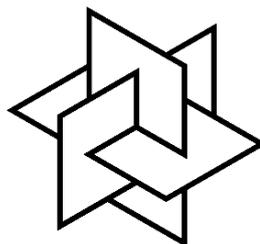

CE AT 13+

SCIENCE



ISEB

Independent Schools
Examinations Board

Core Physics Specimen Paper Mark Scheme

Date

Information

This is a suggested, not a prescriptive mark scheme.

Specimen

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Q.	Answer	Mark	Additional Guidance
1.	a) newton b)  c) frequency d) Venus e) sound f) it reflects light from the Sun g) twice as much	7	
2.	a) $3800 \times 24 = 91\,200$ hours	1	need to see own value
	b) i) speed = distance \div time	1	any correct arrangement
	ii) speed = $6\,400\,000\,000 \div 91\,200$ = 70 175 km/hr	2	allow 70 330 km/hr allow 70 180 km/hr
	c) there is no air/atmosphere there so there would be no drag force on the parachute	1 1	accept 'little' for 'no' accept 'parachute would not work'
3.	a) current causes the electromagnet to become magnetised this (induces the iron rod to become a magnet and) attracts the iron rod	1 1	
	b) 16.4 (cm)	1	
	c) $18 - 16.4 = 1.6$ cm	2	
	d) 0.2 kg	1	allow up to 5 significant figures i.e. allow 0.20000 kg
	e) $0.2 \text{ kg} \times 10 \text{ N/kg} = 2$ N	1 1	
	f) 2 N extends the spring by 3.2 cm so 1 N is needed to extend it by 1.6 cm	1 1	not essential to show working
	g) the magnet is doubled in strength but it is also closer to the iron rod so the effect is greater	1 1 1	

Q.	Answer	Mark	Additional Guidance
4.	a) N close to left end of magnet, S close to right end	1	
	b) complete loops touching right face of magnet, correct shape both arrows in correct direction	1 1	
	c) test to see if one end of the bar is repelled from the bar magnet if so, it must be a magnet if both ends are attracted, it is not a magnet	1 1 1	accept the use of a compass to test for repulsion accept 'if neither end is attracted nor repelled, it is not magnetic'
5.	a) gravitational (potential) kinetic	1 1	
	b) friction causes her kinetic energy (store) to be transferred to internal energy / heat thermal energy (store) (all this) thermal energy / internal energy / heat is dissipated / transferred to the surroundings	1 1	
	6.	a) Jupiter	1
b)	Jupiter is furthest from the Sun so receives less energy (from the Sun)	1 1	
	c) Jupiter has the lowest mean density so it is most likely to be gas (as gas has a lower density than rock)	1 1	

Q.	Answer	Mark	Additional Guidance
7. a)	(the force of) gravity	1	
b)	weather spying gps communications television space station	2	accept any two uses other than astronomical telescope
c)	i) the Moon must be further from Earth ii) the orbital period depends on the height of the satellite above the Earth	1 1	link between orbital period and height must be made
d)	<i>advantages:</i> space travel drives advances in technology human knowledge of our solar system/universe is advanced better understanding of other planets may help us protect the Earth <i>disadvantages:</i> distracts us from immediate problems on Earth money used in exploration could be better used to alleviate human suffering pollution is caused by launching rockets	4	any argued position which incorporates at least three points of advantage or disadvantage, including at least one of each
8. a)	the elastic vibrates causes air particles to vibrate/sound wave to travel to the ear	1 1	
b)	higher vibrates higher	1 1 1	
9. a)	geothermal	1	
b)	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">thermal</div> <div style="font-size: 2em; margin-right: 10px;">→</div> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">kinetic energy (store)</div> </div>	2	
c)	does not pollute/cause greenhouse gases/ contribute to global warming	1	accept any sensible suggestion
d)	biomass/hydroelectric/solar/tidal/wave/wind	1	accept any one of these
Total		60	