Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/33**

Paper 3 Core Theory **October/November 2016**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

© UCLES 2016

Question	Answer	Marks
1(a)	100 (km/h)	**B1**
1(b)	boxes L – M **AND** R – S ticked	**B1**
1(c)	0.1 hours identified	**C1**
	6 (minutes)	**A1**
1(d)	area under graph	**C1**
	$0.5 \times 0.2 \times 100$	**C1**
	10 (km)	**A1**
	Total	**7**

Question	Answer	Mark
2(a)(i)	constant speed/velocity	**B1**
2(a)(ii)	75 N	**B1**
	forwards	**B1**
2(b)	friction	**B1**
	two surfaces rubbing together owtte	**B1**
	Total	**5**

© UCLES 2016

Question	Answer	Marks
3(a)(i)	maximum displacement owtte	**B1**
3(a)(ii)	moving with maximum speed **OR** mid-point of oscillation	**B1**
3(b)(i)	energy cannot be created or destroyed (but can be changed) owtte	**B1**
3(b)(ii)	any **three** from: stretched spring has elastic potential energy potential energy converted to kinetic energy each oscillation energy transferred to surroundings oscillations become smaller (in amplitude)	**B3**
	Total	**6**

© UCLES 2016

Question	Answer	Marks
4(a)	W = m × g in any form	**C1**
	10 000 (N)	**A1**
4(b)(i)	pressure = force/area in any form	**C1**
	(10 500 / 4) / 125	**C1**
	21 (N/cm^2)	**A1**
4(b)(ii)	(weight spread over) larger area owtte	**B1**
	pressure reduced	**B1**
4(c)(i)	moment = force × distance from pivot in any form	**C1**
	200 × 0.25 **OR** 50	**A1**
	Nm	**B1**
4(c)(ii)	force applied further away from wheel nut owtte	**B1**
	Total:	**11**

© UCLES 2016

Question	Answer	Marks
5(a)	air above water becomes less dense	**B1**
	cool breeze occurs as a result of convection	**B1**
	warm air rises	**B1**
5(b)	(jacket) traps air	**B1**
	air is an insulator **OR** prevents convection	**B1**
	Total:	**5**

Question	Answer	Marks
6(a)(i)	arrow on incident ray pointing towards mirror **OR** arrow on reflected ray pointing away from mirror	**B1**
6(a)(ii)	*i* **AND** *r* both correctly labelled	**B1**
6(a)(iii)	same distance from mirror as candle	**B1**
	same size as the candle	**B1**
6(b)	angle of incidence = angle of reflection	**B1**
	Total:	**5**

© UCLES 2016

Question	Answer	Marks
7	Person A : lightning seen and thunder heard at (almost) same time	**B1**
	Person B : lightning seen first OR thunder heard later/after flash of lightning	**B1**
	Explanation:	
	light travels faster than sound **OR** reverse argument	**B1**
	sound has further to travel to B so time delay is greater or similar argument **OR** distances for A are so short that no observable difference in time.	**B1**
	Total:	**4**

Question	Answer	Marks
8(a)	any named insulator, e.g. cotton, string etc.	**B1**
8(b)	1 = attract	**B1**
	2 = repel	**B1**
	3 = repel	**B1**
8(c)	(sphere) is rubbed with a cloth	**B1**
	<u>electrons</u> move off (sphere) owtte	**B1**
	Total:	**6**

© UCLES 2016

Question	Answer	Marks
9(a)	a.c. current changes direction **OR** d.c. one direction only	**B1**
9(b)(i)	variable resistor	**B1**
9(b)(ii)	changes the amount of current	**B1**
	changes speed of motor fan	**B1**
9(c)(i)	V = IR in any form	**C1**
	24/8.5	**C1**
	2.82	**A1**
	A **OR** amps	**B1**
9(c)(ii)	5 (A)	**B1**
9(d)	protect user from electric shock	**B1**
	Total:	**10**

© UCLES 2016

Question	Answer	Marks
10(a)	electrons	**B1**
	protons **AND** neutrons	**B1**
10(b)	same number of protons **OR** proton number **AND** different number of nucleons **OR** neutrons/nucleon number	**B1**
10(c)	alpha – most ionising	**B1**
	beta – carries a negative charge	**B1**
	gamma – most penetrating	**B1**
	Total:	**6**

© UCLES 2016

Question	Answer	Marks
11(a)	X = step up **AND** Y = step down	**B1**
11(b)	$V_p/V_s = N_p/N_s$ **OR** V_s = 132 000 /(24 000/2000) **OR** turns ratio, 12 calculated 11 000 (V)	**C1** **A1**
11(c)	any two from: less heating **OR** less energy **OR** power wasted **OR** more efficient thinner wires **OR** cables fewer power stations lower current in cables transmit longer distances (without drop in power)	**B2**
	Total:	**5**

© UCLES 2016

Question	Answer	Marks
12(a)(i)	correct symbols for battery **AND** switch	**B1**
	connected in series with coil	**B1**
12(a)(ii)	increasing turns on coil	**B1**
	increasing the current	**B1**
	increasing the strength of the magnetic field	**B1**
12(b)(i)	coil in series with galvanometer	**B1**
	magnet moved relative to coil	**B1**
	deflection on galvanometer	**B1**
12(b)(ii)	more **OR** less coils **OR** number of coils	**B1**
	faster **OR** slower movement **OR** speed of magnet **OR** coil	**B1**
	Total:	**10**

© UCLES 2016