



Rewarding Learning

**General Certificate of Secondary Education
2016–2017**

Science: Single Award

Unit 3 (Physics)

Foundation Tier

[GSS31]

WEDNESDAY 24 MAY 2017, AFTERNOON

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

			AVAILABLE MARKS	
1	(a)	A Mercury [1] C Earth [1]	[2]	5
	(b)	D Mars	[1]	
	(c)	Asteroid, moon, planet, star any 2 in right order [1] all in right order [2]	[2]	
2	(a)	Correct symbols [1] ammeter in series + voltmeter in parallel [1]	[2]	5
	(b)	6/2 [1] 3 [2]	[2]	
	(c)	Ohm	[1]	
3	(a)	24 [1] 53 [1]	[2]	5
	(b)	(i) Friction	[1]	
	(ii) Heat	[1]		
(c)	(The lower the speed limit) the lower the percentage killed	[1]		
4	(a)	(i) B	[1]	12
	(ii) A	[1]		
	(b)	(i) Three bars correct [1] all bars correct [2]	[2]	
	(ii) Aluminium	[1]		
	(c)	The deeper the water the faster the speed of the wave	[1]	
	(d)	(i) X-ray; visible; infrared one correct [1] all 3 correct [2]	[2]	
	(ii)	All travel at the speed of light/all carry energy/all travel in a vacuum	[1]	
	(iii)	Wavelength/frequency	[1]	
(e)	Any two from: wider range of hearing for teenagers as frequency increases, pensioners number decreases as frequency increases, no effect for teenagers no-one can hear above 20 kHz	[2]		

			AVAILABLE MARKS	
5	(a)	Cornea [1] retina [1]	[2]	4
	(b)	Convex/converging	[1]	
	(c)	Lighter	[1]	
6	(a)	310	[1]	3
	(b)	$310 \times 20 = 6200$ [1]	[2]	
		£62 [1]		
7	(a)	(i) 11	[1]	11
		(ii) To improve reliability	[1]	
		(iii) Alpha [1] count rate dropped with paper as a barrier [1]	[2]	
		(iv) Value between 10 and 11	[1]	
	(b)	(i) The time [1] it takes for the radioactive count to fall by a half [1]	[2]	
		(ii) 5.2–5.4 years	[1]	
	(c)	(i) To stop the gamma rays escaping [1] to prevent damage to human cells [1]	[2]	
		(ii) Radiotherapy	[1]	
	8	(a)	Renewable energy is a form of energy which will not run out	
(b)		Magnet + coil [1] relative movement [1]	[2]	
		(c)	The greater the diameter of the blade, the more power is produced [1] the greater the wind speed , the more power is produced [1]	[2]
(d)		No significant noise increase	[1]	

9 (a) Indicative content:

- clouds dust/gas nebula
- made of hydrogen
- pulled together/attracted
- by gravity
- **nuclear fusion** takes place
- helium formed
- heat and light **produced**/made

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe fully, in a logical sequence, how a star is formed (using at least six of the above points). They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to partially describe, in a logical sequence, how a star is formed (using four or five of the above points). They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe how a star is formed (using one to three of the above points). However these are not in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

(b) (i) Geocentric [1]

(ii) Any **two** from:

sun at the centre of Solar System

modern has more planets

planets in a different order

planet orbits elliptical

} must be clear which model

[2]

Total

9

60