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

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

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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**

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**

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

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**

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**

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**

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**

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**

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**