



# Cambridge IGCSE<sup>®</sup>

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**PHYSICS**

**0625/03**

Paper 3 Theory (Core)

**For examination from 2020**

MARK SCHEME

Maximum Mark: 80

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**Specimen**

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This document consists of **6** printed pages.

## mark scheme abbreviations

|                    |   |
|--------------------|---|
| ( )                | the word, phrase or unit in brackets is not required but is in the mark scheme for clarification  |
| accept             | accept the response   |
| AND                | both responses are necessary for the mark to be allowed   |
| c.a.o.             | correct answer only   |
| e.c.f.             | error carried forward; marks are awarded if a candidate has carried an incorrect value forward from earlier working, provided the subsequent working is correct |
| ignore             | this response is to be disregarded and does not negate an otherwise correct response  |
| NOT                | do not allow  |
| note:              | additional marking guidance   |
| / OR               | alternative responses for the same marking point  |
| owtte              | or words to that effect   |
| <u>underline</u>   | mark is not allowed unless the underlined word or idea is used by candidate   |
| units              | there is a maximum of one unit penalty per question unless otherwise indicated  |
| any [number] from: | accept the [number] of valid responses  |
| max                | indicates the maximum number of marks   |

- 1 (a) (i) 15 (m/s) [1]  
(ii) 0 (m/s) [1]
- (b) constant OR nothing [1]
- (c) area of triangle OR area under graph OR appropriate equation of motion [1]  
 $\frac{1}{2} \times 30 \times 5$  [1]  
75 (m) [1]
- (d) speed = distance/time in any form, letters, words, numbers [1]  
750/30 [1]  
25 (m/s) [1]
- 2 (a) 1500 (N) [1]
- (b) second box ticked [1]
- (c) slows down / speed decreases / decelerates [1]  
resultant force in direction opposing motion / resultant is  $-500\text{ N}$  /  $500\text{ N}$  backwards [1]
- (d) any one from:  
increased wind / air resistance OR headwind )  
rough(er) ground OR flat tyre OR increased road resistance/friction ) [max 1]  
brakes applied )
- ignore increased speed / changed car shape / increased load  
ignore driver decided to stop
- 3 (a) (i) plumb-line (name or description) OR set-square and (horiz.) bench OR spirit level [1]  
(ii) line joining A and D AND line joining B and E [1]  
intersection clearly labelled G [1]
- (b) use of  $W = m g$  in any form, letters, words, numbers [1]  
evidence of conversion of g to kg (can be given from final answer) [1]  
1.2 (N) [1]  
(note: 1200 gains 2 marks)

- 4 (a) turning effect OR force  $\times$  distance (from fulcrum) [1]
- (b) (i) A AND idea of bigger distance from hinge / pivot [1]
- (ii) the door closes [1]
- 5 (a) (molecules) close together / touching / strong forces holding molecules together [1]  
(molecules) vibrate / are not free to move around [1]
- (b) temperature (of wax) increases (as time increases) [1]  
between 4 and 8 minutes the temperature stays the same [1]  
because the wax is melting (between 4 and 8 minutes) [1]  
temperature increases again / after 8 minutes [1]  
wax has all melted / is all liquid (after 8 minutes) [1]
- 6 (a) less pollution / reduced carbon (dioxide) emissions (compared to fossil fuels) OR other environmental reason [1]
- (b) any three from:  
output expected from wind turbine  
energy use by factory  
wind is intermittent  
whether location has suitable amount of wind  
cost / time to recoup cost of turbine  
whether location / noise will cause nuisance to neighbours [max 3]
- valid discussion of at least one factor from list above, linking it to the decision [1]
- 7 (a) increase in kinetic energy due to motion [1]  
increase in gravitational potential energy [1]  
due to increase in height [1]  
increase in strain / elastic energy of pole because it is bent [1]
- (b) total energy remains constant (note: can be implied by second mark) [1]  
gravitational potential energy lost = kinetic energy gained (+ thermal energy / heating) [1]
- 8 (a) beard tip to cross perpendicular to mirror [1]  
distance beard tip to mirror = distance mirror to cross B [1]
- (b) incident ray from beard tip to mirror and reflected ray along line from eye to cross B or angles of incidence and reflection are approximately the same [1]  
arrows from beard to eye [1]
- (c) angles  $i$  and  $r$  correctly labelled [1]

- 9 (a) radio OR television [1]  
ultraviolet [1]
- (b) “long wavelength” written at left end of spectrum [1]
- (c) cooking / ovens / grills / heating / remote-controls / burglar alarms [1]  
cancer treatment / medical imaging / sterilisation / use as a tracer [1]
- 10 (a) (i) 150 + 200 or 350 ( $\Omega$ ) seen or implied by correct final answer [1]  
use of  $I = V/R$  in any form or 12/candidate’s resistance seen or 12/350 implied by correct answer [1]  
0.034 to at least 2 sig. figs. [1]  
A or mA as appropriate [1]
- (ii) candidate’s (i)  $\times$  200 or proportion or potential divider calculation [1]  
6.9 (V) to at least 2 sig. figs. [1]
- (iii) variable resistor symbol drawn in suitable position on circuit [1]
- (b) (i) parallel [1]
- (ii) brighter [1]  
p.d. / voltage (across lamp) is greater [1]
- 11 (a) (i) at least two continuous loops either side of magnet, from one pole to the other [1]  
at least one arrow, not contradicted, showing direction N to S [1]
- (ii) magnet which operates when there is a current OR coil wrapped round iron bar [1]
- (b) (i) alternating current changes direction OR direct current is in one direction only [1]
- (ii) mention of magnetic field [1]  
changing magnetic field / flux linkage, however expressed OR field lines being cut etc. [1]  
induced emf / current / electricity [1]
- 12 (a) break up of unstable nuclei [1]  
emission of ionising radiation / alpha / beta / gamma [1]
- (b) only half-life ticked [1]
- (c) (i) clear statement of start point (can be inferred from markings on graph) [1]  
clear halving [1]  
2 minutes [1]
- (ii) 550/2 OR 1100/4 OR 2200/8 e.c.f. (c) (i) [1]  
275 (counts / min) e.c.f. (c) (i) [1]

- (d) (i) any two from:  
emissions (from radioactive substances) are ionising  
(ionising) radiation can damage cells / body tissue / burns  
risk of cancer  
risk of radiation sickness  
risk of mutations / damage to offspring [max 2]
- (ii) any two different examples from:  
use of gloves  
tweezers  
lead / concrete  
maintain distance  
minimise exposure time [max 2]