

2000 HSC Notes from the Examination Centre General Science

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GPO Box 5300
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Tel: (02) 9367 8111

Fax: (02) 9262 6270

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General Science

General Comments

The examination this year required candidates to identify and interpret key words such as "state", "explain", "describe" and "justify" in many questions, with less emphasis on "name" or "list" than in previous years. There was an overall improvement in candidates' performance in this area continuing the trend of the last three years. The structured nature of the questions and the answer booklets provided, gave candidates little opportunity to use prepared answers, and as such, their use showed a continuing decline.

Better responses were directed to the specifics of the questions, expressing information clearly and with appropriate use of labelled diagrams. Candidate's responses to a variety of questions demonstrated thorough preparation in the area of experimental design although the concept of the scientific method and its application continued to be poorly understood by a significant number of candidates.

Section I – Core

PART A – Multiple Choice

General Comments

The table shows the percentage of the candidature correctly answering each question.

Question 1 - 15

Question	Correct Answer	Percentage Correct
1	B	52.23
2	C	61.39
3	D	79.70
4	C	61.34
5	D	66.94
6	A	68.98
7	C	72.06
8	C	89.33
9	B	31.06
10	D	65.42
11	A	50.41
12	C	75.05
13	A	84.08
14	B	64.73
15	C	55.53

The correct response was chosen by over 50% of the candidature in all but one question (Question 9). For this question the candidates' responses were fairly evenly divided between alternatives B, C and D, illustrating a poor grasp of the concept of the Scientific Method by a significant number of candidates.

PART B – Short Response Answers

The general standard of responses was quite good with most candidates clearly articulating their answers and often using labelled diagrams to assist in explanations. There was some evidence that candidates had taken heed of comments in previous examination reports.

There was little difficulty in awarding marks across the full range in all questions, however, there was some variation in the overall mastery by the candidature of individual syllabus areas addressed by each question.

There was some weakness evident in candidates' understanding of Lamarck's explanation for evolution and to its unacceptability to modern science. A significant proportion of candidates had difficulty in explaining the phases of the moon or the variation of shadow lengths in terms of the motion of celestial bodies. There was

some evidence that significant numbers of candidates answered parts of questions by referring to stimulus material in the answer booklet rather than by direct reference to the question. A significant number of candidates were unable to relate efficiency loss in machines to friction.

The responses of candidates dealing with primate characteristics were significantly better than in other areas. Other areas of strength in understanding were dominance and recessiveness of alleles and the relationship of phenotype to genotype. Where diagrams were required or used to assist explanations the overall effectiveness showed an improvement over previous years.

PART C

General Comments

This part of the examination required candidates to use higher order skills to complete their responses. In general, candidates were able to access each question and the full range of marks could be awarded in each question. The better responses gave clear comparisons while a significant proportion stated features instead of comparisons. The better responses justified research in terms of significant consequences for society and linked the evidence from experimental results to the support of a theory. These same candidates were also aware of and able to explain the ethical consequences of and responsibilities arising from scientific research.

One area of particular strength was in the construction of family trees and the understanding of the genetic principles, which are involved. A significant majority of candidates were able to demonstrate their understanding with clear, well-constructed diagrams. Another area of general strength was in the use of data contained within a table and identification of trends within that data.

A significant weakness was revealed in the general understanding of the Scientific Method and in the ability of candidates to identify significant long-term life support problems for space travel.

Section II – Electives

General Comments

As in the previous three years, a common set of marking guidelines was developed for all the elective questions and each candidate's script was independently marked by two markers.

The following comments apply to all of the electives unless otherwise indicated.

The majority of candidates were well prepared and responded to the questions with detailed and well-sequenced answers. The structure given by the questions was adhered to by the candidates and specific experiments carried out by candidates were cited.

Candidates demonstrated familiarity with the terminology of the elective studied and were able to demonstrate their understanding of terms and concepts relevant to that elective. Use of appropriate labelled diagrams and tables by a majority of candidates enhanced their answers and often clarified poorly written or expressed text.

There was some evidence of better planning of answers this year, possibly due to comments made in the previous examination report.

No candidates attempted more than one elective but a small number appeared to answer one they had not studied in depth.

The following table gives the proportion of the candidature attempting each elective.

Question	Percentage of Candidature
32	5.3
33	5.4
34	12.8
35	2.6
36	12.1
37	14.1
38	4.9
39	9.5
40	7.2
41	26.1

Specific Comments

Part (a)

Candidates were able to state the aim of an experiment they had performed that was relevant to the elective studied. A small but significant number of candidates described procedures they had followed but were unable to identify variables and controls. Most candidates could identify the variables but a significant number only identified factors that were kept constant (controlled) during the experiment. Some

candidates simply gave a list of the equipment required. Candidates who were able to describe a control were generally able to explain why it was important.

The method was well described by a majority of candidates with many using well labelled diagrams. Most candidates gave detailed results. These were often clearly presented in tables or as diagrams and where appropriate, graphs were used.

A majority of candidates were able to make valid conclusions and related them well to their aim and results. A significant number of candidates restated their results or drew conclusions not supported by their results.

Problems and safety issues were clearly identified by most candidates. A significant number of responses identified a solution to a problem without clearly stating the problem (e.g. - wear eye protector goggles).

Many candidates had difficulty in describing how their experiment had added to their understanding of the topic.

Part (b)

A significant number of candidates did not clearly address the topic stated in the question, instead using other material relevant to the elective. This was suggestive of prepared answers in some cases. The better candidates were able to outline the article with well-described scientific points under each of the three headings. The required diagrams were well drawn and labelled by the majority of candidates. Only the better responses clearly explained significant relevance of the topic to society.

Part (c)

Most candidates showed good knowledge of terms appropriate to the elective studied, giving clearly expressed and well-defined responses, and often including diagrams where appropriate. Most were able to list two additional terms and often explained them well.