Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICS **0625/32**

Paper 3 Core Theory **May/June 2018**

MARK SCHEME

Maximum Mark: 80

Published

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 International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

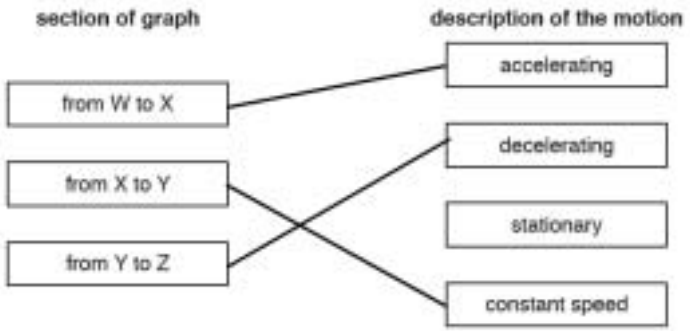
GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks
1(a)	 1 mark for each correct line. 2 or more lines from any section loses the mark.	**3**
1(b)	(distance travelled) = area under graph OR ½ × base × height	**1**
	½ × 40 × 20	**1**
	400 (m)	**1**
1(c)	1st section/WX/from 0 s to 30 s has greater gradient than last (section)/YZ/from 60 s to 100 s	**1**

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Question	Answer	Marks
2(a)	(W =) m × g	**1**
	650 × 8	**1**
	5200 (N)	**1**
2(b)(i)	(volume of log =) 3 × 0.04 = 0.12 (m^3)	**1**
	D = M / V OR (D =) M / V	**1**
	550 (kg / m^3)	**1**
2(b)(ii)	The density of logs is less than density of water owtte.	**1**

Question	Answer	Marks
3(a)(i)	(moment =) force × distance	**1**
	150 × 0.5	**1**
	75	**1**
	N m	**1**
3(a)(ii)	accept any example involving turning forces	**1**
3(b)	increase distance (of force from pivot point)	**1**

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Question	Answer	Marks
4(a)(i)	38 (°C)	**1**
4(a)(ii)	2nd box ticked i.e. expansion of liquid	**1**
4(b)	conduction	**1**
4(c)	any **three** from: water is a fluid water molecules gain (kinetic) energy/move faster/further apart water expands/volume increases warm/hot water or molecules rises convection (current created) cooler/cold/water falls/sinks (to be heated again)	**3**
	correct reference to density change of water	**1**

Question	Answer	Marks
5(a)	(focal length =) 5 (cm)	**1**
5(b)(i)	straight line through F and then parallel to PA from centre of lens	**1**
5(b)(ii)	straight line from top of object through centre of lens	**1**
5(b)(iii)	image indicated at point where rays cross	**1**
	arrow drawn inverted on RHS of lens	**1**

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Question	Answer	Marks
6(a)	(thermal energy is used) to produce steam	**1**
	steam turns a turbine	**1**
	(turbine) turns a generator	**1**
6(b)	any **two** from: radioactive material/waste produced problems storing waste long half-life of waste/fission products (accidental) leak of nuclear/radioactive material	**2**

Question	Answer	Marks
7(a)(i)	microwaves	**1**
7(a)(ii)	3.0×10^8 (m / s)	**1**
7(a)(iii)	ultraviolet or X-rays or gamma/γ-rays	**1**
7(b)(i)	X-rays any one from: detecting broken bones/damaged teeth or detecting/treating cancer	**1**
	gamma: any one from: detecting/treating cancer or sterilising (hospital) equipment/food	**1**
7(b)(ii)	any **two** from: ionising radiations/high frequency/high energy (e-m radiation) (may) damage or mutate cells/DNA (may) cause radiation burns	**2**

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Question	Answer	Marks
8(a)(i)	vibrates	**1**
8(a)(ii)	longitudinal	**1**
8(a)(iii)	vacuum	**1**
8(b)(i)	1000 (Hz)	**1**
8(b)(ii)	frequency in range 10 001 to 30 000 (Hz)	**1**
8(b)(iii)	lowest frequency heard by humans is 20 Hz	**1**
	(but) elephants can hear frequencies below 20 Hz	**1**
8(b)(iv)	ultrasound	**1**

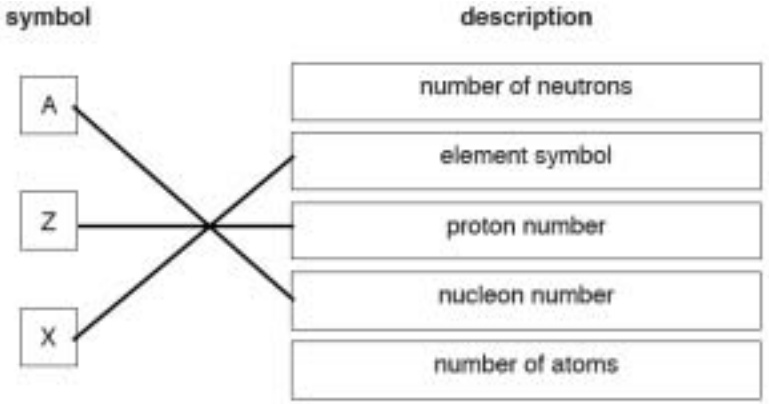
Question	Answer	Marks
9(a)(i)	top box (electrons) ticked	**1**
9(a)(ii)	12 + 6 seen or 18 (Ω)	**1**
9(a)(iii)	(V =) I × R	**1**
	(V =) 0.50 × 18(.0)	**1**
	(V =) 9.0 (V) ecf from **(a)(ii)**	**1**
9(b)	(reading/current) increases	**1**
	(because effective circuit) resistance decreases/resistors in parallel have less resistance	**1**

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Question	Answer	Marks
10(a)(i)	second box (The balloon loses electrons) ticked	**1**
10(a)(ii)	positive (charge)	**1**
	like charge(s) repel	**1**
10(b)	circle around copper **AND** silver	**1**

Question	Answer	Marks
11(a)(i)	(Q is the) secondary/output (coil)	**1**
11(a)(ii)	1. (soft–) iron	**1**
	2. core	**1**
11(a)(iii)	magnetic field **OR** e.m.f. **OR** magnet	**1**
	changing **OR** alternating	**1**
11(a)(iv)	EITHER more …**AND** step-down **OR** fewer …**AND** step-up	**1**
11(b)	any **two** from: smaller current (in wires) smaller drop in p.d./voltage (across cables) smaller heating effect less energy wasted/more efficient thinner cables can be used fewer pylons neededl (electricity) can be transmitted over long(er) distances	**2**

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Question	Answer	Marks
12(a)	 1 mark for each correct line. 2 or more lines from any section loses the mark.	**3**
12(b)(i)	18 / 6 or 3 half lives seen or implied	**1**
	1 / 8 or division by 8	**1**
	1.5 (mg)	**1**
12(b)(ii)	any **two** from: high energy/fast-moving electron/negatively charged particle about 2000 times smaller than a proton/neutron	**2**
12(b)(iii)	any **one** from: new element formed neutron becomes/turns into a proton Z/proton number increases by one neutron number decreases by one	**1**

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