OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE PHYSICS

9203/1

PAPER 1
Mark scheme

Specimen material

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

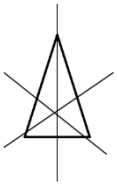
Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Question 1

Question	Answers	Extra information	Mark
01.1	terminal velocity		1
01.2	10 000 m		1
01.3	784 = mass x 9.8 80 (kg)	 allow 80 (kg) with no working shown for **2** marks	1 1
01.4	(acceleration) decreases		1
01.5	air resistance increases therefore resultant force decreases		1 1
01.6	0 m/s air resistance = weight so resultant force is now zero		1 1 1
Total			**10**

Question 2

Question	Answers	Extra information	Mark
02.1	a point representing the mean position of the matter in an object		1
02.2			1
02.3	force		1
02.4	M = 560 x 1.7 950 (Nm)	 allow 950 (Nm) with no working shown for **2** marks	1 1
02.5	clockwise child A's moment is greater than child B's moment	allow child A goes down and child B goes up	1 1
02.6	560 x Distance = 420 x 2.4 Distance = (420 x 2.4) / 560 Distance = 1.8 m	 allow 1.8 m with no working shown for **3** marks	1 1 1
Total			**10**

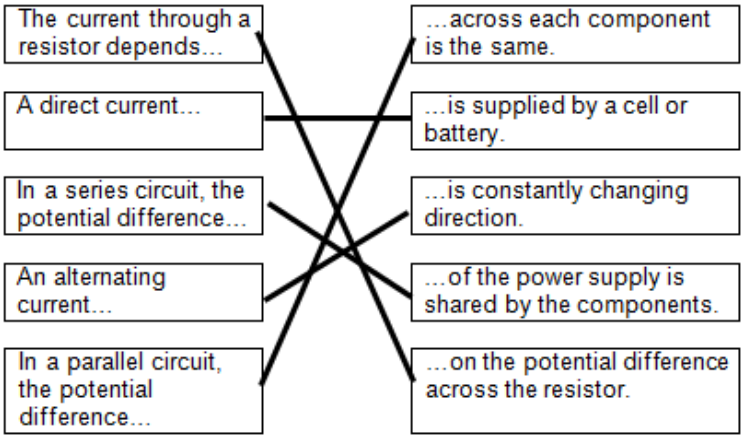
Question 3

Question	Answers	Extra information	Mark
03.1	short sight		1
03.2	the lens is unable to focus the rays onto the retina		1
03.3	diverging		1
03.4	laser		1
03.5	virtual upright magnified		1 1 1
03.6	3.6 ÷ 1.2 **or** 3.7 ÷ 1.2 **or** 36 ÷ 12 **or** 37 ÷ 12 **or** 18 ÷ 6 **or** 18.5 ÷ 6 **or** 10.2 ÷ 3.4 **or** 102 ÷ 34M answer in the range 3.0 ↔ 3.1 inclusive		1 1
03.7	principle focus	do **not** accept focal length	1
Total			**10**

Question 4

Question	Answers	Extra information	Mark
04.1	B's frequency is greater B's wavelength is shorter B's amplitude is higher	allow converse correctly stated for A throughout	1 1 1
04.2	any **four** from: radio waves • transverse • travel at speed of light • have greater frequencies • can travel through a vacuum. sound waves • longitudinal • slower than electromagnetic waves • need particles to travel through.		4
04.3	doppler		1
04.4	as the car moves towards the observer the frequency of the sound is increased as the car moves away the observer the frequency of the sound is decreases		1 1
Total			**10**

Question 5

Question	Answers	Extra information	Mark
05.1	 all 4 correct for **3** marks 2 or 3 correct for **2** marks 1 correct for **1** mark		3
05.2	(rate of) flow of (electric) charge/electrons	allow I = Q/t with Q and t correctly named	1
05.3	increasing the potential difference increases the current in the metal filament this increases the number of collisions between the charges and the atoms/ion in the wire this causes the ions to vibrate more, increasing the temperature of the metal filament		1 1 1
05.4	diode		1
05.5	R = 0.8 / 0.05 16 (Ω)	 allow 15 if using 0.052 allow 16 (Ω) with no working shown for **2** marks	1 1
Total			**10**

Question 6

Question	Answers	Extra information	Mark
06.1	any **two** from: • (some) current flows to Earth • current flows through copper braid • RCCB detects difference between current in live and neutral wire.	 allow ground for Earth allow current flows through the earth wire accept electricity for current in either the first or second marking point but not both	2
06.2	can be reset **or** faster acting	allow does not need replacing allow switches circuit off faster	1
06.3	$11 = \frac{Q}{2 \times 3600}$ 79 000 coulombs/C	 allow 79 000 with no working shown for the **2** calculation marks 	1 1 1
06.4	230 x 79000 18 170 000 (J)	 allow 18 170 kJ **or** 18.17 MJ allow 18 170 000 (J) **or** 18 180 kJ **or** 18.17 MJ with no working shown for **2** marks	1 1
06.5	increases temperature of thermistor changes resistance (of thermistor)	 do not accept increases resistance (of thermistor) allow decreases resistance (of thermistor)	1 1
Total			**10**

Question 7

Question	Answers	Extra information	Mark
07.1	nuclear reactor star		1 1
07.2	nuclei are joined (not split)	allow converse for nuclear fission do **not** accept atoms are joined	1
07.3	any **four** from: • neutron • (neutron) absorbed by U (nucleus) • forms a larger nucleus • (this larger nucleus is) unstable • (larger nucleus) splits into two (smaller) nuclei / into Ba and Kr • releasing **three** neutrons and energy.	 ignore atom do **not** accept reacts do **not** accept added to allow fast-moving for energy	4
07.4	56 (Ba) 57 (La) $^{0}_{-1}\beta$	 if proton number of Ba is incorrect, allow this mark if proton number of La is 1 greater allow e for β allow $^{139}_{56}Ba \longrightarrow {}^{139}_{57}La + {}^{0}_{-1}\beta$ for **3** marks	1 1 1
Total			**10**

Question 8

Question	Answers	Extra information	Mark
08.1	provided more evidence to support the 'Big Bang' theory		1
08.2	mass of hydrogen = 1/1000 = 0.001 kg loss in mass = 0.001 x (0.7/100) = 7×10^{-6} kg energy released = $7 \times 10^{-6} \times (3 \times 10^{8})^{2}$ energy released = 6.3×10^{11} (J)	allow 6.3×10^{11} (J) with no working shown for **4** marks	1 1 1 1
08.3	any **two** from: • greater mass means greater **core** temperature/ pressure • greater core temperature/ pressure means greater rate of fusion • increase in mass produces a proportionally much greater increase in the rate of fusion.		2
08.4	temperature decreases **or** (relative) luminosity increases as it changes to a red giant temperature increases **or** (relative) luminosity increases as it changes to a white dwarf correct change in temperature and (relative) luminosity as Sun changes to a red giant and then to a white dwarf	if both temperature and luminosity are given, both must be correct if both temperature and luminosity are given, both must be correct allow changes to a red giant and then to a white dwarf with no or incorrect reference to temperature and/or luminosity for **1** mark if no other marks awarded	1 1 1
Total			**10**

Question 9

Question	Answers	Extra information	Mark
09.1	3		1
09.2	30 000		1
09.3	frequency is 30 000 Hz range of human hearing is 20 Hz to 20 000 Hz 30 000 Hz > 20 000 Hz		1 1 1
09.4	ultrasound/waves are reflected Pulse A indicates/is the crack Pulse B indicates/is the back (of the block or crack)		1 1
09.5	time = 0.000005 x 5 = 2.5×10^{-5} s Distance = 6 000 x 2.5 x 10^{-5} s Distance = 0.15 (m)		1 1 1
Total			**10**