CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0625 PHYSICS

0625/22   Paper 2 (Core Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

NOTES ABOUT MARK SCHEME SYMBOLS & OTHER MATTERS

B marks   are independent marks, which do not depend on any other marks. For a B mark to be scored, the point to which it refers must actually be seen in the candidate's answer.

M marks   are method marks upon which accuracy marks (A marks) later depend. For an M mark to be scored, the point to which it refers **must** be seen in a candidate's answer. If a candidate fails to score a particular M mark, then none of the dependent A marks can be scored.

C marks   are compensatory method marks which can be scored even if the points to which they refer are not written down by the candidate, provided subsequent working gives evidence that they must have known it, e.g. if an equation carries a C mark and the candidate does not write down the actual equation but does correct working which shows he knew the equation, then the C mark is scored.

A marks   are accuracy or answer marks which either depend on an M mark, or which are one of the ways which allow a C mark to be scored.

c.a.o.   means "correct answer only".

e.c.f.   means "error carried forward". This indicates that if a candidate has made an earlier mistake and has carried his incorrect value forward to subsequent stages of working, he may be given marks indicated by e.c.f. provided his subsequent working is correct, bearing in mind his earlier mistake. This prevents a candidate being penalised more than once for a particular mistake, but **only** applies to marks annotated "e.c.f."

e.e.o.o.   means "each error or omission".

Brackets ( ) around words or units in the mark scheme are intended to indicate wording used to clarify the mark scheme, but the marks do not depend on seeing the words or units in brackets, e.g. 10 (J) means that the mark is scored for 10, regardless of the unit given.

Underlining indicates that this must be seen in the answer offered, or something very similar.

OR/or   indicates alternative answers, any one of which is satisfactory for scoring the marks.

Spelling   Be generous about spelling and use of English. If an answer can be understood to mean what we want, give credit.

Significant figures
           Answers are acceptable to any number of significant figures ≥ 2, except if specified otherwise, or if only 1 sig. fig. is appropriate.

Units   Incorrect units are not penalised, except where specified. More commonly, marks are allocated for specific units.

Fractions These are only acceptable where specified.

Extras   Ignore extras in answers if they are irrelevant; if they contradict an otherwise correct response or are forbidden by mark scheme, use right + wrong = 0.

Ignore   indicates that something which is not correct is disregarded and does not cause a right plus wrong penalty.

Not/NOT   indicates that an incorrect answer is not to be disregarded, but cancels another otherwise correct alternative offered by the candidate, i.e. right plus wrong penalty applies.

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0625	22

1 **(a)** area under graph OR ½$(u + v)$ t C1

      ½ × 40 × 8   C1

      160 (m)   A1

    (b) 315 + candidate's **(a)**   C1

      distance = speed × time   **OR**   distance / time in words, symbols or numbers   C1

      (315 + 160) / 80   **OR**   (315 + candidate's **(a)**) / 80   C1

      (5.9) 38(m/s)   A1

    (c) **(i)** steady / same / constant / uniform speed   B1

      (ii) slowing down / decelerating / negative acceleration   B1

                                                                    [Total: 9]

2 **(a)** measuring cylinder / graduated cylinder   B1

    (b) balance, accept spring balance, accept (weighing) scales   B1

    (c) find mass of empty cylinder   B1

      find mass of cylinder + liquid   B1

      subtract values **NOT** if stated the wrong way round   B1
      accept valid alternative methods

    (d) density = mass / volume, in words, symbols or numbers   C1

      62.4 ÷ 80   C1

      0.78 **OR** 780   A1

      g / cm^3 **OR** kg / m^3 as appropriate   B1

                                                                    [Total: 9]

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0625	22

3 (a) equal (size / magnitude) / the same (size), ignore opposite   B1
NOT same direction

(b) it would (start to) sink (if weight>upthrust)   B1

(c) moves (forward)   C1

accelerates forward / increases speed / moves faster   A1

(d) slows down, IGNORE stops (moving)   B1

[Total: 5]

4 (a) idea of expansion / gets bigger   B1

(b) particles have more energy / vibrate faster   B1
ignore move quickly or move faster

particles move apart / space between particles increases   B1
NOT particles expand

(c) contracts / gets smaller / shrinks   B1
IGNORE fits tightly

(d) idea of being pushed together   B1
accept move / stick together / compressed
accept pulled tight/together

[Total: 5]

5 (a) (i) wax melts (faster) on copper rod   B1

wax melts less (far) / not at all / slower on plastic rod   B1
comparison needed

(ii) IGNORE any statements about <u>conduction of electricity</u>
copper is a (good) (thermal) <u>conductor</u>   B1

plastic is an <u>insulator</u> / poor <u>conductor</u>   B1

(b) (only) faster / high (k.)e. / most energetic particles   B1

escape / go into the air or leave the water (surface)   B1

(this means) average (k.) e. of water decreases/falls   B1
accept internal energy / thermal energy for k.e.

[Total: 7]

Page 5	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0625	22

6 (a) speed = distance / time in words, symbols or numbers **OR** distance / speed   C1

330 / 5000   C1

0.066 (s), allow 0.07 (s) (to one significant figure)   A1

(b) man with hammer hears one sound
accept hears the sound almost instantly / first   B1

other man hears two sounds **OR** 1 through air and 1 through rail   B1
NOT hears two sounds, one is an echo

any one from:
hears sound through rail before sound through air
calculation of time difference between sounds
because (speed of sound) in metal/steel faster than (speed of) sound in air   B1

[Total: 6]

7 (a) (i) correct idea ± 1 line   C1

correct distance   A1

(ii) (slinky spring) moved backwards and forwards owtte   B1

(b) (i) correct idea e.g. crest to crest **NOT** just 2 peaks marked   C1

(ii) idea of bigger (vertical) distance between crest and trough   B1

(c) (i) no change / nothing   B1

(ii) less / shorter / smaller / decreases   B1

[Total: 7]

8 (a) (i) any one from: aluminium, copper, gold, iron   B1

(ii) any one from: ebonite, glass, plastic, silk   B1

(iii) iron   B1

(iv) any one from: ebonite, glass, plastic, silk   B1

Page 6	Mark Scheme	Syllabus	Paper
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(b)   accept correct alternative methods

stroke with <u>pole</u> of magnet   B1

in one direction   B1

OR (alternative answer)
place in solenoid / coil   (B1)

current in one direction / battery / d.c.   (B1)

[Total: 6]

9   **(a)**   **(i)**   ammeter **NOT** ampmeter
accept multimeter <u>on current range</u>   B1

(ii) 2nd box ticked, current   B1

(b)   **(i)** 1st box ticked, charge   B1

(ii)   **1.** $(R =) R_1 + R_2$ in words, symbols or numbers   C1

24 (Ω)   A1

2. $V = IR$ in any form **OR** V/R C1

12 / 24 e.c.f.   C1

0.5 e.c.f.   A1

A **OR** amp(s) **OR** ampere(s)   B1

(c)   bottom box ticked, 0 V   B1

[Total: 10]

10   **(a)**   lamp will blow / burn out
accept blow up / glow too / very brightly ignore bright / won't work   B1

(b)   **(i)**   transformer shown with one coil across input and other coil across output
accept any reasonable attempt at transformer symbol   B1

(ii)   factor of 2 e.g. 12 / 6, 6 / 12 or 2:1 ignore units   C1

1:2 **OR** 1 to 2   A1

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Page 7	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2014	0625	22

(c) (i) resistor shown joining top two wires or bottom two wires M1
accept diagonal connection

complete series circuit A1
note: 2 resistors in series gains only one mark B1

(ii) 1.5 (Ω) B1

[Total: 7]

11 (a) 23 B1

(b) 11 B1

(c) 12 B1

(d) 11 no e.c.f. from **(b)** B1

[Total: 4]

12 (a) 4 (hours) B1

appropriate indication of method (minimum indication any halving of count rate on axis
or curve) B1

(b) (i) 1000 B1

(ii) candidate's **(a)** B1

(iii) in the range 62 – 63, e.c.f. from **(b) (i)** and **(b)(ii)** B1

[Total: 5]