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Astronomy (1627)

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Summer 2005

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Examiners' Report

Edexcel GCSE
Astronomy (1627)

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Contents

Paper 01 Examiners' Report	1
Paper 02 (Coursework) Moderators' Report	5
Grade boundaries	6

Examiners' Report

General

It appeared that not all candidates had been taught the complete course, with questions on important topics such as stellar evolution and the H-R diagram being attempted by none of the candidates from some Centres. The examiners are very aware that many GCSE Astronomy courses are taught out of the mainstream school or college timetable, perhaps with unavoidable time restrictions, but do urge teachers to cover all topics in their teaching programmes in order to make all of the questions accessible to their students.

The overall standard of English is still causing some concern. Many candidates confused the words '*how*' and '*why*' when reading particular questions (notably questions 4(d), 14(a) and 15(d)), and a large number of written responses were often too vague to convey to the examiners true knowledge or understanding; this was particularly evident in question 10 that sought to distinguish between the various types of nebulae, with phrases such as 'big and gaseous' appearing too frequently.

Paper 01

Question 1
There were no difficulties answering this fairly straightforward question; the vast majority of candidates successfully matched the objects to their descriptions.

Question 2
In part (a) many candidates failed to score 3 marks. Part (b) on Galileo's discoveries was well-answered.

Question 3
This was another straightforward question; the majority of candidates gained 4 marks. However, a significant number of candidates placed the Hubble Space Telescope last in the list (i.e. beyond Pluto), and some did not fill in the dotted lines as intended.

Question 4
The approximate temperature of the photosphere seems not to have been known by many candidates, despite it being required in the Specification.

Many candidates apparently failed to notice the word 'structure' in (b) and simply drew sunspots on the disc of the Sun.

Part (c) elicited a range of responses from 4 min to 4.5 billion years, and many candidates confused the rotation period of the Sun with the solar cycle and therefore failed to score many marks in (d).

Question 5
This question was generally well-answered, with many candidates scoring full marks.

Question 6
Again, many candidates did very well in this question. Some, however, failed to show how the number of light years in one parsec was obtained (part (c)) and scored only 1 out of a possible 3 marks.

Question 7
There were a number of good responses to this question on transits. A significant number of candidates, however, seemed to lack knowledge of these, despite last year's well-publicised transit of Venus.

Question 8
Parts (a) and (b) were generally well-answered. Very few drew the gibbous Moon for (c) and many omitted the full disc of the Moon (or its 'full' phase) in (d), merely stating that it would look orange/coppery in colour. It is perhaps worth reminding candidates to look carefully at the number of marks awarded for part of a question; very rarely are 2 marks awarded for just one piece of information.

Question 9
There was a huge variation of drawings of the refracting telescope, with many opting to draw mirrors! The calculations in (b) and (c) generally posed no problems to the candidates.

Question 10
This question on nebulae was poorly answered; only a handful of candidates showed a true grasp of the various stages of evolution of stars.

Many responses were also too vague to convey a real sense of knowledge or understanding. Previous examiners' reports have drawn attention to the fact that this part of the specification often reveals weaknesses in this area of Astronomy.

Question 11
Part (a) on Pluto was well-answered by the majority of candidates. Responses to part (b) on the Kuiper Belt were less convincing and very few candidates conveyed knowledge of this part of the Solar System, offering vague or weak facts such as 'It was discovered by Kuiper'.

Question 12
Most candidates drew and labelled the H-R diagram well. A significant number, however, omitted this question completely!

Question 13
Some vague answers such as 'where the meteors come from' failed to score marks in (a), but most candidates could explain the yearly occurrence of meteor showers successfully and with good diagrams.

Some candidates still confuse meteoroids with meteorites (as do various parts of the media!) and it important that teachers stress the important difference.

Question 14
Part (a) was often misinterpreted, with many candidates concentrating on the nature of Venus' atmosphere as opposed to the radar technique.

Parts (b) and (c) were generally well-answered, although those candidates who merely stated that Neptune was far away, without any further clarification, only scored 1 out of 2 marks for (c).

Question 15
There were generally very few problems with the celestial co-ordinates. Despite this being the theme of the question, only a few candidates related the invisibility of planets to the high declination of Cepheus in (c).

Responses to (d) were generally disappointing and often not attempted.

Question 16
Quasars were often confused with pulsars in part (a). The examiners were pleased that majority of responses, however, were well-stated and clear.

Question 17
Drawings in part (a) were generally correct, and most candidates could use the inverse square law to determine the ratio of forces in (b).

Kepler's third law was often written simply as an equation (despite the word *State* in the question's stem) and sometimes candidates failed to score both marks for (c) by using 'is equal to' and not 'is proportional to'.

Question 18
Months were often guessed in (a), but most candidates gave convincing responses to part (b).

Question 19
There were a handful of good, clear diagrams in (a). Most candidates, however, failed to draw convincing diagrams and were unable to distinguish between, say, the various types of elliptical galaxy.

Responses to (c) tended to concentrate on the bending of light or spaceships disappearing into black holes! The differences between the known facts and the various fictions perhaps needs stressing to candidates.

Question 20
A difficult question, but many candidates scored 3 or 4 marks in (a).

Very few successfully used the inverse square law in (b): this was often left blank. It is important to point out to students that where no equation is given in a numerical question, then some degree of reasoning must be used to solve the problem.

Paper 02

A very pleasing standard of coursework was submitted this year, illustrating the sound grasp of astronomical principles and hard work of the candidates. As in previous years, some candidates produced outstanding pieces of coursework, showing a real enthusiasm for the subject.

The internal consistency of coursework marking was also very high this year, resulting in only a very small number of changes to centre marks to maintain consistency across centres.

This year, a number of students made very effective use of observations produced with the aid of one of the robotic telescopes currently accessible via the Internet. These clearly represent a substantial step forward in the astronomical objects which can now be studied by the GCSE Astronomer. Similarly, some excellent work was submitted by candidates with access to amateur telescopes, particularly when this was combined with digital imaging. These advances allow access to levels of observation which, even comparatively recently, would have been available only to professional astronomers. In both these cases, the Examiners would stress to centres the importance of ensuring that all observations are entirely the work of the individual candidate themselves.

This year showed a slight 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.

The administration of the moderation process was greatly enhanced by the overwhelming majority of centres who ensure that all necessary paperwork is accurately completed and included in the prompt despatch of the coursework sample. The Examiners would like to thank the staff in these centres for their hard work and attention to detail. Indeed, the only remaining concern is the tiny handful of centres who continue to send items of coursework which are significantly larger than A4 in size. Once again, these centres are reminded that items such as sundials, telescopes and charts larger than A4 should be photographed, rather than posted to the moderator. The resulting photograph may be used by the candidate to enhance the presentation of their project or may simply be attached to the project report.

Grade Boundaries

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

	A*	A	B	C	D	E	F	G
Mark/160	120	101	82	64	52	41	30	19

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