

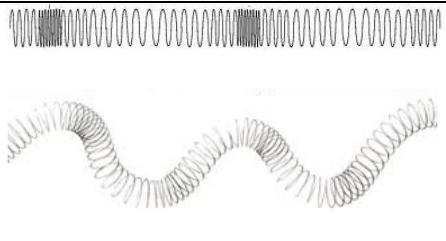


FORM 5

PHYSICS

MARKING SCHEME

SECTION A			70 MARKS
Question	Answer	Mark	Additional Guidelines
1. a.	created; destroyed; changed	1,1,1	
1. b. i.	electrical	1	
1. b. ii.	light	1	
1. b. iii.	sound	1	
1. b. iv.	heat	1	
1. c. i.	30 W	1	accept '30'
1. c. ii.	90%	2	accept also '0.9'
2. a. i.	178 g	2	1 mark for working
2. a. ii.	0.178 kg	1	accept '0.178'
2. a. iii.	1.78 N	2	1 mark for correct unit
2. b. i.	redwood	1	
2. b. ii.	ρ of redwood < ρ of water	1	
2. c. i.	equal to 7.9 g/cm ³	1	
2. c. ii.	ρ depends on material only	2	
3. a. i.	0.8 m	2	1 mark for correct unit
3. a. ii.	anti-clockwise	1	
3. b.	arrow pointing downwards from pivot	1	
3. c. i.	400 Nm	2	1 mark for correct unit
3. c. ii.	500 N	2	1 mark if student applies principle of moments
3. c. iii.	1200 N	2	1 mark for correct unit
4. a. i.	ray of light through optical centre	1	
4. a. ii.	virtual image	1	
4. a. iii.	magnified	1	accept 'upright'
4. a. iv.	magnifying glass	1	
4. b. i.	3 cm	1	accept '3'
4. b. ii.	4 cm	1	accept '4'
4. b. iii.	x 2	2	accept '2'
4. b. iv.	6 cm	2	accept '6'
5. a. i.	diode	1	
5. a. ii.	switch	1	
5. a. iii.	thermistor	1	
5. a. iv.	light dependent resistor	1	
5. b. i.	6 Ω	2	1 mark for correct unit
5. b. ii.	2 A	2	1 mark for correct unit
5. b. iii.	24 W	2	1 mark for correct unit

Question	Answer	Mark	Additional Guidelines
6. a. i.	0.5 m ²	2	1 mark for correct unit
6. a. ii.	1400 Pa or 1400 N/m ²	2	1 mark for correct unit
6. b. i.	increases; as area decreases, pressure increases	1,1	accept that area and pressure are inversely proportional
6. b. ii.	increases; as force increases, pressure increases	1,1	accept that force and pressure are directly proportional
6. c.	less contact area results in higher pressure on ground giving more grip	1,1	
7. a.		1 1	accept alternative diagrams which show clearly the difference between the two types of waves
7. b.	longitudinal wave – in and out transverse wave – up and down	1 1	
7. c.	transverse and longitudinal according to the diagrams	1 1	
7. d. i.	longitudinal waves	1	
7. d. ii.	transverse waves	1	
7. e.	165 Hz	2	1 mark for correct unit

SECTION B		100 MARKS	
Question	Answer	Mark	Additional Guidelines
8. a.	arrow pointing away from K towards L	1	
8. b.	straight line with arrow from N to S	2	no marks awarded in absence / incorrect direction of arrow
8. c.	a magnetic field is set up around the wire when an electric current flows through it	1 1	
8. d. i.	out of the page towards you	1	
8. d. ii.	Fleming's left hand rule	1	
8. d. iii.	<ul style="list-style-type: none"> • increase current flow • use stronger magnets (stronger external field) • increase number of wires in the magnetic fields 	1,1	accept any TWO
8. d. iv.	no force acts on the wire	1	
8. e. i.	Graph <ul style="list-style-type: none"> • has correct axis • is drawn over more than half the graph • has correct scale • is a straight line • passes through origin 	1 1 1 1 1	

Question	Answer	Mark	Additional Guidelines
8. e. ii.	force is directly proportional to current	1	
8. e. iii.	gradient = 2.5 ± 0.1 N/A	2	1 mark for correct unit
8. e. iv.	1.2 A	2	
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9. a. i.	20 m/s	1	accept '20'
9. a. ii.	50 s	2	1 mark for correct unit
9. a. iii.	0.4 m/s^2	3	1 mark for correct working 1 mark for correct unit
9. b. i.	750 m	3	1 mark for correct working 1 mark for correct unit
9. b. ii.	3250 m	2	
9. b. iii.	9.29 m/s	2	1 mark for correct unit
9. c. i.	Andrew notes the force of the data logger required to move a 100 g mass more masses are added and each time the force required to move the mass is recorded	1 1	
9. c. ii.	in the form of a table and a graph	1 1	
9. c. iii.	same ground surface to have same friction	1	do not accept 'same area of contact'
9. c. iv.	force is directly proportional to the masses added	2	accept 'force applied is proportional to the masses added'
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10. a. i.	protons	1	
10. a. ii.	protons, neutrons	1,1	
10. b. i.	atoms/nuclei of the same element having the same proton number Z but different nucleon number A	2	
10. b. ii.	${}_{6}^{12}\text{C}$	2	
10. c. i.	background	1	
10. c. ii.	rocks; bricks of buildings; Sun; outer space	1,1	any TWO
10. c. iii.	Geiger-Muller tube counter (scaler or rate meter)	1 1	
10. d. i.	1600	1	
10. d. ii.	the time taken for half the nuclei of a sample of a radioactive substance to decay	1 1	
10. d. iii.	5 min	3	1 mark for correct working
10. d. iv.	118 counts/min	2	

Question	Answer	Mark	Additional Guidelines
11. a.	the current through a conductor is directly proportional to voltage across the conductor provided that the temperature of the conductor is constant	2	
		1	
11. b. i.	K - lamp; M - ammeter	1, 1	
11. b. ii.	appropriate positions	1, 1	
11. b. iii.	changes the resistance and the current of the circuit	1, 1	
11. c. i.	graph drawing through all pts.	1	
11. c. ii.	1.4 A	1	
11. c. iii.	9 V	1	
11. c. iv.	4 Ω	2	1 mark for correct unit
11. c. v.	No	1	
11. c. vi.	graph is not a straight line passing through origin	1	accept 'graph is a curve'
		1	
11. d. i.	melts	1	do not accept 'lamp burns'
11. d. ii.	no current flows	1	
11. d. iii.	infinity	1	accept 'very large resistance'
12. a. i.	diagram to include container with juice, heater connected to a circuit, thermometer and insulation, all labelled	1	details of the circuit are not required
		1	
		1	
		1	
12. a. ii.	mass of orange juice; change in temp. of orange juice; quantity of heat supplied	1,1,1	
12. a. iii.	stirring	1	
12. a. iv.	lagging around container, repeated readings, etc.	1,1	
12. b. i.	400 J	2	1 mark for correct unit
12. b. ii.	400 J energy at top is equal to energy at bottom / principle of conservation of energy	1	accept '400'
		1	
12. b. iii.	kinetic; heat; sound	1,1,1	
12. c.	0.46 $^{\circ}\text{C}$ or 0.5 $^{\circ}\text{C}$	3	1 mark for correct working 1 mark for correct unit

Please Note: When marking questions that involve calculations, apply the 'follow through' rule. This means that if a student gives a wrong value for part (a) of a question and then uses the value of (a) in the subsequent calculations, marks should be deducted for part (a) only. The subsequent parts should be given full marks if these are correct.