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

**PHYSICS** **0625/32**

Paper 3 Core Theory **May/June 2017**

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

| Question | Answer | Marks |
|---|---|---|
| 1(a) | flexible rule/tape measure/measuring tape | **B1** |
| 1(b)(i) | 58.75 (s) | **B1** |
| 1(b)(ii) | speed = distance ÷ time in any form | **C1** |
| | 0.85 (m / s) | **A1** |
| 1(b)(iii) | 7.12 (s) | **B1** |
| | **Total:** | **5** |

| Question | Answer | Marks |
|---|---|---|
| 2(a)(i) | 6500 (g) | **B1** |
| 2(a)(ii) | density = mass ÷ volume in any form | **B1** |
| | 1.3 | **A1** |
| | $g / cm^3$ | **B1** |
| 2(b) | density (of brush) is less (than) density of paint | **B1** |
| | **Total:** | **5** |

| Question | Answer | Marks |
|---|---|---|
| 3(a) | weight = mass × gravitational field strength in any form | C1 |
| | 20.0 × 10.0 | C1 |
| | 200 (N) | A1 |
| 3(b)(i) | moment = force × (perpendicular) distance (from pivot) in any form | C1 |
| | 180.0 × 2.5 | C1 |
| | 450 (N m) | A1 |
| 3(b)(ii) | 2nd box down ticked decrease the length of the arm holding the sun-shade | B1 |
| | **Total:** | **7** |

| Question | Answer | Marks |
|---|---|---|
| 4(a) | radiation | **B1** |
| 4(a)(ii) | thermometer near door or B is at higher temperature | **B1** |
| | any 2 from:<br><br>darker colours are better absorbers (of thermal energy)<br>darker colours are better emitters (of thermal energy)<br>white/lighter colours are better reflectors (of thermal energy)<br>white/lighter colours are poorer absorbers (of thermal energy)<br>white/lighter colours are poorer emitters (of thermal energy) | **B2** |
| 4(b) | any 3 from:<br><br>cold air is denser (than warm air)<br>cold air will fall<br>the cold air is warmed and expands<br>less dense/warm air rises or replaces the cold air<br>(forming a) convection (current) | **B3** |
| | **Total:** | **7** |

| Question | Answer | Marks |
|---|---|---|
| 5(a) | any two from:<br><br>more collide with walls<br>more often<br>so pressure is greater (inside bag) | **B2** |
| 5(b) | density (of sea water)<br>depth (of sea water)<br>(in either order) | **B2** |
| 5(c)(i) | barometer | **B1** |
| 5(c)(ii) | 3.4 or 1.3 seen | **C1** |
| | 2.1 | **C1** |
| | 1035.7 | **A1** |
| | **Total:** | **8** |

| Question | Answer | Marks |
|---|---|---|
| 6(a)(i) | normal line drawn at 90° to mirror by eye | **B1** |
| 6(a)(ii) | reflected ray drawn with $i = r$ by eye | **B1** |
| 6(a)(iii) | angle of incidence = angle of reflection | **B1** |
| 6(a)(iv) | Mark is for the explanation linked to candidate's diagram.<br>e.g. if answer is YES they should state that the reflected ray hits/reaches the (other)driver/car or can be seen | **B1** |
| 6(b)(i) | ray refracted toward the normal | **B1** |
| 6(b)(ii) | angle of incidence labelled | **B1** |
| | angle of refraction labelled | **B1** |
| | **Total:** | **7** |

| Question | Answer | Marks |
|---|---|---|
| 7(a)(i) | visible light | **B1** |
| | gamma rays | **B1** |
| 7(a)(ii) | wavelength | **B1** |
| | frequency | **B1** |
| 7(b) | (sound) is a longitudinal wave (radio waves are transverse)<br>(sound) needs a medium to be transmitted (but radio waves do not) | **B1** |
| 7(c) | any four from: only award 4 marks if valid procedure<br><br>(use tape measure) to measure distance of at least 100 m<br>blocks banged together<br>stopwatch started when blocks are SEEN to hit<br>stopwatch stopped when sound heard<br>time taken recorded/calculated<br>speed = distance ÷ time | **B4** |
| | **Total:** | **9** |

| Question | Answer | Marks |
|---|---|---|
| 8(a) | At least 2 curves drawn from one end of magnet to the other | **B1** |
| | pattern is symmetrical by eye above and below middle of magnet | **B1** |
| | Arrow from N to S | **B1** |
| 8(b) | any 2 from:<br><br>magnet/block/metal placed in coil<br>coil connected to d.c. supply<br>(d.c.) current in coil (for short time) | **B2** |
| 8(c) | tick in 4th box steel | **B1** |
| | **Total:** | **6** |

| Question | Answer | Marks |
|---|---|---|
| 9(a) | arrow drawn pointing from C to D | **B1** |
| | arrow on /near side CD pointing upwards | **B1** |
| 9(b) | any 2 from:<br><br>increase (size of) current<br>increase strength of magnet<br>increase number of turns in coil | **B2** |
| 9(c)(i) | electrons | **B1** |
| 9(c)(ii) | current is smaller | **B1** |
| | (as) resistance of coil/wire is greater | **B1** |
| | **Total:** | **7** |

| Question | Answer | Marks |
|---|---|---|
| 10(a) | in any order:<br><br>cells/battery (connected) incorrectly<br>voltmeter used instead of ammeter<br>thermistor symbol used instead of LDR symbol | **B3** |
| 10(b)(i) | resistance decreases as brightness increases | **B1** |
| 10(b)(ii) | (resistance at 60% full brightness) = 2000 (ohms) | **B1** |
| | resistance = voltage ÷ current in any form e.g. $I = \frac{V}{R}$ | **C1** |
| | 8.0 ÷ 2000 | **C1** |
| | $4 \times 10^{-3}$ (A) | **A1** |
| | **Total:** | **8** |

| Question | Answer | Marks |
|---|---|---|
| 11(a) | protects circuit<br><br>if current too large | **B2** |
| 11(b)(i) | copper | **B1** |
| 11(b)(ii) | $\frac{N_S}{N_P} = \frac{V_S}{V_P}$ in any form | **C1** |
| | $\frac{16}{224} = \frac{N_S}{308}$ or $\frac{224}{16} = \frac{308}{N_S}$ | **C1** |
| | 22 (turns) | **A1** |
| | **Total:** | **6** |

| Question | Answer | Marks |
|---|---|---|
| 12(a) | proton | **B1** |
| | positive or +1 | **B1** |
| 12(a)(ii) | tick in third box | **B1** |
| 12(b) | idea of mass being halved, e.g. 0.5 | **C1** |
| | 0.25 (mg) | **A1** |
| | **Total:** | **5** |