Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

Question number	Answer	Mark
(a)	B	(1)

Question number	Answer	Mark
(b)	substitution into correct equation (1) = 1.9 × 10.0 × 9.0 answer (1) 171 (J) (which is about 170 J) Answer must be shown to 3 significant figures	(2)

Question number	Answer	Mark
(c)	B	(1)

Question number	Answer	Mark
(d)	An explanation that combines identification – understanding (1 mark) and reasoning/justification – understanding (2 marks): • the coil contains wires which have a resistance (1) • and current in the wire is due to movement of electrons through (close-packed) lattice of positive ions (1) • hence collisions between electrons and ions in the lattice transfer energy from electrons to the lattice (causing the temperature of the wires/coil to rise) (1)	(3)

Q2.

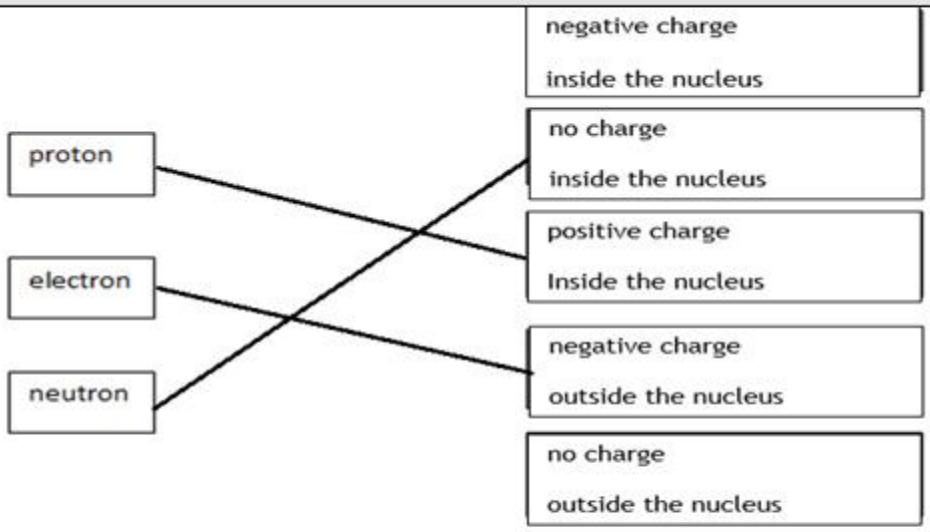
		Indicative Content	Mark
		A explanation including some of the following points Light dependent resistors (LDR) • Resistance changes with light intensity • Bright light , low resistance • No light (dark), high resistance • Low resistance gives high current.(RA) Thermistor • Resistance changes with temperature • Negative temperature coefficient • High temperature, low resistance • Low temperature, high resistance • Low resistance gives high current (RA)	**(6)**
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited explanation linking light affecting LDR AND heat affecting thermistor OR a correct relationship for one device, e.g. thermistors change resistance when the temperature changes and LDRs change resistance when it gets dark OR the resistance decreases/ current increases of a LDR when the light gets brighter • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple explanation correctly linking the temperature and light with resistance or current for both devices OR a correct relationship for one device with a link to the way this affects the current and resistance.	

		e.g. the resistance of a LDR increases when the light gets dimmer and when the temperature lowers the resistance of a thermistor increases OR the resistance of a LDR decreases when the light gets brighter and this increases the current • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	**5 - 6**	• a detailed explanation including the qualitative relationships for both devices and a link to the way resistance change affects the current in BOTH of them, e.g. the resistance of a LDR is less when the light gets brighter which increases the current. When the temperature lowers the resistance of a thermistor increases. This means that the current will decrease as the thermistor cools down. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Q3.

	Answer	**Acceptable answers**	**Mark**
	A suggestion to include any 2 of the following • (LED) turns on and off • as voltage/current changes direction/from +ve to –ve/ twice each second (1) • (LED) on for (+ve) part of cycle (1) • (LED) off for (-ve) part of cycle (1)	Flash(es) / flicker(s) (on and off) current changes every 0.25 s /4 times each second Turns on twice each second = 2 marks Only on when voltage/current is +ve gains both marks	**(2)**

Q4.

Question Number	Answer	Mark
	 One mark for each correct line. More than one line from a box on the left loses the mark for that box.	(3)