

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	tides biofuels		1 1	AO1 6.1.3
01.2	a resource that will not run out in the near future		1	AO1 6.1.3
01.3	correct resource e.g., biofuel/wood		1	AO1 6.1.3
02.1	the data are not continuous/the names are categoric		1	AO2
02.2	number of renewables has increased from one in 1990 to three in 2017		1 1	AO2 4.1.3
02.3	total fossil fuels in 1990 = $230 + 20 + 0 = 250$ total fossil fuels in 2017 = $20 + 10 + 140 = 170$ change = $(250 - 170 =) 80$		1 1 1	AO2 4.1.3
02.4	coal plausible reason: coal more expensive/less available/too polluting		1 1	AO2 AO3 4.1.3
03.1	hydroelectric power — falling water drives a turbine, which drives a generator wind power — moving air drives a turbine, which drives a generator tidal power — moving water twice a day drives a turbine, which drives a generator solar power — light from the sun produces a potential difference directly	three marks for all four lines correct two marks for three lines correct one mark for one or two line(s) correct	3	AO1 6.1.3
03.2	correct consequence – e.g., destruction of habitat for wildlife		1	AO1 6.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
03.3	correct energy resource e.g., wave power		1	AO1 6.1.3
04.1	two marks for all bars correct one mark for one or two bars correct		2	AO2 6.1.3
04.2	they have gone down/decreased		1	AO2 6.1.3
04.3	greenhouse gases contribute to climate change		1	AO1 6.1.3
05.1	one that is being (or can be) replenished as it is used		1	AO1 6.1.3
05.2	66		1	AO2 6.1.3
05.3	tidal		1	AO1 6.1.3
05.4	not always reliable		1	AO1 6.1.3
06.1	$\text{power} = \frac{\text{energy transferred}}{\text{time}}$		1	AO1 6.1.1.4
06.2	$\text{power} = \frac{4\,500\,000}{600}$ = 7500 W		1 1 1	AO1 AO2 6.1.1.4

Question	Answers	Extra information	Mark	AO / Specification reference
06.3	the more powerful shower transfers the same amount of energy in a shorter time		1	AO2 6.1.1.4
07.1	wind/solar other renewables hydroelectricity	two marks for all three correct one mark for one or two correct	2	AO1 6.1.3
07.2	18 + 9 + 2 = 29% (yes) > 15%		1 1 1	AO2 AO3 6.1.3
07.3	one from: <ul style="list-style-type: none"> • geothermal • wave • tidal • biofuel 		1	AO1 6.1.3
08.1	two from: <ul style="list-style-type: none"> • oil • coal • (natural) gas 	one mark for each correct answer up to a maximum of two marks	2	AO1 4.1.3
08.2	suitable resource e.g., hydroelectric, tidal power	one mark for name of resource	1	AO1 4.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
08.3	two comments e.g., (as reliable than fossil fuels) tides happen regularly/twice a day or water can be released from a lake on demand and (less reliable than fossil fuels) the height/time of tides varies or rainfall to fill the lake is variable idea of droughts		2	AO3 4.1.3
08.4	carbon dioxide is a greenhouse gas it contributes to climate change		1 1	AO1 4.1.3
08.5	suitable comment e.g., power station affects habitats of wildlife		1	AO2 4.1.3
09.1	oil		1	AO1 6.1.3
09.2	the data are not continuous the names are categoric		1	AO2 6.1.3
09.3	correct suggestion e.g., cars were not adapted/able to use biofuels		1	AO3 6.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
09.4	(no) correct suggestion e.g., growing biofuels affects habitats of plants and animals/burning biofuels produces carbon dioxide/contributes to climate change or (yes) biofuels are carbon neutral because the plants they are obtained from take in carbon dioxide when they are growing which offsets the amount given off when they are burned	no mark for answer alone mark for correct justification of answer	1	AO3 6.1.3
10.1	the cup is made of polystyrene which is a good insulator		1	AO3 6.1.2.1
10.2	correct suggestion e.g., so that the water is all at the same temperature		1	AO1 6.1.2.1
10.3	change in temperature = 48.0 - 20.0 = 28.0		1	AO2 6.1.1.3
10.4	(change in thermal energy = mass × specific heat capacity × change in temperature) 30 000 = 0.25 × specific heat capacity × 28.0 specific heat capacity = $\frac{30000}{0.25 \times 28}$ = 4285(.8) = 4290 (J/kg°C)	answer given to three significant figures	1 1 1	AO2 6.1.1.3