossil) diesel releases 'locked up' / new carbon (dioxide) / doesn't absorb CO_2 / absorbed it millions of years ago	allow 1 mark for biodiesel is (more) carbon neutral	1 1 1
Total marks			8

Q10.

Question	Answer	Extra information	Marks
	any **four** from: milk bag points • uses (75%) less crude oil to make (than a plastic milk bottle) • uses less energy / fuel to make (than a plastic / glass milk bottle) • produces less carbon dioxide to manufacture (than a plastic / glass milk bottle) • produces less waste (than a plastic / glass milk bottle) • less fuel used for transport than glass milk bottles • (produces waste because) milk bags are only used once whereas glass bottles can be	answer yes or no does not gain credit ignore references to volume of milk held / number of bottles used / biodegradability / habitats / pollution / mining / dust each marking point must be a comparison allow eg uses 75% less poly(ethene) which is made from crude oil allow produces less greenhouse gases / causes less global warming allow produces less CO_2 on burning allow takes up less landfill (space) allow an argued case for more waste eg milk bags are discarded / cannot be reused allow milk bags are discarded but glass bottles can be reused (24 / many times) allow glass bottles can be reused but milk bags can't	4

	re-used poly(ethene) points • uses a limited raw material / crude oil whereas the raw materials for glass are almost unlimited • less (5%) poly(ethene) is recycled (compared to glass (35%))	allow (35%) glass is recycled or (5%) poly(ethene) (bottles) recycled BUT milk bags aren't / are discarded **or** recycled poly(ethene) is not used to make new bags whereas recycled glass is used to make new bottles	
Total marks			4