

GCSE

Edexcel GCSE

Astronomy (1627)

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Examiners' Report

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1627/01

Overall impressions

This year's examination paper included a wide range of questions of varying difficulty that gave candidates the opportunity to display their knowledge and understanding of Astronomy. There were also many questions in which candidates were asked to apply their skills in novel situations. It was felt that candidates responded well to the different styles of questioning, although there was some concern that some found the more open-ended questions difficult. In particular, many responses to tasks involving drawing labelled diagrams were disappointing.

It is worth mentioning here that the marks awarded for each part of the question should act as a guide to the level of detail required in an answer. As a general rule, one mark is awarded for one relevant point.

In contrast, responses to the more 'standard' type of question were generally very pleasing.

The overall standard of English is still causing the examiners some concern, particularly in those questions in which the Quality of Written Communication is clearly being taken into account. There is a large amount of evidence that poorly written answers often mask the true meaning of an answer and that, although the examiners attempt to decipher many responses, it is often difficult to award full marks. This is particularly evident in those questions which ask candidates to *explain* effects such as why the sky is blue.

Candidates should also be aware that writing vague answers containing a long list of facts in the hope that some might be relevant to the question (for example question 2 which asked for a brief description of Miranda's surface) is unlikely to score full marks since many facts often contradict each other.

Paper 01

Question 1

The opening questions posed no difficulties, with most candidates scoring full marks. In (b), some questions stated that the Earth had an atmosphere without further clarification; this was not awarded a mark.

Question 2

Surprisingly few candidates were able to correctly outline the discovery of Uranus in (a). Responses to (d) were often too vague (for example *cratered and hilly*); many responses could equally have been relevant to any number of moons.

Question 3

This question requiring factual recall of sizes and distances was generally well answered.

Question 4

Responses to (a) and (b) were impressive. However in (c), many candidates failed to draw convincing diagrams of the Sun's corona during solar maximum.

Question 5

Most candidates were able to associate the given dates to the astronomical phenomena correctly.

Question 6

In (a), rilles were often confused with ridges. Part (b) on any other named lunar feature posed few problems.

Question 7

Responses to parts (a) and (b) were pleasing and most candidates appeared to perform the calculations without trouble. Explanations for the need for time zones in (c) were disappointing and many candidates failed to mention the Earth's rotation.

Question 8

Explanations of a number of phenomena tended to be vague, with important terms such as *scattering* and *refraction* omitted altogether. The number of candidates who related the Sun's colour to its temperature was disappointing.

Question 9

Most candidates found no problems manipulating stellar magnitude data and many scored full marks on this question.

Question 10

Vary few candidates gave the simple answer of strong gravitational fields associated with 'dead' stars in (a). There were too many who thought that black holes were actually holes or vacuums in space. Responses to (b) were more pleasing, with references to the emission of x-rays being popular.

Question 11

In (a), the vast majority of candidates could identify the crescent phase of the Moon but then failed to deduce that Venus would have the same phase. In (b), explanations as to why the Moon was setting were poor; many candidates failed to point out that the Sun was illuminating the Moon from the right of the image and therefore the Moon was being observed in the west. Most candidates explained the apparent position of the Moon being higher than expected in terms of refraction of light as it passes through the Earth's atmosphere but tended to draw poor or incorrect diagrams in (c).

Question 12

This question proved to be a good discriminator; most candidates were able to score some marks but the range in the amount of relevant detail given in answers was wide. In (b), too many incorrect responses related the Big Bang to the birth of our Solar System.

Question 13

The examiners were pleased with most responses to this question about the Earth's rotation, and most candidates scored high marks for the declination calculation in (b).

Question 14

This question was not answered well by many candidates, despite it being a popular topic (and examination question). Many candidates believed that the radio dish emitted radio waves and few pointed out the reflection of radio waves to an antenna or focus. In (b) the key word *resolution* was often omitted, and few candidates

could relate the relative sizes of the two telescopes to their areas, 38 being a common incorrect answer.

In (d), many discoveries were too vague e.g. 'clouds'.

Question 15

In contrast, this question about comets was answered well, with most candidates displaying a good knowledge about their orbits. Some failed to give sufficient detail on the nature of the Oort Cloud in (d), merely repeating the words given in the question, but generally the examiners were pleased with most responses.

Question 16

Diagrams to show the distribution of globular clusters were disappointing in (a), but many candidates could describe their physical nature well. In (c), very few candidates related clusters of 'young' stars such as the Pleiades to sites of star formation in the spiral arms of galaxies.

Question 17

This question was generally well answered and the examiners were pleased that the purposes of recent and current space missions is generally well known.

Question 18

There were some good attempts at explaining parallax in (a), but only a few candidates were able to score full marks in (b), indicating that applying the technique that was correctly drawn in (a) was difficult.

Question 19

Many candidates scored full marks in this open-ended question about tides. The examiners were very impressed with many of the diagrams and the correct association of spring and neap tides to the relative positions of the Earth, Sun and Moon.

Question 20

Many candidates stated Kepler's third law (and not the second) in (a). Calculations were generally performed accurately in (b) and the examiners were pleased with the number of correct answers to this difficult question.

Paper 02

As in previous years, a high standard of astronomical observations, graphical and constructional work was demonstrated by candidates for this increasingly popular qualification. This clearly illustrates the enjoyment of this aspect of GCSE Astronomy by students and their teachers alike.

The internal consistency of marking was high for the overwhelming majority of centres. This year, however, a small number of centres were very lenient in their marking, necessitating adjustments to maintain consistent standards across all centres. Centres are advised to read the clear guidance for the award of marks for this component in the Specification (pp.23-29) and to look through the samples of coursework marking available in the Coursework Guide. In addition, attendance at the annual GCSE Astronomy Examiners' Feedback INSET day is strongly recommended. Amongst other activities, it allows colleagues to view examples of coursework from the full range of attainment, along with a workshop focusing specifically on the accurate marking of coursework.

Details of the Specification, Coursework Guide and INSET for GCSE Astronomy can be found on the Edexcel website at www.edexcel.org.uk.

The attention of centres is drawn particularly to the strands within the Mark Scheme where marks are awarded for the visual impact and presentation of students work ('Presentation' and 'Information Displayed'). Centres are reminded that work which has been extremely well presented, resulting in visually striking portfolios of work should be marked highly under these strands alone. Centres should resist the temptation to allow the visual impact of portfolios to influence their marking in the other strands.

This year showed an upturn in the number of centres where the majority of candidates had chosen the same project titles from the range of suggestions available in the Specification (p.22-26). The Examiners would strongly urge centres to ensure that all their candidates are able to choose projects from the full range of suggested titles available.

Conversely, whilst the list of suggested project titles in the Specification provides a basis for excellent project work for the vast majority of candidates, a handful of students produce astronomical work for other original titles, which still fall within the headings of Observational, Graphical and Constructional work. In these cases, it is essential that Centres confirm the details of the proposed project title with Edexcel before candidates begin work. Unfortunately this year saw a few candidates who submitted work for project titles which did not fit the assessment criteria for GCSE Astronomy, making much of the students' hard work unsuitable for their final portfolio.

The administration of the moderation process was greatly enhanced by the overwhelming majority of centres who ensured that all necessary paperwork was accurately and punctually completed. Centres should regard the use of the Coursework Record sheet¹ for the marks of each candidate as essential and it should accompany each candidate's portfolio. This will avoid unnecessary errors in calculating candidates' final marks.

¹ Page 77 of the Specification.

Finally, the Examiners would like to thank the staff in the majority of centres who ensure that sampled coursework is well organised, clearly labelled and promptly despatched. The request that centres do not send items substantially larger than A4 in size is once again stressed. Large charts, sundials and telescopes should all be photographed and the pictures included to enhance the accompanying written report. Centres are advised that from next year, it will not be possible to return any such large items which are sent to the moderator.

Grade Boundaries

The subject is graded out of a maximum of 160 subject marks.

	A*	A	B	C	D	E	F	G
Mark/160	118	97	76	56	47	38	29	20

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