Rewarding Learning

General Certificate of Secondary Education
2011

Science: Physics

Paper 1
Foundation Tier

[G7602]

WEDNESDAY 25 MAY, MORNING

MARK SCHEME

					AVAILABLE MARKS
1	(a)	(i)	Average speed = distance/time	[1]	
			= 36/3	[1]	
			= 12 (cm/s)	[1]	
		(ii)	Kinetic energy – decreases	[1]	
			Potential energy – increases	[1]	
			Weight – stays the same	[1]	
		(iii)	Friction or weight/gravity	[1]	
		(iv)	0.075 kg	[2]	
			Give 1 mark if 1 kg identified as 1000 g		
		(v)	Momentum = mass × velocity (speed)	[1]	
			= 0.075 × 0.2	[1]	
			= 0.015 allow ecf for mass	[1]	
			kg m/s	[1]	
	(b)	(i)	Density = mass/volume	[1]	
		(ii)	Use the balance to find the mass of number of coins	[1]	
			Read the volume of water in the graduated cylinder	[1]	
			Add the coins to the water	[1]	
			Note the new volume	[1]	
			Subtract the two volumes to find volume of the coins	[1]	
			Use the formula to find density	[1]	20

AVAILABLE MARKS

2 **(a)** **(i)** Renewable – limitless/infinite supply/replaced in a lifetime
can be used again and again [0] [1]

(ii) Coal – non-renewable
Nuclear – non-renewable [3]
Hydroelectric – renewable
Geothermal – renewable
Biomass – renewable ½ each round up

(b) **(i)** 14580 J [1]

(ii) Heat and sound (both needed for the mark) [1]

(c) **(i)** Black [1]

(ii) Infra-red [1]

(iii) It receives heat by convection and radiation [1]
B and C by radiation only [1]

(iv) Same distance from ball [1]

(d) **(i)** Shiny outside Poor emitter of radiation/heat [1]

(ii) Shiny inside Good reflector/poor absorber of radiation/heat [1]

(e) **(i)** electron [1]

(ii) molecule [1]

(iii) Electrons [1]
and collide with atoms/molecules/ions [1]

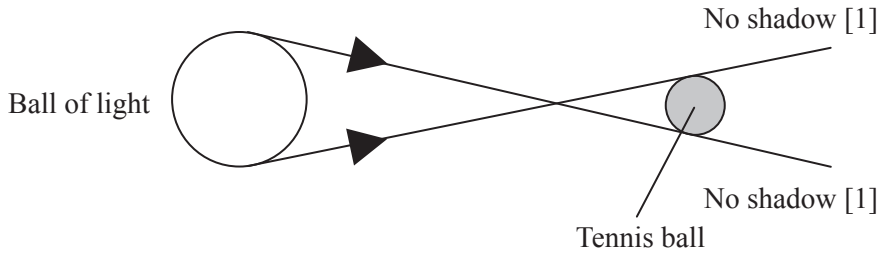
(f) **(i)** Rivets contract as they cool [1]

(ii) Strip bends with copper on the outside [1]
Needle moves across the scale to the right [1] 20

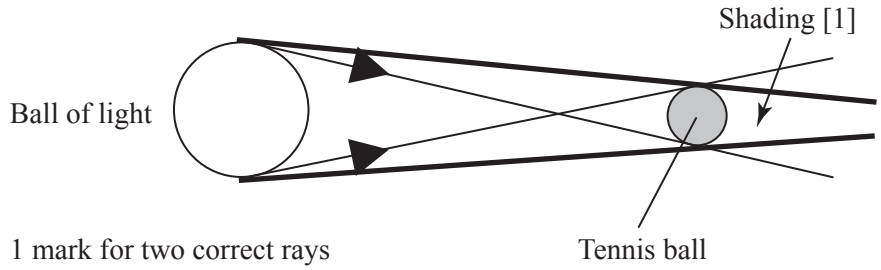
AVAILABLE MARKS

3 **(a)** **(i)** Light travels in straight lines or for accuracy [1]

(ii) No shadow above or below the drawn rays [2]



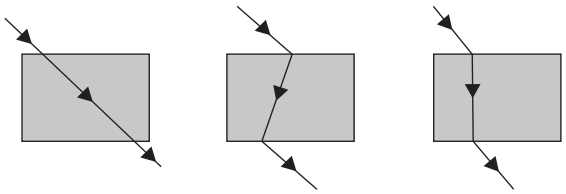
(iii)



[2]

1 mark for two correct rays

(b)



[3]

(c) **(i)** I same distance behind mirror as O in front ±1 div.
accept an unlabelled dot or cross [1]

(ii) Ray from O to mirror [1]
Reflected ray comes from I no ecf for position of I [1]

(d) **(i)** Parallel rays converge to a point to the right of lens on P axis [1]
Focal length marked distance from lens to this point [1]

(ii) Both parallel rays diverge from R axis after passing through lens [1]

(iii) Place lens in front of a screen
Move toward/away from screen or adjust position
Until sharp image seen/image in focus
Measure distance from lens to screen/lens to image [4]

QWC [2]

20

Response	Mark
Candidates describe in detail using good spelling, punctuation and grammar the main points shown above. The form and style is of a high standard and specialist terms are used appropriately at all times.	2
Candidates make some reference to the main points shown above using satisfactory spelling, punctuation and grammar. The form and style is of a satisfactory standard and they have made some reference to specialist terms.	1
Candidates make little reference to the main points shown above using limited spelling, punctuation and grammar. The form and style is of a limited standard and they have made no use of specialist terms.	0

AVAILABLE MARKS

4 **(a)** **(i)** Friction [1]

(ii) He lost electrons [1]

(iii) Statement 2 is correct [1]

(iv) Only in the metal are the electrons free to move or converse [1]

(b) **(i)** Covering marked as insulator [1]
End (copper) marked as conductor [1]

(ii) To identify them [1]

(iii) To protect the wires [1]

(iv) Green and yellow (both needed) [1]

(v) Metal part/casing/sole [1]

(c) **(i)** R = V/I [1]
= 1.5/0.25 [1]
= 6 (Ω) [1]

(ii) Bulbs in parallel [1]
Battery in series with bulbs [1]
Switch in series with battery [1]
ALL symbols correct accept –⊗– or –◠– [1]

(iii) Voltmeter in parallel with bulb [1]

(iv) Ammeter in series [1]

(v) Brighter – more current (both needed)/more energy supplied/second
more energy supplied [0] [1]

20

								AVAILABLE MARKS
5	**(a)**	**(i)**	Electron	(1/1840)	–1	8	Outside nucleus	
			Neutron	1	0	9	In the nucleus	[6]
			Proton	1	+1	8	In the nucleus	
			½ each round up					
		(ii)	Nuclei with same number of protons					[1]
			Different number of neutrons					[1]
		(iii)	Nucleus if no further [1]					
			A particle consisting of 2 protons and 2 neutrons					[2]
		(iv)	Alpha particles					[1]
			Damages cells/causes cancer					[1]
			Dangerous [0]					
	(b)	**(i)**	The reading/count rate will reach a max/increase/will start					[1]
		(ii)	Gamma					[1]
			Only one that can penetrate the ground					[1]
			or Radiation needs to penetrate the ground					
		(iii)	Time for the activity to					[1]
			half its initial value					[1]
		(iv)	15 hrs long enough <u>to be detected</u>					[1]
			1 minute too short <u>to be detected</u>					[1]
			1 year <u>dangerous</u> radiations for too long					[1]
								20
							Total	**100**