



General Certificate of Education

General Studies 6761 *Specification A*

GSA5 **Science, Mathematics and Technology**

Report on the Examination *2008 examination - June series*

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Unit 5 Question 1

(GSA5/1 Science, Mathematics and Technology)

This component is an objective test for which the following list indicates the correct answers used in marking the candidates' responses.

1.1	A	1.11	B
1.2	A	1.12	B
1.3	A	1.13	C
1.4	D	1.14	D
1.5	A	1.15	A
1.6	C	1.16	B
1.7	B	1.17	B
1.8	D	1.18	A
1.9	A	1.19	A
1.10	A	1.20	A

GSA5 Science, Mathematics and Technology

Section 1

(Questions 1.1 to 1.20)

The performance of candidates on this section of the paper was very similar to that on the corresponding section last year. In June 2007 the mean facility of the questions was 71% and this year it was also 71% overall (with the facility for males being 74% and that for females being 68%). All questions except one (question 12, which had a very high facility) discriminated satisfactorily between the best and worst performing candidates, some questions very strongly.

All questions appeared to be accessible to the majority of candidates; there were none with a facility of less than 40% and many questions that most candidates appear to have found easy to answer.

Notes on selected questions

The mean facility of the four groups of questions, Crystal Models, Mobility, Packaging and Pulleys, were very similar, with packaging being the one that candidates found easiest and pulleys the hardest.

In the first group of questions, Crystal Models, two apparently similar questions, numbers 1.3 and 1.4, were respectively the most difficult and almost the easiest, with 57% of candidates choosing 6 as the number of spheres touching another in 1.3, instead of the correct answer, 3, chosen by only 33% of candidates. In question 1.4, 83% of candidates selected the correct answer, 12. It is possible that some candidates chose this answer by following on from their incorrect answer to question 1.3. Question 1.5, recognizing alternative representations of crystal structures, was the easiest one in this section.

In the short series of questions on mobility, the first two proved to be very easy, with the final question (the second one about the stair-climbing chair) being the most challenging.

The group of questions about packaging were successfully attempted by most candidates, with questions 1.12 and 1.13 being, not surprisingly, particularly easy, though question 1.13 still discriminated well.

The pulleys questions formed the hardest group on this section of the paper but still had a mean facility of 62%. Question 1.18, requiring candidates to identify the sizes of the forces acting on a pulley, had the highest success rate in the group (83%) but the following question, asking for the resultant force on a stationary pulley, had the lowest (40%).

Section 2

General comments

The following table provides an approximate guide to the popularity of the six optional essay questions offered in the summer 2008 examination.

2.1	2.2	2.3	2.4	2.5	2.6
60%	6%	6%	8%	7%	13%

This was a little disappointing for examiners, who had hoped for a more even distribution. Question 2.1 on obesity was, by a large margin, the most frequently answered question, but it had been anticipated that the other questions, particularly those on mobile technology and environmental sustainability, would be more popular than proved to be the case.

The marks for each question were awarded in two parts, with up to 20 marks awarded for content based on Assessment Objectives AO1, AO3 and AO4 according to five level descriptors; and up to 5 marks were awarded for communication based on Assessment Objective AO2. Examiners were encouraged to use the full range of marks available.

Examiners thought that the overall standard this year was similar to previous years. Good candidates took the opportunity to demonstrate their grasp of scientific issues and to discuss their wider implications. However, some candidates misinterpreted questions (particularly questions 2.4 and 2.5) and wrote generic answers to the question they thought had been asked, rather than the actual question. Centres should remind candidates to consider the wording of each question carefully before embarking on their answer.

All of the questions in this year's paper consisted of two parts. There is no specific allocation of marks for each part. Nevertheless, candidates should be aware that by ignoring or making only a perfunctory effort at one part of the question, they are significantly reducing their prospects of attaining a high mark.

Although there were many very well written answers, examiners noted some significant grammatical concerns. There was the, by now usual, abandonment of apostrophes by many candidates (except where inappropriate), an increasing tendency to run words together (e.g. 'alot', 'infact'), and a failure to use paragraphs. All of these errors make answers less fluent and therefore less likely to get maximum marks for communication.

There continue to be rubric infringements (i.e. candidates attempting all six questions), which tend to be concentrated in individual centres. It is often the case that the candidates concerned demonstrate a wide range of appropriate knowledge, but they are unable to score more than a modest mark because of their self-imposed time constraints. It would be helpful if centres emphasised the requirements of the examination and encouraged candidates to read the examination instructions carefully.

Question 2.1

This was, by a wide margin, the most popular question. Examiners were looking for a scientific explanation of the causes and effects of obesity, along with a discussion of what might be done by individuals and public authorities to reduce the increasing trend to obesity in Britain.

There were many excellent answers to this question. However, many concentrated on social, cultural and economic issues (lifestyle, technology, globalisation, etc.) rather than the science.

While these could be useful as part of the context of increasing obesity, they were not sufficient by themselves to explain obesity in individuals. The discussion was often extensive and interesting, though some candidates offered suggestions that were economically and politically unrealistic in a free society.

Question 2.2

This was attempted by relatively few candidates but, for the most part, those who did answer the question offered detailed and accurate explanations of the nature and origin of comets and asteroids. Most were able to give credible accounts of the likely consequences of an impact on the earth, with many references to the presumed asteroid impact that led to the extinction of the dinosaurs, and rather fewer references to the Tunguska event in Siberia in 1908. There were also useful discussions of strategies to avoid a major impact, only some of which were in the realms of science fiction.

Question 2.3

This was, surprisingly, less popular than might have been anticipated. The question required an explanation of recent developments in mobile technology and a discussion of how this has affected the whole process of collecting and disseminating news and opinion. Examiners were looking for some technological detail about mobile phones, PDAs and similar devices which are capable of not only receiving but transmitting information in a variety of formats. We hoped that the discussion would consider how these developments have made the news process more interactive, with the phenomenon of citizen journalism, blogging and the transmission of pictures and videos outside of the control of the mainstream media and governments.

Most answers contained some appropriate technological information, but the discussions were rather lacking, mostly emphasising the benefits of mobile technology for families and businesses, and the ability to receive the news 'on the move'. Only a few candidates dealt fully with the implications for unofficial news transmission, with the best quoting examples of recent events in Burma and Tibet.

Question 2.4

This question was intended to allow candidates to explain the operation of the ozone layer in protecting the earth from UV radiation, and to identify the damage to the ozone layer caused by chemicals produced for consumer products during the last century. The second part of the question asked for a discussion on the benefits and dangers of sunlight for humans. Some candidates produced answers with excellent detailed science on the damage to the ozone layer, and were aware of recent decisions on limiting the production of CFCs. Far too many, however, confused this issue with the greenhouse effect, and they wrote extensively on global warming to little or no purpose. The second part of the question was too often ignored, while many other answers were distinctly thin on appropriate information and discussion.

Question 2.5

Examiners were looking for explanations of genetic testing, for example of foetuses to determine if particular conditions were present, of adults who may carry certain hereditary diseases, and as part of the criminal investigation process in assembling a DNA database. The second part of the question was looking for a discussion of the ethical issues arising from this testing – for example, possible decisions about termination; the ethics of passing on genetic information to family members, employers, or insurance companies; and the issue of the use of genetic information by the state.

Some candidates wrote very clear answers about the different forms of genetic testing, and discussed the ethical issues in a mature and thoughtful manner. However, many candidates misinterpreted the question and wrote at length on genetic engineering, including cloning, GM crops, 'designer babies', etc. – none of which was an appropriate answer to this particular question.

Question 2.6

In this question, examiners were looking for an explanation of the concept of environmental sustainability, followed by a discussion of what could be done by individual households in Britain to create a more sustainable lifestyle.

Only a few answers attempted more than a very brief definition of environmental sustainability. Most candidates managed to produce a list of appropriate actions that could be undertaken by households, but the higher marks were awarded to candidates who explained how and why these actions were sustainable rather than simply listing them.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the [Results statistics](#) page of the AQA Website.