

QU.	SCHEME	TARGET GRADE	
1.	(a) (i) greater	F	M1
	(ii) P.E. (or equiv.) has increased OR work done lifting case	F	A1
	(b) (i) greater	F	M1
	(ii) it is moving OR now has K.E. (or equiv.)	F	<u>A1</u> <u>4</u>
2.	(a) insulator	F	B1
	(b) radiation	F	B1
	(c) conductor	F	B1
	(d) convection	F	<u>B1</u> <u>4</u>
3.	(a) arrow(s) clockwise	C	B1
	(b) 3 circles (by eye) around wire (need not be concentric, ignore other lines)	F	B1
	circles concentric with wire (by eye)	C	<u>B1</u> <u>3</u>
4.	(a) (i) 1020 - 610	F	C1
	410 (g)	F	A1
	(ii) mass/volume	F	C1
	his (i)/500	F	C1
	0.82 e.c.f.	F	A1
	g/cm^3	C	B1
	(iii) use measuring cylinder/pipette/narrower jug/burette	C	B1
	(b) level shown below oil level	C	<u>B1</u> <u>8</u>

9. (a) avoid problems with echoes C
- (b) time would have been too small to measure (with stopwatch) C B1
OR to give a greater time interval OR for accuracy
- (c) tape-measure OR trundle wheel OR metre rule F B1
 OR range-finder OR calibrated strides
- (d) light travels fast/ instantaneously/ at 3×10^8 m/s C B1
 sound travels slowly/ slower/ at 330 (± 30) m/s F B1
- (Note: "sound travels much slower than light"
 OR "light travels much faster than sound" scores B1, B1)
"sound travels slower than light" etc gets B1, B0
- (e) speed = distance/time allow $s = d/t$ F C1
 238/0.7 F C1
 340 F A1
 m/s C B1
- (f) effect of air movement OR take average OR repetition to check C B1
NOT "for accuracy", unless adequately explained 10

allow answers
 in form of
 current in
 field
 experiences a
 force

10. (a) (i) moves (ignore any direction) *NOT vibrates* F B1
- (ii) conductor experiences force in magnetic field C B1
 current-carrying conductor C B1
- (iii) moves in opposite direction to (i) F B1
- (b) (i) commutator OR split ring *allow commutator* C B1
NOT slip rings
 brush OR contact *NOT spring* F B1
 magnet OR pole F B1
- (ii) commutator OR split ring e.c.f. from (i) C B1
- (iii) *rotates?* rotates other way / to the left F B1
 rotates anticlockwise 9

		F	B1
		C	B1
11. (a)	current causes magnetic field		
	iron reeds magnetised		
	magnetised in same direction OR adjacent ends opposite polarity	C	B1
	(ends) attract each other	C	B1
(b)	temperature rises	F	B1
	resistance decreases	F	B1
	(eventually) enough current to close relay	C	B1
	current flows in lamp circuit or equiv.	C	<u>B1</u>
			<u>8</u>
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12. (a) (i)	ray refracted down at A	F	M1
	not below normal	C	A1
	refracted down at 2nd surface	F	B1
	(ii) refraction / refracted OR deviation	F	B1
(b)	violet greater refraction than red at A	F	B1
	2 rays diverging all the way to the screen from A <i>condone repetition of errors in (i)</i>	C	B1
(c)	spectrum (or equiv.) OR colours OR rainbow <i>NOT dispersion beyond</i>	F	B1
(d) (i)	X marked above position of red	F	B1
	(ii) not in visible spectrum OR invisible	C	B1
	(iii) any example of a suitable I.R. detector <i>NOT "IR/heat sensor/detector"</i>	C	<u>B1</u>
			<u>10</u>