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Turn over

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FORMULAE	
You may find the following formulae useful.	
average velocity = $\frac{\text{displacement}}{\text{time}}$	$v = \frac{s}{t}$
acceleration = $\frac{\text{change in velocity}}{\text{time}}$	$a = \frac{(v - u)}{t}$
force = mass \times acceleration	$F = m \times a$
change in potential $=$ mass \times gravitational field strength \times change in height energy	$PE = m \times g \times h$
kinetic energy = $\frac{1}{2} \times mass \times (velocity)^2$	$KE = \frac{1}{2} \times m \times v^2$
electrical energy = voltage × current × time	$E = V \times I \times t$
$power = \frac{work \ done}{time \ taken}$	$P = \frac{W}{t}$
work done = force \times distance moved in the direction of the force	$W = F \times s$







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4

					Leav blan
Jane's schoo	ol has a new carpet in	the library.			
Some pupils the library.	s now get small electr	ic shocks from t	he metal door handle wh	en they leave	
(a) For her Here is	science homework, Ja Jane's answer.	nne was asked to	explain this.		
When I This is <u>conduc</u> The he	[walk on the new c because my shoes <u>tors.</u> at between my sho	arpet I becom and the carpet es and the car	e negatively charged. t are both electrical pet causes a transfer	of	
charge. When I	[put mv hand close	e to the metal	door handle, protons	iump	
from m	y hand to the hand	lle.	ador Hanare, <u>protons</u> ,	Jamp	
Her tead Use wo	cher has underlined th rds from the box to co	ree mistakes. prrect Jane's mist	akes.		
	electrons	insulators	neutrons		
	radiator		friction		
	mistake	C	orrect word		
cond	luctors				
heat					
prote	ons				
				(3)	
(b) Electric	shocks from static ele	ectricity can be a	nuisance		
(D) Electric	1 1 4 4	· · · · · · · · · · · · · · · · · · ·	be useful		1
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(b) Electric State on	e example where stat				
(b) Electric State on	e example where stat			(1)	Q2









(b) Kerry removes some of the weights from the hanger so the bricks start to slide down the slope. Leave blank The upward tension is 25 N. The force A is 19 N. (i) Calculate the resultant force on the weights. resultant force =N (1) (ii) Complete the sentence below by putting a cross (云) in the correct box. accelerate downwards □ The weight hanger will accelerate upwards □ (1) (1) (23 (1) (23				
(i) Calculate the resultant force on the weights. resultant force =N (1) (ii) Complete the sentence below by putting a cross (\mathbb{X}) in the correct box. accelerate downwards The weight hanger will accelerate upwards move at constant velocity (1) Q3 (Total 4 marks)	(b) Kerry removes some of the slope. The upward tension is 2. The force A is 19 N.	the weights from the hanger so the 5 N.	bricks start to slide down	Leave blank
$resultant force = \dots N$ (1) (ii) Complete the sentence below by putting a cross (\boxtimes) in the correct box. $accelerate downwards \square$ The weight hanger will $accelerate upwards \square$ move at constant velocity \square (1) Q3 (Total 4 marks)	(i) Calculate the resulta	ant force on the weights.		
 (ii) Complete the sentence below by putting a cross (x) in the correct box. accelerate downwards The weight hanger will accelerate upwards move at constant velocity (1) Q3 (Total 4 marks) 		resultant force =	N (1)	
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The weight hanger will accelerate upwards Image with the move at constant velocity Image with the move at constant velo		accelerate downwards	\boxtimes	
move at constant velocity (1) Q3 (Total 4 marks)	The weight hanger w	will accelerate upwards	\times	
(1) Q3 (Total 4 marks)		move at constant velocity		
(Total 4 marks)			(1)	
			(Total 4 marks)	



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(a)	The mass of the chandelier is 80 kg. Calculate the increase in gravitational potential energy when the chandelier is lifted 4.0 m. State the unit in your answer. The gravitational field strength is 10 N/kg	Leave blank
	The gravitational field strength is 10 N/kg.	
	increase in gravitational potential energy =	
	(3)	
(b)	State the work done against gravity in lifting the chandelier 4.0 m.	
	work done =(1)	
(c)	The motor works at a voltage of 230 V and a current of 1.6 A. Calculate the electrical energy supplied to the motor in 40 s.	
	$electrical energy = \dots $ (2)	
(d)	Suggest why your answer in part (a) is different to your answer in part (c).	
	(1)	Q5









(b) Iodine-123 is used to trace blood flow in a person's body. It is injected into the blood stream. The gamma rays it emits can be detected outside the body. (i) (i) Explain why an isotope with a much shorter half-life is not used. (i) (ii) Explain why an isotope with a much longer half-life is not used. (i) (iii) Explain why an isotope with a much longer half-life is not used. (i) (ii) Explain why an isotope with a much longer half-life is not used. (i) (iii) Explain why an isotope with a much longer half-life is not used. (i) (ii) Explain why an isotope with a much longer half-life is not used. (i) (iii) Explain why an isotope with a much longer half-life is not used. (i) (iii) Explain why an isotope with a much longer half-life is not used. (i) (i) (ii) Explain why an isotope with a much longer half-life is not used. (i) (iii) (iii) Explain why an isotope with a much longer half-life is not used. (i) (iii) (iiii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iii)			Leave
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	 (1) Q	7
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