



Rewarding Learning

**General Certificate of Secondary Education
2011**

Science: Physics

**Paper 1
Foundation Tier**

[G7602]

WEDNESDAY 25 MAY, MORNING

**MARK
SCHEME**

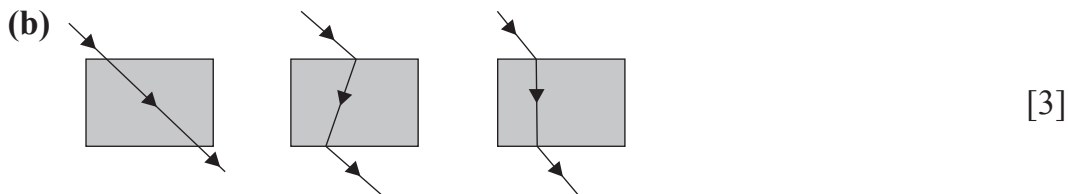
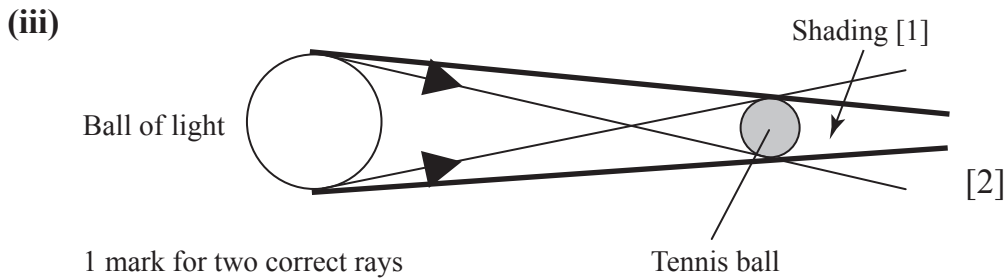
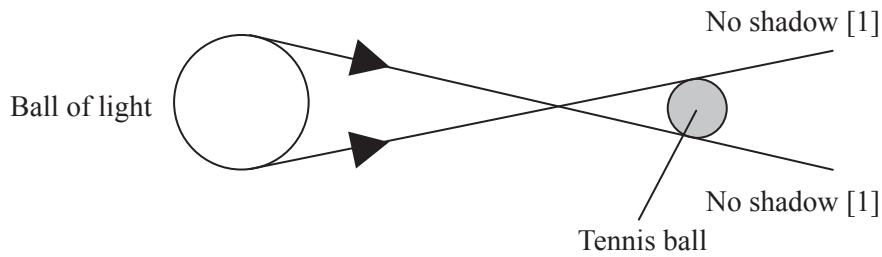
2	(a) (i) Renewable – limitless/infinite supply/replaced in a lifetime can be used again and again [0]	[1]
	(ii) Coal – non-renewable Nuclear – non-renewable Hydroelectric – renewable Geothermal – renewable Biomass – renewable ½ each round up	[3]
(b)	(i) 14580 J	[1]
	(ii) Heat and sound (both needed for the mark)	[1]
(c)	(i) Black	[1]
	(ii) Infra-red	[1]
	(iii) It receives heat by convection and radiation B and C by radiation only	[1] [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 and collide with atoms/molecules/ions	[1] [1]
(f)	(i) Rivets contract as they cool	[1]
	(ii) Strip bends with copper on the outside Needle moves across the scale to the right	[1] [1]

AVAILABLE
MARKS

20

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

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



(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
20

- 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]
 $= 6 (\Omega)$ [1]
- (ii) Bulbs in parallel [1]
Battery in series with bulbs [1]
Switch in series with battery [1]
ALL symbols correct accept $\text{---}\otimes\text{---}$ or $\text{---}\ominus\text{---}$ [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]

							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 or Radiation needs to penetrate the ground					[1]	
	(iii)	Time for the activity to half its initial value					[1] [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]			
Total							20	
							100	