



Cambridge IGCSE™

PHYSICS

0625/31

Paper 3 Core Theory

May/June 2020

MARK SCHEME

Maximum Mark: 80

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

This document consists of **10** printed pages.

Question	Answer	Marks
1(a)(i)	(average thickness =) $3.8 \div 20$	C1
	(average thickness =) 0.19 (cm) (which is about 0.2 cm)	A1
1(a)(ii)	any one from: wire(s) not touching OR wire stretched (in places) OR ruler not at zero (owtte) OR wire(s) overlapping OR eye not directly above ruler (owtte)	B1
1(b)	density = mass $\div$ volume OR $\rho = \frac{m}{V}$ in any form.	C1
	(ρ =) $148 \div 16.6$	C1
	(ρ =) 8.9 (g / cm ³)	A1
1(c)	measuring cylinder partially filled with water coil submerged in water (owtte) new volume noted volume of wire = difference or increase in volume(s)	B4

Question	Answer	Marks
2(a)(i)	6.0 (cm)	B1
2(a)(ii)	13.0 (cm)	B1
2(a)(iii)	(ii) – (i)	B1
2(b)	shape	B1
	size	B1

Question	Answer	Marks
3(a)(i)	high speed	B1
	(in) any or all directions or random (motion)	B1
3(a)(ii)	collisions	M1
	(of molecules) with walls of box	A1
3(b)	widely separated (owtte) in gas to very close / touching in solid	B1

Question	Answer	Marks
4(a)	(s =) $d \div t$ in any form	C1
	(s =) $200 \div 6.4$	C1
	(s =) 31 (m / s)	A1
4(b)	P – (constantly) accelerates (from 5 m / s)	B1
	Q – constant speed (of 17.5 m / s)	B1
	R – (non-constant) decelerates (from 17.5 m / s to rest)	B1
	S – at rest or stationary	B1
4(c)	(skis have) large (surface) area	B1
	(so) less pressure (on snow / ground)	B1

Question	Answer	Marks
5(a)	(moment =) force $\times$ distance (from pivot)	B1
	(moment =) 5.0×40	B1
5(b)	(sum of) clockwise moments = (sum of) anticlockwise moments	C1
	$200 = (2.0 \times 10) + (F \times 60)$	C1
	$F = (200 - 20) \div 60$ OR $180 \div 60$	C1
	(F =) 3.0 (N)	A1

Question	Answer	Marks
6(a)(i)	$^{\circ}\text{C}$ or degrees celcius	B1
6(a)(ii)	arrow at 100 (labelled steam)	B1
6(b)	use OR consequence of thermal expansion identified	B1
6(c)(i)	black is better / best absorber	B1
	(so) temperature of wax rises faster on black plate	B1
6(c)(ii)	(for a valid comparison all independent) variables must be the same	B1
	plates / discs should be equal distances (from heater) (owtte)	B1

Question	Answer	Marks
7(a)(i)	60(°)	B1
7(a)(ii)	normal correctly positioned	B1
	correct reflected ray at 60° to normal	B1
	same value as (i)	B1
7(b)	horizontal ray drawn to continue through F	B1
	ray through principal focus continues parallel to axis	B1
	image indicated in correct position	B1
	image indicated with correct orientation	B1

Question	Answer	Marks
8(a)(i)	(wavelength =) 40 (cm)	B1
8(a)(ii)	wave drawn with greater amplitude	B1
8(b)	20 to 20 000	B1
	Hz or hertz	B1

Question	Answer	Marks
9(a)(i)	N and S poles correctly labelled N S	B1
9(a)(ii)	(iron bar and magnet) attract (each other)	B1
	(iron) bar becomes an induced magnet	B1
	with opposite pole next to pole of magnet	B1

Question	Answer	Marks
9(b)(i)	(charge on Q is) negative	B1
	(charge on R is) positive	B1
9(b)(ii)	(ball) Q is repelled (by negative charge on P)	B1
	has same charge (as on P)	B1

Question	Answer	Marks
10(a)(i)	thermistor	B1
10(a)(ii)	correct symbol for ammeter drawn	B1
	correct symbol for voltmeter drawn	B1
	both meters correctly positioned in circuit	B1
10(b)(i)	12 (Ω)	B1
10(b)(ii)	smaller (than A)	B1

Question	Answer	Marks
11(a)(i)	correct symbol for fuse drawn	B1
11(a)(ii)	a large current flows to earth / in the live wire OR fuse is connected into live wire OR fuse contains thin / low melting point wire	B1

Question	Answer	Marks
	any two from: current heats (fuse) wire fuse melts / blows (power supply circuit / metal case) is disconnected from mains (supply)	B2
11(b)	$V_s / V_p = N_s / N_p$ in any form	C1
	$(V_s =) (64 \times 240) \div 960$	C1
	16 (V)	A1

Question	Answer	Marks
12(a)	beta / β AND gamma / γ	B1
12(b)	$(137 - 56 =) 81$	B1
12(c)	idea of three half-lives	C1
	$36 \div 8$	C1
	4.5 (mg)	A1