2006 HSC Notes from the Marking Centre

Senior Science

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2006 HSC NOTES FROM THE MARKING CENTRE SENIOR SCIENCE

Introduction

This document has been produced for the teachers and candidates of the Stage 6 course in Senior Science. It provides comments with regard to responses to some questions in the 2006 Higher School Certificate examination, indicating the quality of candidate responses and highlighting the relative strengths and weaknesses of the candidature in each section.

This document should be read along with the relevant syllabus, the 2006 Higher School Certificate examination, the marking guidelines and other support documents which have been developed by the Board of Studies to assist in the teaching and learning of Senior Science.

General Comments

In 2006, 4008 candidates attempted the Senior Science examination. The most popular electives were Disasters (66%) and Pharmaceuticals (17%).

Teachers and candidates should be aware that examiners may write questions that address the syllabus outcomes in a manner that requires candidates to respond by integrating their knowledge, understanding and skills developed through studying the course, including the Prescribed Focus Areas. This reflects the fact that the knowledge, understanding and skills developed through the study of discrete sections should accumulate to a more comprehensive understanding than may be described in each section separately. It is important to understand that the Preliminary HSC course is assumed knowledge for the HSC course.

In 2006, at least one question in Section I Part B and one part of the Section II option questions focused on the mandatory skills content in Module 9.1. Candidates who had actively planned and performed practical experiences clearly demonstrated a deeper knowledge and understanding of the content described in this module.

Overall, the responses indicated a level of understanding of the concepts in the Senior Science course appropriate for most HSC candidates. Candidates need to be reminded that the answer space provided and the marks allocated are guides to the maximum length of response required. Similarly, the key word used in the question gives an indication of the depth of the required response. Candidates should use examination time to analyse the question and plan responses carefully, working within that framework to produce clear and concise responses. Responses may include the use of dot points, diagrams and/or tables, and should avoid internal contradictions. This is particularly so in holistic questions which need to be logical and well-structured. There was evidence that some candidates had a very poor knowledge of basic definitions specific to terminology associated with the course.

Better responses indicate that candidates are following the instructions provided on the examination paper. In these responses, candidates:

- show all working where required by the question
- do not repeat the question as part of the response
- look at the structure of the whole question and note that in some questions the parts follow from each other ie responses in part (a) lead to the required response in part (b) etc

- use appropriate equipment, for example, pencils and a ruler to draw diagrams and graphs. (A clear plastic ruler helps candidates to plot points that are further from the axes and rule straight lines of best fit.)

In Section II the option question is divided into a number of parts. Candidates should clearly label each part of the question when writing in their answer booklets. In part (c) of the 2006 option questions, the best responses presented ideas coherently and included the correct use of scientific principles and ideas. Many candidates wrote a lot of information that was not relevant to the question. Some responses showed evidence of rote learning of an anticipated answer based on a single source. These responses did not address the syllabus content and/or outcomes being assessed and hence did not score full marks. Candidates are required to attempt one question only in Section II, but some candidates responded to more than one option question. Candidates are strongly advised to answer the option they have studied in class.

Section I – Core

Part A – Multiple-choice questions

Question	Correct Response
1	D
2	A
3	D
4	B
5	B
6	C
7	A
8	D
9	B
10	A
11	C
12	A
13	C
14	B
15	B

Part B

Question 16

(a) Better responses clearly stated the meaning and identified an essential quality of surfactants. Weaker responses identified only an application of surfactants in cleaning.

(b) Better responses described the role of emulsifying agents and linked this to their role in cleaning products. Weaker responses only described the role of emulsifying agents and did not link them to the cleaning process or just identified their role in cleaning. The following response demonstrates this link:

Emulsifying agents allow substances that are normally miscible, such as water and oil to mix. In cleaning products the emulsifying agents remove contaminants and hold them in the water so that when an item is rinsed, the contaminants simply wash away with the water.

Question 17

(a) (i) Correct responses identified label ‘X’ as the oesophagus and label ‘Y’ as the large intestine.

(ii) Correct responses drew a clear line from the mouth through the oesophagus and stomach to the small intestine.

(b) Better responses correctly identified the site of absorption as the small intestine. They correctly linked the pH of the stomach and of the small intestine to the solubility of the enteric coating. Some mid range responses identified the site of absorption and only related the solubility of the enteric coating to the small intestine. Weaker responses identified the site of absorption and did not relate it to the solubility of the enteric coating of the tablet.

Question 18

(b) Better responses used specific examples to link the location of absorption or site administered with the solubility of the medication. Weaker responses only identified a number of methods of administration.

The following response demonstrates knowledge of solubility and the way medications are administered.
It is important to know about the solubility of medications as this determines the whereabouts in the body the drug will dissolve and be absorbed. For example with the knowledge that some external skin applications are fat soluble, it is known that the drug can be absorbed into the fatty sebaceous glands below the skin and absorbed into the bloodstream. The solubility of materials also determines the rate at which a drug will be absorbed and for how long it will take effect. For example whether or not a drug will be absorbed in the stomach, small intestine, or more quickly absorbed through the lining of the lungs by inhalation or through the nasal cavity from nasal sprays. Their knowledge of solubility is important in determining the way drugs should be administered, as the drug should affect only the intended area with minimal or no side effects to other parts of the body, which can be determined by knowing how the drug will react with other body parts eg if it is fat soluble it will be absorbed by fatty tissue.

Question 19

(a) Better responses outlined the steps followed in performing a first-hand investigation, for example, making mayonnaise (oil/ egg/ vinegar) and beaten egg white or eggs.

(b) Better responses included large diagrams with clear labels indicating the components present in two different colloids.

Question 20

Better responses demonstrated a depth of knowledge of issues related to a range of impacts on society, and presented these in a logical, concise manner. Better responses were also able to relate at least one or more issues to one or more impacts. Weaker responses confined the impact of the development of biomaterials to the individual rather than to society.

Question 21

(a) Better responses clearly interpreted this graph and performed accurate calculations to obtain the correct value. Most candidates were able to extract at least one piece of data from the graph.

(b) Better responses distinguished between the functions of the left and right ventricles. Weaker responses described features of the ventricles but did not relate these features to their functions.

Question 22

(a) Most responses demonstrated a clear understanding of controlling variables. Some responses identified the concept of repetition under the same conditions as one way to confirm reliability. Some weaker responses neglected to include safety considerations and some did not identify the dependent variable.

Question 24

(a) Better responses used the stimulus material together with their knowledge and understanding to provide a range of advantages. The following response is one that used the stimulus material as well as demonstrating knowledge and understanding of the module content.

Specific application – some communication systems are better suited to different tasks. For eg FM radio is better to transfer larger quantities of information at a time. However in this case AM radio is better for communications as AM radio waves can travel much further distances.
Reliability – if one form of communication fails, it can be taken over by another thus creating reliability. Example as landline telephones weren't working due to line breaks, destruction of base stations and power failures. As a result mobile phones were used as it didn't require the inputs of landline telephone. Another example, as television stations were down and local newspapers closed, news was spread through broadcasting on the internet.

Question 25

(a) Better responses correctly named a satellite capable of providing real-time information to Australia. Some responses showed confusion between the names of commercial broadcasters or corporations who use satellite technology, with the actual name of the satellite.

Question 26

Better responses described examples of a number of important global communication systems and linked these to several specific consequences as well as the positive and negative impacts on society. Better responses also focused on global systems rather than local personalised impacts, as well as drawing out the relationship between them and the changes they made to society.

Weaker responses outlined or described the features of some historical changes in communication systems, but failed to draw out the relationship between them and the changes they made to society.

Section II – Options

Question 27 – Polymers

(a) (ii) Better responses named a specific synthetic polymer and related its function to its properties. Weaker responses stated the polymer name as 'plastic' and provided some generic properties of most plastics.

(b) (i) Weaker responses often provided a way to improve the accuracy of the investigation, but did not provide a reason.

(ii) Better responses made a clear judgement with supporting evidence about the validity of the students' conclusion and included areas where the validity of the experiment could have been improved.

(c) Better responses related the use of the plastic to how it made its impact on society. Weaker responses only listed uses for plastics and how their properties made them useful and did not make any judgements.

(d) (i) Better responses described one of several methods to determine the amount (number / mass / volume) of plastic material being thrown away, and included a hygienic method of handling the waste material.

(ii) The best responses used the code to explain domestic and industrial sorting of plastic wastes as well as including an economic impact of this sorting on the industry. These responses also demonstrated an understanding of the importance of recycling.

Question 28 – Preservatives and Additives

(a) (ii) Better responses sketched in general terms the specific purpose of an additive, and gave a secondary effect. Weaker responses referred to general effects such as allergies or improved flavour or colour.

(c) Better responses recognised that not all food spoilage was due to micro-organisms and that physical damage and the activity of enzymes could also lead to significant spoilage in food. Weaker responses described various food preservation methods.

(d) (i) Better responses gave a clear statement of how one salt would be deemed more soluble than the other. Some weaker responses did not include a safety measure or a method of comparing the solubility of the two salts.

(ii) Better responses referred to domestic preparation techniques, listed several methods that would reduce the risk of microbial contamination and related these actions to their effect on the microbial load present.

Question 29 – Pharmaceuticals

(a) (ii) Better responses identified at least two similarities or differences between the responses of muscles and glands.

(c) Better responses explained the actions of aspirin and made judgements about the impacts of aspirin on society. Weaker responses identified actions using vague terms without an explanation and made simple statements about the societal impacts.

(d) (i) Better responses correctly named two antibiotics, other than penicillin, and stated their modes of action. Weaker responses often named antibiotics without stating their modes of action.

(ii) Better responses described the risks and drew out the implications of these for disease or infection by pathogenic bacteria.

Question 30 – Disasters

(a) (ii) Better responses explained the precautions and how these could be undertaken to reduce bushfire risk. Weaker responses identified many precautions but did not relate these to a reduction in the risk.

(b) (ii) Some better responses included diagrams of proposed alternative evacuation plans and an evaluation of these. Weaker responses identified aspects of the plan but did not make any judgements.

(c) Better responses provided at least two technologies, described clearly their ability to predict time, place or magnitude and made a judgement about their effectiveness based on this evidence. Weaker responses discussed warning rather than prediction technologies or just listed technologies. Some weaker responses provided strategies for minimising the effects of disasters rather than assessing technological developments.

(d) (i) The better responses provided a safety precaution and a supporting reason.

(ii) Better responses linked the crushing of the can to the differences in air pressure inside and outside the can as well as providing some information on how this difference was produced.

(iii) Better responses related the large differences in air pressure that occur in cyclones and related this to the formation of strong winds.

Question 31– Space Science

(a) (ii) Better responses related requirements to long term stays in space stations and stated how these were able to be satisfied. Weaker responses identified basic requirements but did not clearly outline how the requirements were met.

(b) (i) Better responses accounted for the location, relating it to light pollution, atmospheric pollution or lower atmospheric attenuation. Weaker responses identified aspects of the telescope's location without providing reasons.

(ii) Better responses correctly identified, and showed similarities or differences in, the source of the information gathered as well as how that information was interpreted.

(c) Better responses gave a detailed description of Australia's involvement in astronomy and space exploration, provided specific examples and made a judgement about the significance of Australia's involvement. Some weaker responses provided only a very general idea of Australia's involvement in astronomy and space exploration.

(d) (ii) Better responses provided a more detailed description of the exercise indicating any modifications required in spacecraft and explaining why the exercise was effective in space, identifying the muscle groups that benefited from the exercise.

Senior Science

2006 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I Part A			
1	1	9.2.1 c2 d3 14.1a, b	H2, H8, H14
2	1	9.2.5 c2 dp2, 3	H9`2-3
3	1	9.2.3 c3 dp2 14.1abg	H2, H14
4	1	9.2.1 c2dp4,5, 9.22 c2p3 c3dp4 14.1b	H12.3
5	1	9.2.1 c2 d4 5 c3 d4 9.22 c2 p3	H8, H14
6	1	9.2.1 c3 dp5 12.3c	H12.3
7	1	9.3.2 c2 d9	H7, H9
8	1	c3. d2,6	H8, H9
9	1	9.3.2 c2 d4	H7, H9
10	1	9.3.3 c2 d2, c3 d3, 12.3c	H9, H12
11	1	9.4.5 c2 d3 c3 d1 14.1a	H10, H14
12	1	9.4.3 c3 d1 11.2ab	H11
13	1	9.4.1 c2 d5, c3 d1	H10
14	1	9.4.4 14.1a	H10, H14
15	1	9.4.6 c2d1-2, c3d1 14.3a	H10, H14
Section I Part B			
16 (a)	1	9.2.1 c2 d5	H8
16 (b)	2	9.2.2 c2 d2 d4	H8
17 (a) (i)	2	9.2.5 c2 d1	H9
17 (a) (ii)	1	9.2.5 c2 d1 13.1e	H8, H9, H13
17 (b)	3	9.2.5 c2 d5, c3 d1 14.1b	H14, H8, H9
18 (a) (i)	1	9.2.5 c2 d7	H8
18 (a) (ii)	1	9.2.4 c2 d4	H8

Question	Marks	Content	Syllabus outcomes
18 (b)	4	9.2.5 c2 d6	H8
19 (a)	3	9.2.1 c3 d3, 13.1e	H8, H13
19 (b)	2	9.2.1 c2 d3	H8, H13
20	5	9.3.1 c1	H4
21 (a)	2	9.3.2 c3 d1/2, 12.3C, 12.4b	H12
21 (b)	2	9.3.2 c2 d1	H9
21 (c)	1	9.3.2 c3 d1	H9
21 (d)	2	9.3.2 c2, d1, 14.1d	H9, H14
22 (a)	6	9.3.3 c3 d5, 11.3ab, 11.2bd	H11
22 (b)	2	9.3.3 c3	H15
23	3	9.4.1 c2 d3, 13.1e	H13
24 (a)	4	9.4.1 c2 d6	H4
24 (b)	2	9.4.1 c2 d6	H4
25 (a)	1	9.4.4 c3 d1	H10
25 (b)	1	9.4.4 c3 d1	H10
25 (c)	2	9.4.4 c2 d2	H10
26	7	13.1a 9.4.1 c2 d1, 2, 3, 5, 6 c3 d12, 9.4.2 c2 d2, 3 9.4.3 c2 d1, 2 9.4.6 c2 d3, c3 d2	H1, H10, H13
Section II **Question 27 — Polymers**			
27 (a) (i)	1	9.5.2 c2 d3	H8
27 (a) (ii)	3	9.5.2 c2 d1	H8
27 (b) (i)	2	9.5.2 c3 d2	H12
27 (b) (ii)	4	9.5.1 c3 d2 14.1	H14
27 (c)	7	9.5.3 c2 d4 , 9.5.1, 14.3b	H4, H14
27 (d) (i)	4	9.5.4 c3 d3 1.2	H11
27 (d) (ii)	4	9.5.4 c3 d4	H4, H13

Question	Marks	Content	Syllabus outcomes
Section II **Question 28 — Preservatives and Additives**			
28 (a) (i)	1	9.6.2 c2 d4	H8
28 (a) (ii)	3	9.6.5 c2 d3	H8
28 (b) (i)	3	9.6.6 c2 d3	H8
28 (b) (ii)	3	9.6.3 c3 d4	H8
28 (c)	7	9.6.4 c3 d1 14.3b	H3, H14
28 (d) (i)	4	9.6.2 c3 d2 11.2a b c	H11
28 (d) (ii)	4	9.6.3 c3 d2	H8
Section II **Question 29 — Pharmaceuticals**			
29 (a) (i)	1	9.7.1 c2 d1	H9
29 (a) (ii)	3	9.7.1 c2 d5	H7, H9
29 (b) (i)	3	9.7.2 c2 d2, c3 d1	H9
29 (b) (ii)	3	9.7.3 c2 d5	H9
29 (c)	7	9.7.3 c2 14.3b	H3, H8, H9, H14
29 (d) (i)	4	9.7.4 c3 d5	H7, H8
29 (d) (ii)	4	9.7.4 c3 d2, 12.1b, d	H7, H11, H12
Section II **Question 30 — Disasters**			
30 (a) (i)	1	9.8.3 c2 d6	H10
30 (a) (ii)	3	9.8.3 c2 d8, c3 d5	H4
30 (b) (i)	1	9.8.4 c2 d1, 14.1	H10, H14
30 (b) (ii)	5	9.8.4 c3 d3, 14.1	H4, H14
30 (c)	7	9.8.2 c2 d4, 5, 6 9.8.3 c2 d4, 5 c3 d2, 3, 5, 14.3b	H3, H14
30 (d) (i)	2	9.8.2 c3 d1	H11
30 (d) (ii)	3	9.8.2 c3 d1	H10, H14
30 (d) (iii)	3	9.8.2 c2 d3, c3 d2	H10

Question	Marks	Content	Syllabus outcomes
Section II **Question 31 — Space Science**			
31 (a) (i)	1	9.9.5 c2 d2	H3
31 (a) (ii)	3	9.9.5 c2 d1, c3 d5	H7
31 (b) (i)	3	9.9.5 c2 d4	H1
31 (b) (ii)	3	9.9.5 c2 d5, c3 d2, 3, 4	H10
31 (c)	7	9.9.4 c3 d1, 2 9.9.5 c3 d3, 14.3b	H4, H5, H6, H14
31 (d) (i)	2	9.9.3 c2 d5, 6, 7	H7
31 (d) (ii)	6	9.9.3 c3 d1, c2 d6	H1, H7

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NEW SOUTH WALES

2006 HSC Senior Science
Marking Guidelines

Section I, Part B

Question 16 (a)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• States the meaning and identifies essential qualities of surfactants	1

Question 16 (b)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Describes the role of emulsifying agents and links this to their role in cleaning products	2
• Describes the role of emulsifying agents used in cleaning products	1

Question 17 (a) (i)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Both *X* and *Y* labelled correctly	2
• One of *X* or *Y* labelled correctly	1

Question 17 (a) (ii)

Outcomes assessed: H8, H9, H13

MARKING GUIDELINES

Criteria	Marks
• Pathway correctly drawn from the mouth to the small intestine via the oesophagus and stomach	1

Question 17 (b)

Outcomes assessed: H8, H9, H14

MARKING GUIDELINES

Criteria	Marks
• Names the site of absorption • Distinguishes the different pH levels of the stomach and small intestine • Links the pH to the solubility of the enteric coating	3
Any TWO of the following: • Names the site of absorption • The enteric coating protection • Low pH of the stomach • Higher pH of the small intestine	2
• Names the site of absorption OR • The enteric coating protection OR • Low pH of the stomach OR • Higher pH of the small intestine	1

Question 18 (a) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names a water soluble vitamin	1

Question 18 (a) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names an external medication in which the solvent is alcohol	1

Question 18 (b)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Describes the solubility of materials in different solvents • Relates this solubility to different methods of administering medications	4
• Describes the solubility of a medication and relates this solubility to the method of administering it	3
• Describes the solubility of materials in different solvents OR • Identifies different methods of administering medications	2
• Statement about the solubility of materials or a method of administering medications	1

Question 19 (a)

Outcomes assessed: H8, H13

MARKING GUIDELINES

Criteria	Marks
• Identifies the components of both colloids and indicates the key steps to produce each colloid	3
• Correctly identifies the components of both colloids OR • Correctly identifies the components of ONE colloid and indicates ONE key step	2
• Identifies ONE key step in producing ONE colloid OR • Identifies the components of ONE colloid	1

Question 19 (b)

Outcomes assessed: H8, H13

MARKING GUIDELINES

Criteria	Marks
• Two correctly labelled diagrams illustrating differences	2
• One correctly labelled diagram OR • A correct description of differences given	1

Question 20

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Relates the identified issues to the positive impacts on society	4–5
• Identifies issues OR • Identifies positive impacts on society OR • Relates one identified issue with an impact on society	2–3
• Identifies ONE issue OR • Identifies ONE positive impact on society	1

Question 21 (a)

Outcomes assessed: H12

MARKING GUIDELINES

Criteria	Marks
• Correctly calculates the average time per heartbeat	2
• Identifies ONE correct piece of data in working (number of beats, time for beats identified approximately)	1

Question 21 (b)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Identify and give features of both ventricles	2
• Identifies ONE of the roles of the ventricles	1

Question 21 (c)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Proposes that the number of beats in the same time interval would be greater OR • The peaks would be closer together	1

Question 21 (d)

Outcomes assessed: H9, H14

MARKING GUIDELINES

Criteria	Marks
• Describes a change in heart activity • Gives reason for change	2
• ONE of the above	1

Question 22 (a)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Identifies dependent and independent variable • Describes controlled variables • Identifies a method of increasing the reliability of results • Describes safety measures • Outlines logical procedure	6
• Outlines procedure • Identifies 4/5 components of investigation (as above)	4 – 5
• Identifies 2/3 components of investigation (as above)	2 – 3
• Identifies one component of investigation (above)	1

Question 22 (b)

Outcomes assessed: H15

MARKING GUIDELINES

Criteria	Marks
• Identifies benefit and its cause	2
• Identifies one benefit	1

Question 23

Outcomes assessed: H13

MARKING GUIDELINES

Criteria	Marks
• Tabulates the classification of A as verbal and B as non-verbal	3
• Classifies A as verbal and B as non-verbal OR • A or B correctly identified in a table	2
• Classifies EITHER A as verbal OR B as non-verbal OR • Draws correct table	1

Question 24 (a)

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Identifies advantages of using a range of information systems • Provides points to support these advantages	4
• Identifies advantages of using a range of information systems OR • Identifies an advantage of using a range of information systems AND • Provides support for this advantage	2 – 3
• Identifies an advantage of using a range of information systems	1

Question 24 (b)

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Provides reasons for the use of satellite phones	2
• Provides a reason for the use of satellite phones	1

Question 25 (a)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Names an Australian satellite	1

Question 25 (b)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• States ONE reason	1

Question 25 (c)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Shows the relationship between the fixed position of geostationary satellites to the permanent direction of receiving dish	2
• Identifies geostationary satellite OR • Identifies that dish always faces satellite	1

Question 26

Outcomes assessed: H1, H10, H13

MARKING GUIDELINES

Criteria	Marks
• Describes examples of world-wide communication systems • Discusses consequences of these systems • Draws out implications for changes in society	6–7
• Discusses consequences of world-wide communication systems • Identifies changes in society OR • Thoroughly discusses the consequences of a world-wide communication systems • Draws out implications for changes in society	4–5
• Identifies an example of a world-wide communication system • Identifies a consequence of this system • Identifies a change in society OR • Identifies examples of world-wide communication systems with limited reference to consequences or changes in society OR • Outlines changes in society caused by the development of world-wide communication systems	2–3
• Identifies an example of world-wide communication systems OR • Identifies a change in society	1

Section II

Question 27 (a) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names one source of petrochemicals	1

Question 27 (a) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names a synthetic polymer • States its use • Relates use to property	3
• Any TWO of the above	2
• Any ONE of the above	1

Question 27 (b) (i)

Outcomes assessed: H12

MARKING GUIDELINES

Criteria	Marks
• Describes a way in which accuracy could be improved • Reason why accuracy is improved	2
• Identifies a way accuracy could be improved	1

Question 27 (b) (ii)

Outcomes assessed: H14

MARKING GUIDELINES

Criteria	Marks
• Makes a judgement of the validity of the conclusion • Supports judgement based on criteria	4
• Makes a judgement of the validity of the conclusion with some support	2–3
• Makes judgement of the validity of the conclusion with limited support	1

Question 27 (c)

Outcomes assessed: H4, H14

MARKING GUIDELINES

Criteria	Marks
• Describes impacts of use of plastics on society and environment • Makes a judgement based on criteria • Provides a response that demonstrates coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Describes impacts of use of plastics on society and the environment OR • Describes impacts on environment or society • Makes a judgement based on some identified criteria	4–5
• Identifies impacts of use of plastics on society and the environment OR • Identifies impacts on environment or society • Makes a judgement	2–3
• Identifies impacts of use of plastics on society or the environment OR • Makes a judgement	1

Question 27 (d) (i)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Clearly describes a procedure that includes safe methods of gathering, sorting and measuring the amount of discarded plastic material	4
• Describes an investigation that includes some of the above features	2–3
• Identifies one feature of the investigation	1

Question 27 (d) (ii)

Outcomes assessed: H4, H13

MARKING GUIDELINES

Criteria	Marks
• Provides features of the coding system used to identify plastics • Describes how the coding system is used to sort plastics • Gives reasons why plastics need to be sorted before they can be recycled	4
• Provides features of the coding system used to identify plastics And either • Describes how the coding system is used to sort plastics OR • Gives reasons why plastics need to be sorted before they can be recycled	2–3
• Correct statement relating to the coding or recycling of plastics	1

Question 28 (a) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names ONE additive	1

Question 28 (a) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names a different food additive • Identifies its specific purpose • States another effect of this additive	3
• Names a different food additive AND EITHER • Identifies its specific purpose OR • States another effect of this additive	2
• Names a different food additive	1

Question 28 (b) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Provides THREE reasons for using codes on this label	3
• Provides TWO reasons for using codes on this label	2
• Provides ONE reasons for using codes on this label	1

Question 28 (b) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names the preservation method used • Describes TWO reasons why this process preserves the cream	3
• Names the preservation method used • Describes ONE reason why this process preserves the cream OR • Describes TWO reasons why this process preserves the cream	2
• Names the preservation method OR • Identifies ONE reason why this process preserves the cream	1

Question 28 (c)

Outcomes assessed: H3, H14

MARKING GUIDELINES

Criteria	Marks
• Discusses the discovery of how food spoils and relates this understanding to methods of food preservation developed before and after this discovery • Provides a response that demonstrates coherence and logical progression and includes correct use of scientific principles and ideas	7
• Describes the development of food preservation methods with some links to bacteria causing food spoilage	5–6
• Describes the development of food preservation methods	3–4
Two of: • Identifies that microbes cause food spoilage • Identifies preservation techniques that kill or slow the growth of microbes • Identifies one method of food preservation	1–2

Question 28 (d) (i)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Clarifies a procedure that clearly identifies – Dependent variable – How the dependent variable was measured – One controlled variable – One safety precaution	4
• Any THREE of the above	3
• Any TWO of the above	2
• Any ONE of the above	1

Question 28 (d) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Identifies ways in which microbial contamination risks can be minimised • Relates how these ways minimise the risk of contamination	4
• Identifies ways in which microbial contamination risks can be minimised • Relates how ONE of these ways minimised the risk of contamination	3
• Identifies two ways in which microbial contamination risks can be minimised OR • Identifies a ways in which microbial contamination risks can be minimised • Relates how this way minimised the risk of contamination	2
• Identifies a way in which microbial contamination risks can be minimised	1

Question 29 (a) (i)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• States one component of the central nervous system	1

Question 29 (a) (ii)

Outcomes assessed: H7, H9

MARKING GUIDELINES

Criteria	Marks
• Identifies THREE similarities and/or differences	3
• Identifies TWO similarities and/or differences	2
• Identifies ONE similarity or difference	1

Question 29 (b) (i)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Names blood vessel X • Provides TWO differences between X and capillaries	3
• Names blood vessel X • Provides ONE difference between X and capillaries OR • Incorrectly identifies blood vessel X but gives two correct differences between X and capillaries	2
• Names blood vessel X OR • Provides ONE difference between X and capillaries	1

Question 29 (b) (ii)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Provides reasons by describing three features of the circulatory system that are relevant to the transport of pharmaceuticals around the body	3
• Provides reasons by describing two features of the circulatory system that are relevant to the transport of pharmaceuticals around the body	2
• Describes a feature of the circulatory system that is relevant to the transport of pharmaceuticals around the body	1

Question 29 (c)

Outcomes assessed: H3, H8, H9, H14

MARKING GUIDELINES

Criteria	Marks
• Identifies and explains actions of aspirin • Makes a reasoned judgement about the impacts of aspirin on society • Provides a response that demonstrates coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Identifies actions and explains one of them AND makes a reasoned judgement OR • Identifies and explains TWO actions	4–5
• Identifies actions AND makes a basic judgement OR • Identifies and explains an action AND makes a basic judgement	2–3
• Any one statement relating to action of aspirin OR its usefulness to society	1

Question 29 (d) (i)

Outcomes assessed: H7, H8

MARKING GUIDELINES

Criteria	Marks
• States TWO antibiotics and the modes of action of each one	4
• States TWO antibiotics and the mode of action of one	3
• States ONE antibiotic and its mode of action OR • States TWO antibiotics OR • States TWO modes of action	2
• States ONE antibiotic OR • ONE mode of action	1

Question 29 (d) (ii)

Outcomes assessed: H7, H11, H12

MARKING GUIDELINES

Criteria	Marks
• Describes risks involved in culturing bacteria from the surroundings • Draws out implications for disease/infection	4
• Describes a risk involved in culturing bacteria from the surroundings • Draws out implications for disease/infection OR • Describes two risks involved in culturing bacteria from the surroundings	3
• Identifies two risks involved in culturing bacteria from the surroundings OR • Identifies one risk and one implication	2
• Identifies one risk	1

Question 30 (a) (i)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Names the factor that can affect the speed of a bushfire at site A	1

Question 30 (a) (ii)

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Identifies precautions and relates these to reduced risk	3
• Identifies a precaution and relates this to reduced risk OR • Identifies precautions	2
• Identifies a precaution	1

Question 30 (b) (i)

Outcomes assessed: H10, H14

MARKING GUIDELINES

Criteria	Marks
• Names a device that is useful for warning about a fire in this school	1

Question 30 (b) (ii)

Outcomes assessed: H4, H14

MARKING GUIDELINES

Criteria	Marks
• Relates judgement(s) to TWO identified criteria	5
• Identifies TWO criteria and relates a judgement to ONE criteria OR • Relates judgement to an identified criteria	3-4
• Makes judgement based on ONE criteria OR • Lists TWO criteria	2
• Makes a judgement OR • Lists ONE criteria	1

Question 30 (c)

Outcomes assessed: H3, H14

MARKING GUIDELINES

Criteria	Marks
• Relates several technological developments to the improvement in the prediction of disasters • Makes a judgement about the effectiveness of these developments • Provides a response that demonstrates coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Identifies technological developments and relates these to prediction and/or warning of disasters	4–5
• Identifies a technological development and relates this to its effect on prediction or warning of disasters OR • Identifies several technological developments associated with prediction or warning of disasters	2–3
• Identifies a technological development associated with either prediction or warning of disasters	1

Question 30 (d) (i)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Relates hazard to precaution	2
• Identifies one safety precaution OR • Identifies hazard	1

Question 30 (d) (ii)

Outcomes assessed: H10, H14

MARKING GUIDELINES

Criteria	Marks
• Relates the difference in air pressure to the crumpling of the can • Outlines a cause of this difference	3
• Relates difference in air pressure to the crumpling of the can OR • Outlines the cause of difference in air pressure	2
• Identifies difference in air pressure inside and outside of can OR • Identifies that steam increases air pressure inside the can OR • Identifies that condensation decreases air pressure	1

Question 30 (d) (iii)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Identifies the cause of low pressure systems and relates the effect this has on the movement of air resulting in cyclones	3
• Identifies that hot air rises, causing areas of low pressure AND EITHER • Air spirals as it rises OR • Rotation of earth causes rapidly rotating winds OR • Cyclones are low pressure regions	2
• Identifies that hot air rises causing areas of low atmospheric pressure OR • Rising air spirals as it rises OR • Rotation of earth causes rapidly rotating winds	1

Question 31 (a) (i)

Outcomes assessed: H3

MARKING GUIDELINES

Criteria	Marks
• Names one space station	1

Question 31 (a) (ii)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms how THREE requirements for sustaining life for several months are met in a space station	3
• Identifies THREE life–sustaining requirements OR • Sketches in general terms how TWO identified requirements are met	2
• Identifies TWO life–sustaining requirements OR • Sketches in general terms how an identified requirement is met	1

Question 31 (b) (i)

Outcomes assessed: H1

MARKING GUIDELINES

Criteria	Marks
• Identifies the telescope type • Relates the reasons for its location	3
• Relates TWO reasons for its location OR • Identifies the telescope type • Relates a reason for its location	2
• Identifies the telescope type as optical OR • Provides a reason for its location	1

Question 31 (b) (ii)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Identifies the type of information detected by both telescopes • Makes ONE valid comparison	3
• Identifies the type of information detected by both telescopes OR • Identifies the type of information detected by either an optical or radio telescope • Makes ONE comparison between the type of information gathered by each of the telescopes	2
• Identifies the type of information detected by one of the telescopes OR • Makes a comparison	1

Question 31 (c)

Outcomes assessed: H4, H5, H6, H14

MARKING GUIDELINES

Criteria	Marks
• Describes Australia's involvement in astronomy and space exploration • Refers to specific Australian examples • Makes a judgement based on criteria • Provides a response that demonstrates coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Describes Australia's involvement in astronomy and/or space exploration AND EITHER • Refers to specific Australian examples OR • Makes a judgement	4–5
• Describes Australia's involvement in either astronomy or space exploration OR • Outlines Australia's involvement in astronomy and/or space exploration AND EITHER • Refers to a specific Australian example OR • Makes a judgement	2–3
• Outlines Australia's involvement in astronomy or space exploration OR • Provides an Australian example	1

Question 31 (d) (i)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• Names TWO human biological effects	2
• Names ONE human biological effect	1

Question 31 (d) (ii)

Outcomes assessed: H1, H7

MARKING GUIDELINES

Criteria	Marks
• Describes exercises astronauts could use • Names the main muscle/muscle groups that benefit from each exercise • States why these exercises work in space	6
• Describes exercises astronauts could use AND EITHER • Names the main muscle/muscle groups that benefit from each exercise OR • States why these exercises work in space	4–5
• Identifies exercises astronauts could use AND EITHER • Names the main muscle groups that benefit OR • States why these exercises work in space	2–3
• Identifies an exercise astronauts could use OR • States why these exercises work in space	1