



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**PHYSICS**

**0625/33**

Paper 3 Core Theory

**October/November 2016**

MARK SCHEME

Maximum Mark: 80

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**Published**

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

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

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

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

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

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

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

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

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

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



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

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