

# Principal Examiner Feedback Summer 2010

GCSE

GCSE Astronomy (1627/01)

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## 1627/01 Astronomy Examiners' Report

### Overall impressions

The examiners felt that the vast majority of questions were accessible to candidates of all abilities and were pleased that only a handful of items in did not receive the calibre of response that they had hoped for.

Several questions proved good discriminators. In particular, the mathematical questions, testing reasoning rather than simply the use of a formula (for example items 13(d) on planetary distances, 14(c) on the diameters of telescope mirrors and 15(b) on commentary orbits), attracted the full range of marks.

The mean mark was slightly lower this year, and it was very evident that many candidates lost a significant number of marks by their inability to express themselves in a convincing manner, possibly through a lack of general understanding of astronomical topics. Although the specification is laid out clearly and lists specific criteria on which candidates could be examined, there does appear to be a lack of general astronomical awareness by many candidates who found it difficult to assimilate knowledge and understanding from different areas of the specification. This was particularly evident in Question 3 in which candidates were asked to link different electromagnetic radiations with a variety of astronomical scenarios. With the new specification's emphasis on observation and practical Astronomy, the examiners hope that teachers will address this and encourage their students to delve more deeply into the topics being studied.

The examiners were disappointed with the generally poor spelling, grammar and disregard for the quality of written communication: for example, a lack of appreciation of proper nouns by many candidates who wrote sun, earth and july as opposed to Sun, Earth and July, was very common, and many poorly-constructed sentences responding to open-ended questions suggested guesswork and a lack of real understanding.

### Question 1

All parts of this question on constellations were answered correctly by the vast majority of candidates.

### Question 2

Similarly, most candidates found no difficulty with all parts of this question.

### Question 3

Responses were generally disappointing. A handful of candidates correctly matched the regions of the electromagnetic spectrum, but many candidates merely guessed (incorrectly).

### Question 4

This question on sunspots and observing the Sun was generally well-answered. It is pleasing to note that most candidates are aware of the dangers of observing the Sun.

### Question 5

Good responses from most candidates.

### Question 6

Responses to parts (a) and (b) showed that most candidates were able to clearly separate the orbits of Neptune and Pluto, but the number of vague responses ('Pluto's orbit is elliptical') was disappointing. Very few candidates could describe the discovery of Pluto in a convincing manner.

### Question 7

Most candidates were aware of general features of the Moon's surface, but a significant number associated the Moon's seas with the presence of water; indeed, a few candidates replaced *maria* with marina!

### Question 8

The responses to this question on seasons impressed the examiners and there were some good and well-illustrated explanations of why it is warmer in July than January in the northern hemisphere. Some responses contained the misconception that it is warmer in July because of the Earth's shorter distance to the Sun.

### Question 9

This question on galaxies attracted some good responses, but many candidates failed to explain the Local Group of galaxies was a small gathering of galaxies close to ours!

### Question 10

With the exception of (e), there were some very pleasing responses to this question on Apollo and the exploration of the Moon. Very few candidates could describe energy changes, instead using unscientific phrases such as 'the rocket's power must overcome the force of gravity'.

### Question 11

This question on the solar wind and aurorae was answered convincingly by the majority of candidates.

### Question 12

Responses to the two parts of this question on globular and open clusters were generally disappointing. It was hoped that candidates could compare the two types of cluster, but this was generally not the case.

### Question 13

In contrast, this question on planetary orbits was highly successful in discriminating those candidates who appreciated the relative position of a planet and the Sun to render it visible. 'Transit' in part (c) was often misquoted as 'Transition'.

### Question 14

There were some pleasing responses from the majority of candidates. Only part (e) failed to ignite the awareness that relatively warm objects emit infra-red radiation, hence the need for the telescope to be cooled.

### Question 15

This question on comets was answered well by most candidates. Some responses to (b) mystified the examiners, 6 or 36 being common, incorrect answers.

### Question 16

There were some pleasing responses to popular type of question on magnitudes. The examiners were impressed with candidates' explanations of why alpha was closer to the Earth.

However, there was an alarmingly large number of candidates who associated the Greek letters labelling stars in a constellation in terms of their apparent brightness with the type of (radioactive) emission from the stars!

**Question 17**

There were some well-labelled diagrams of comets, but many candidates lost marks through insufficient labelling in part (a).

**Question 18**

This question was a good discriminator. Some candidates could sketch the two light curves convincingly, but many merely guessed; indeed, many candidates confused the light curve of a Cepheid variable with that of an eclipsing binary star.

**Question 19**

This question stretched many candidates, with mixed responses. There was a general lack of awareness of what redshift actually was (an increase in the wavelength of spectral lines), with many candidates stating what it implied (motion away from the observer). However, many responses to (c) and (d) on dark matter were convincing.

**Question 20**

This was very demanding and served as a good discriminator, particularly at the A/B grade boundary. Most candidates could relate the apparent motion of stars due to the rotation of the Earth in (a) and (d), but relatively few were able to correctly predict the positions of the star in (b) and (c).

## Grade Boundaries

The subject is grade out of a maximum of 160 Subject marks.

	A*	A	B	C	D	E	F	G
Mark/160	119	99	79	60	50	41	32	23





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