



General Certificate of Secondary Education  
2011

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**Science: Physics**

Paper 1  
Foundation Tier

[G7602]

WEDNESDAY 25 MAY, MORNING

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**MARK  
SCHEME**

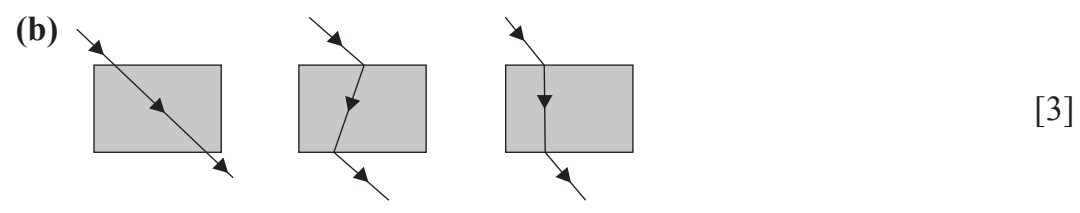
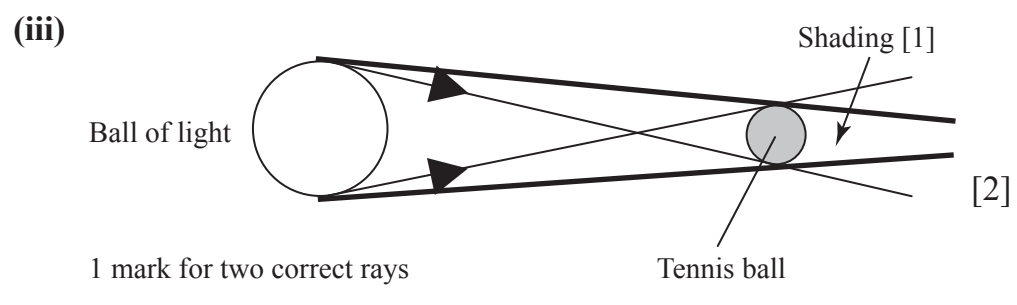
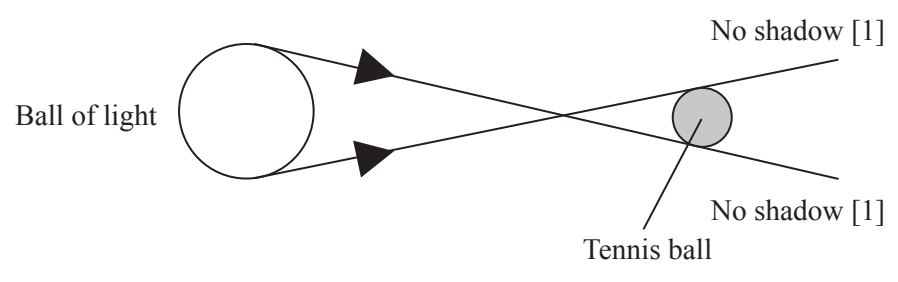


2	(a) (i) Renewable – limitless/infinite supply/replaced in a lifetime can be used again and again [0]	[1]
	(ii) Coal – non-renewable Nuclear – non-renewable Hydroelectric – renewable Geothermal – renewable Biomass – renewable      ½ each round up	[3]
	(b) (i) 14580 J	[1]
	(ii) Heat and sound      (both 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  $\pm 1$  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]

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  $\otimes$  or  $\ominus$  [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]

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]		

**Total**

AVAILABLE  
MARKS

20

**100**