Cambridge Assessment International Education

Cambridge IGCSE®

PHYSICS **0625/03**

Paper 3 Theory (Core) **For examination from 2020**

MARK SCHEME

Maximum Mark: 80

Specimen

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
underline	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]
½ × 30 × 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 N / 500 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 × 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 (Ω) 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)** × 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]