BOARD OF STUDIES
NEW SOUTH WALES

2009 HSC Senior Science Marking Guidelines

Section I, Part A

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

Section I, Part B

Question 16 (a)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Any ONE of hip joint, shoulder joint, elbow joint, finger joint, knee joint, wrist joint, skull/spine joint or other joint that moves in some form.	1

Question 16 (b)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Identifies Y as cartilage • Identifies function of cartilage in a joint	2
• Identifies Y as cartilage OR • Identifies the function of cartilage in a joint	1

Question 17 (a)

Outcomes assessed: H7, H9, H14

MARKING GUIDELINES

Criteria	Marks
• Relates effect of pulling rubber sheet to its cause	2
• Identifies an effect	1

Question 17 (b)

Outcomes assessed: H9, H12

MARKING GUIDELINES

Criteria	Marks
• Makes a relevant statement about this model AND • Provides a reason for using models in science OR • Provides TWO reasons for using models in science	2
• Makes a relevant statement about this model OR • Provides a reason for using models in science	1

Question 18 (a)

Outcomes assessed: H9, H12, H13

MARKING GUIDELINES

Criteria	Marks
• Draws labelled diagram of the cells accurately representing the photo and includes TWO correct labels	3
• Draws accurate diagram of cells with labels	2
• Draws a simple diagram but only labels one features of cell OR • Accurate representation of cells with no labels	1

Question 18 (b)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Relates the identified role of skin to the identified risk of surgery • States how risk can be reduced	3
• Identifies a risk of surgery • Identifies role of skin OR • Identifies a risk of surgery • States how risk can be reduced OR • Identifies role of the skin • States how risk can be reduced	2
• Identifies a risk of surgery OR • Identifies a role of the skin OR • States how risk of surgery can be reduced	1

Question 19

Outcomes assessed: H10, H12, H14

MARKING GUIDELINES

Criteria	Marks
• Makes correct statements about copper wire and optical fibre related to stimulus material about security and data transfer rates AND • Concludes that optical fibre is better	4
• Makes correct comparison of copper wire and optical fibre for data transfer OR security • Makes a statement about the other factor (data transfer or security)	3
• Makes correct comparison of copper wire and optical fibre for data transfer OR security	2
• Makes a correct relevant statement about copper wire or optical fibre	1

Question 20

Outcomes assessed: H4, H8

MARKING GUIDELINES

Criteria	Marks
• Distinguishes between soap AND soapless detergent AND • Presents beneficial and detrimental effects on the environment, for soap and soapless detergents	5–6
• Provides a feature of soap OR soapless detergent AND • Outlines TWO or more environmental effects	3–4
• Presents ONE factual statement about soaps OR soapless detergent • States ONE environmental effect OR • States TWO environmental effects of either	2
• Makes a factual statement about soaps OR soapless detergents OR • Identifies an environmental effect	1

Question 21 (a)

Outcomes assessed: H13

MARKING GUIDELINES

Criteria	Marks
• Distinguishes between heart rate and breathing rate • Axes correctly scaled • Data correctly plotted • Accurate lines drawn	4
• THREE of the above	3
• TWO of the above	2
• ONE of the above	1

Question 21 (b)

Outcomes assessed: H14

MARKING GUIDELINES

Criteria	Marks
• Relates the trend to a specific physiological change	2
• Identify that heart rate increases with time	1

Question 22 (a)

Outcomes assessed: H12, H13

MARKING GUIDELINES

Criteria	Marks
• Provides correct answer with units	2
• Provides correct answer without correct units OR • Provides correct substitution into formula shown	1

Question 22 (b)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• States TWO advantages of using optical fibre link over satellite link	2
• States ONE advantage of using optical fibre link over satellite link	1

Question 23 (a)

Outcomes assessed: H8, H11

MARKING GUIDELINES

Criteria	Marks
• Identifies number of drops as dependent variable	1

Question 23 (b)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Identifies a feature of the investigation that ensures its validity	1

Question 23 (c)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Relates the results of the investigation to the changes detergent makes to the surface tension of water	2
• States a change in the behaviour of the water due to detergent	1

Question 24 (a)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Names TWO properties	2
• Names ONE property	1

Question 24 (b)

Outcomes assessed: H10, H13

MARKING GUIDELINES

Criteria	Marks
• Shows path of the ray of light through core of fibre • Shows the correct application of reflection	2
• Shows a reflected ray that remains in the central core	1

Question 25 (a)

Outcomes assessed: H3, H7, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Relates the identified scientific idea to the technology for each technology	2
• Identifies a relevant scientific idea OR • Identifies a relevant feature of the technology	1

Question 25 (b)

Outcomes assessed: H5, H7, H9, H10

MARKING GUIDELINES

Criteria	Marks
• Explains how identified research could lead to improvement of identified technology	2
• Identifies a relevant possible future direction of scientific research	1

Question 26

Outcomes assessed: H9, H10

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of all THREE suggested diagnostic methods • Provides a specific supported judgement of appropriate test	5
• Demonstrates thorough knowledge and understanding of suggested diagnostic method(s) • Provides a specific supported judgement of an appropriate test	3–4
• Demonstrates a basic knowledge of diagnostic tests	2
• Demonstrates a limited knowledge of one diagnostic test	1

Question 27

Outcomes assessed: H10, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of energy conversions as they relate to communications technology • Provides features and characteristics of THREE steps in the process • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6
• Demonstrates sound knowledge and understanding of energy conversions as they relate to communication technology • Provides features and characteristics of TWO steps in the process OR outlines THREE steps • Communicates some scientific principles and ideas in a clear manner	4–5
• Demonstrates a basic knowledge of energy conversions as they relate to communication technology • Provides features of ONE step in the process OR outlines steps in the process • Communicates ideas in a basic form using general scientific terms	2–3
• Demonstrates a limited knowledge of energy conversions • Communicates simple ideas	1

Question 28 (a) (i)

Outcomes assessed: H4, H8

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies meaning of triangles AND numbers	2
• Correctly identifies meaning of triangles OR numbers	1

Question 28 (a) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• State that additives make recycling of PVC difficult or less viable and supports the statement with examples	2
• State that additives make recycling of PVC difficult/expensive or less viable than recycling of other polymers	1

Question 28 (b)

Outcomes assessed: H12, H13

MARKING GUIDELINES

Criteria	Marks
• Percentage shown in table • Magnitude of percentages consistent with the order of sector sizes in the pie chart • Percentages add up to 100	3
• Percentages shown in table AND • Consistent with sector sizes OR • Add up to 100%	2
• Data in rows and columns OR • Adds up to 100%	1

Question 28 (c)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Identifies a relevant thermoset plastic found in household waste	1

Question 28 (d) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms properties of polyester	2
• Correctly identifies ONE property of polyester	1

Question 28 (d) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• States TWO contrasting properties of two polymers in a blend • Gives reasons for the blend being superior to the single polymer	3
• States that blending polymers gives a fabric the useful properties of both polymers OR • States TWO contrasting properties of two polymers in a blend	2
• States that different polymers have different properties OR • States a contrasting property of two polymers in a blend	1

Question 28 (e)

Outcomes assessed: H10, H14

MARKING GUIDELINES

Criteria	Marks
• Gives a definition of decomposer • Identifies that micro-organisms recycle matter	2
• Identifies that micro-organisms decompose (break down) materials into simpler substances OR • Identifies that micro-organisms recycle matter	1

Question 28 (f)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms a relevant method of investigation that specifies what is to be measured • Shows how an aspect of the investigation can be controlled	3
• Sketches in general terms a relevant method of investigation that specifies what is to be measured OR how an aspect of the investigation can be controlled	2
• Names ONE aspect of a relevant method of investigation	1

Question 28 (g)

Outcomes assessed: H3, H5, H8, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of the production of synthetic polymers • Provides everyday examples of the use of polymers • Provides a jugdement of the impact of the shortage of polymers on everyday life • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Demonstrates sound knowledge and understanding of the synthetic polymers • Provides everyday examples of the use of polymers • States an impact of the shortage of polymers • Communicates some scientific principles and ideas in a clear manner	4–5
• Demonstrates a basic knowledge of synthetic polymers • Provides example(s) • Communicates ideas in a basic form using general scientific terms	2–3
• Demonstrates a limited knowledge of synthetic polymers • Communicates simple ideas	1

Question 29 (a) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Identifies type of labeling	1

Question 29 (a) (ii)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Identifies that preservative use is illegal in canned foods • States irrelevant nature of claim	3
• Identifies that canned food does not contain preservatives • States irrelevant nature of claim	2
• Identifies that canned food does not contain preservatives OR • States irrelevant nature of claim	1

Question 29 (b)

Outcomes assessed: H12, H13

MARKING GUIDELINES

Criteria	Marks
• Percentages shown in a table • Magnitude of percentages in table are consistent with the order of sector sizes in the pie chart • Percentages add up to 100%	3
• Percentages shown in a table AND • Consistent with sector sizes OR • Add up to 100%	2
• Data in rows and columns OR Adds up to 100%	1

Question 29 (c)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Correctly names a natural preservative used in food	1

Question 29 (d) (i)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms similarity and ONE relevant difference between the types of preservation techniques	2
• Makes a relevant statement about either type of preservation method	1

Question 29 (d) (ii)

Outcomes assessed: H4

MARKING GUIDELINES

Criteria	Marks
• Describes TWO or more aspects of the impact of food preservation on society • ONE impact on society (either negative/positive)	3
• Describes ONE impact on society related to the preservation methods	2
• Identifies ONE impact on society	1

Question 29 (e) (i)

Outcomes assessed: H7, H8

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms a typical human allergic response AND • Gives a relevant treatment for this response	2
• Names a typical human allergic response OR • Gives a relevant treatment for an allergic response	1

Question 29 (e) (ii)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Identifies a logical method of investigation that must be controlled (ie only one variable)	3
• Identifies that method must be controlled • Refers to one other relevant factor	2
• Suggests one suitable aspect of method	1

Question 29 (f)

Outcomes assessed: H1, H3, H7, H8, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of causes of food spoilage and how this can be controlled/reduced • Shows clearly why modern methods reduce food spoilage during preparation • Provides examples • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Demonstrates sound knowledge and understanding of food spoilage and how this can be controlled/reduced • States effects of food spoilage • Provides examples • Communicates some scientific principles and ideas in a clear manner	4–5
• Demonstrates a basic knowledge of food spoilage and food preparation • Provides examples • Communicates ideas in a basic form using general scientific terms	2–3
• Demonstrates a limited knowledge of food spoilage or food preparation • Communicates simple ideas	1

Question 30 (a) (i)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Identifies the bacteria type	1

Question 30 (a) (ii)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Provides features and characteristics of the process • Names process	3
• Outlines TWO features of the process OR • Names the process AND ONE feature	2
• Names the process OR gives a feature of the process	1

Question 30 (b)

Outcomes assessed: H12, H13

MARKING GUIDELINES

Criteria	Marks
• Percentages shown in a table • Magnitude of percentages in table are consistent with the order of sector sizes in the pie chart • Percentages add up to 100%	3
• Percentages shown in a table AND • Consistent with sector sizes OR • Add up to 100%	2
• Data in rows and columns OR • Adds up to 100%	1

Question 30 (c)

Outcomes assessed: H8

MARKING GUIDELINES

Criteria	Marks
• Identifies an analgesic	1

Question 30 (d) (i)

Outcomes assessed: H9

MARKING GUIDELINES

Criteria	Marks
• Shows how veins and arteries are similar • Shows how veins and arteries are different	2
• Gives a similarity OR • Gives a difference between artery and vein	1

Question 30 (d) (ii)

Outcomes assessed: H7, H9

MARKING GUIDELINES

Criteria	Marks
• Shows clearly how the model relates to the distribution of an injected pharmaceutical	3
• Links injection of drug to entering circulation where it can be transported around the body	2
• A relevant statement about the circulatory system	1

Question 30 (e) (i)

Outcomes assessed: H7, H8, H9

MARKING GUIDELINES

Criteria	Marks
• States a source and mode of action of a named antibiotic	2
• States a source or mode of action of a named antibiotic	1

Question 30 (e) (ii)

Outcomes assessed: H11

MARKING GUIDELINES

Criteria	Marks
• Outline a logical controlled procedure with results	3
• Outline a procedure with results	2
• Outline a procedure or results of an experiment showing bacteria being affected by antibiotics	1

Question 30 (f)

Outcomes assessed: H1, H7, H8, H9, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of inflammation, synapses and the effects of analgesics • Relates the scientific knowledge of inflammation and synapses to the action of analgesics • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Demonstrates sound knowledge and understanding of inflammation, synapses and effects of analgesics • Describes the action of analgesics on inflammation and synapses • Communicates some scientific principles and ideas in a clear manner	4–5
• Demonstrates a basic knowledge of inflammation, synapses and effect of analgesics • Communicates ideas in a basic form using scientific terms	2–3
• Demonstrates a limited knowledge of inflammation OR synapses OR the effects of analgesics • Communicates simple ideas	1

Question 31 (a) (i)

Outcomes assessed: H6

MARKING GUIDELINES

Criteria	Marks
• Names TWO aspects of a natural disaster	2
• Names ONE aspect of a natural disaster	1

Question 31 (a) (ii)

Outcomes assessed: H6

MARKING GUIDELINES

Criteria	Marks
• Identifies location and year of a named natural disaster in Australia since 1970	2
• Identifies location or year of a named natural disaster in Australia since 1970	1

Question 31 (b)

Outcomes assessed: H13

MARKING GUIDELINES

Criteria	Marks
• Percentages shown in a table • Magnitude of percentages in table are consistent with the order of sector sizes in the pie chart • Percentages add up to 100%	3
• Percentages shown in a table AND • Consistent with sector sizes OR • Add up to 100%	2
• Data in rows and columns OR • Adds up to 100%	1

Question 31 (c)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Identify an example of an Australian disaster caused by human activity	1

Question 31 (d) (i)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms a situation and includes the relevant provision from the policy	2
• Outlines a situation OR • Outlines a provision about structure and maintenance	1

Question 31 (d) (ii)

Outcomes assessed: H10, H14

MARKING GUIDELINES

Criteria	Marks
• Makes a correct judgement about payment supported by the insurance policy and refers to the relevant provisions	3
• Makes a correct judgement about payment without support from the insurance policy	2
• Makes a relevant statement	1

Question 31 (e)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• States that closely spaced isobars indicate strong winds AND • Relate isobars or wind to air pressure	2
• Relates isobars to air pressure OR • States that closely spaced isobars indicate strong winds	1

Question 31 (f)

Outcomes assessed: H5, H6, H10

MARKING GUIDELINES

Criteria	Marks
• Describes a modern weather forecasting technique and relates this to reduction in loss of life	3
• Identifies a modern weather forecasting technique and relates it to reduction in loss of life OR • Identifies a modern weather forecasting technique and how it is an improvement OR • Describes a modern weather forecasting technique	2
• Identifies a modern weather forecasting technique OR • Provides a broad statement of how early prediction can reduce loss of life	1

Question 31 (g)

Outcomes assessed: H3, H5, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of the prediction/minimisation of the effect of disasters using available technology • Relates various aspects of disaster management to warning people • Provides a judgement on effectiveness of a system for warning people • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Demonstrates sound knowledge and understanding of the prediction/ minimisation of the effect of disasters using available technology • Provides a judgement on the effectiveness of a system for warning people • Communicates some scientific principles and ideas in a clear manner	4–5
• Demonstrates a basic knowledge of the effect of disasters • Suggests a possible warning system • Communicates ideas in a basic form using general scientific terms	2–3
• Demonstrates a limited knowledge of the effect of disasters • Communicates simple ideas	1

Question 32 (a) (i)

Outcomes assessed: H7, H14

MARKING GUIDELINES

Criteria	Marks
• Provides correct definition for 'circadian rhythm' • Identifies changes over time from the graph	2
• Identifies that this is a process which varies on a daily basis	1

Question 32 (a) (ii)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies TWO activities	2
• Correctly identifies ONE activity	1

Question 32 (b)

Outcomes assessed: H12, H13

MARKING GUIDELINES

Criteria	Marks
• Percentages shown in a table • Magnitude of percentages consistent with the order of sector sizes in the pie chart • Percentages add up to 100%	3
• Percentages shown in a table AND • Consistent with sector sizes OR • Add up to 100%	2
• Data in rows and columns OR • Adds up to 100%	1

Question 32 (c)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Identifies ONE space station currently in use	1

Question 32 (d) (i)

Outcomes assessed: H6, H8

MARKING GUIDELINES

Criteria	Marks
• States that the property is that it's a poor heat conductor (low thermal conductivity)	1

Question 32 (d) (ii)

Outcomes assessed: H6, H8

MARKING GUIDELINES

Criteria	Marks
• Links two conditions encountered during shuttle re-entry to the tile properties identified	4
• Identifies two title properties and relates one of these to re-entry conditions	3
• Identifies two re-entry conditions or one re-entry condition and a tile property	2
• Identifies one re-entry condition or a tile property	1

Question 32 (e)

Outcomes assessed: H7

MARKING GUIDELINES

Criteria	Marks
• States TWO conditions in space which are implicitly linked to space suits' roles	2
• States ONE condition	1

Question 32 (f)

Outcomes assessed: H10

MARKING GUIDELINES

Criteria	Marks
• Makes a judgement that the statement is not correct because space contains both radiation and particles	3
• Makes a judgement that the statement is not correct, supported by one fact	2
• Makes a correct comment about the space traversed by Voyager 2	1

Question 32 (g)

Outcomes assessed: H1, H6, H14

MARKING GUIDELINES

Criteria	Marks
• Demonstrates thorough knowledge and understanding of technologies used to gather information about the universe • Relates the technology to the information gathered • Provides relevant examples • Communicates with coherence and logical progression and includes correct use of scientific principles and ideas	6–7
• Demonstrates sound knowledge and understanding of technologies used to gather information about the universe • Provides names example(s)	4–5
• Demonstrates a basic knowledge of technologies used to gather information about the universe • Communicates ideas in a basic form using general scientific terms	2–3
• Demonstrates a limited knowledge of technologies used to gather information about the universe	1

Senior Science

2009 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I Part A			
1	1	9.2.5.2.7	H8
2	1	9.3.3.2.4	H8
3	1	9.3.3.2.6	H8
4	1	9.2.3.2.2	H7
5	1	9.4, 9.3.5.2.2	H10
6	1	9.3.4.2.1	H9
7	1	9.4.2.2.1, 9.4.2.2.3	H10
8	1	9.2.2.2.2	H8
9	1	9.3.2.2.1, 9.3.2.3.4	H9
10	1	9.3.4.2.2	H9, H7
11	1	9.3.2.2.4, 9.4.5.1, 9.4.5.2.3, 14.1(a), 12.3(c)	H10, H14, H12
12	1	9.2.3.2.4, 9.2.3.3.3, 9.2.4.3.1, 9.2.5.2.3	H7
13	1	9.4.2.2.1	H10
14	1	9.2.1.2.3, 12.3(d), 14.1(a–c)	H8, H12.3, H14
15	1	9.4.1.2.3, 9.4.1.2.5	H10
Section I Part B			
16 (a)	1	9.3.3.2.2	H9
16 (b)	2	9.3.3.2.3	H9
17 (a)	2	9.3.4.3.1	H7, H9, H14
17 (b)	2	9.3.4.3.1	H9, H2
18 (a)	3	9.2.3.3.1, 12.2(b), 13.1(e)	H9, H12, H13
18 (b)	3	9.2.3.2.1, 9.3.5.2.3, 9.3.5.3.1	H9
19	4	9.4.6.3.2, 12.3(c), 14.1(c)	H10, H12, H14
20	6	9.2.2.2.5, 9.2.2.2.6	H4, H8
21 (a)	4	9.3.2.3.1, 13.1(f)	H13
21 (b)	2	9.3.2.3.1, 14.1(a)	H14.1
22 (a)	2	9.4.3.2.1, 9.4.3.2.2, 12.4(b), 13.1(d)	H12, H13
22 (b)	2	9.4.4.1, 9.4.6.2.1	H4, H10
23 (a)	1	9.2.1.3.4, 11.2(a)	H8, H11
23 (b)	1	11.2(c)	H11
23 (c)	2	9.2.1.3.4, 9.2.1.2.5	H8
24 (a)	2	9.4.6.2.1	H8
24 (b)	2	9.4.6.3.1, 13.1(e)	H10, H13
25 (a)	6	9.2.4.3.2, 9.3.5.2.3, 9.4.2.2.1, 9.4.2.3.1, 9.4.3.2.3, 9.3.1.2.1	H3, H7, H9, H10

Question	Marks	Content	Syllabus outcomes
25 (b)	2	9.2.4.3.2, 9.3.5.2.3, 9.4.2.2.1, 9.4.3.2.3, 9.3.1.2.1	H5, H7, H9, H10
26	5	9.3.5.3.1, 9.3.5.2.2, 9.3.2.2.5	H9, H10
27	6	9.4.5.1, 9.4.6.1, 14.3(b)	H10, H14
Section II **Question 28 — Polymers**			
28 (a) (i)	2	9.5.4.3.4	H4, H8
28 (a) (ii)	2	9.5.4.3.1, 9.5.4.2.4	H8
28 (b)	3	9.5.4.3.3, 12.3(c), 13.1(e)	H12, H13
28 (c)	1	9.5.3.2.3	H8
28 (d) (i)	2	9.5.2.2.1	H8
28 (d) (ii)	3	9.5.1.2.4, 9.5.2.2.1, 9.5.1.2.5, 9.5.2.3.3, 9.5.3.3.1	H8
28 (e)	2	9.5.4.2.1	H10
28 (f)	3	9.5.4.2.2, 9.5.4.2.3, 11.2(c)	H11
28 (g)	7	9.5.2.2.3, 14.3(b)	H3, H5, H8, H14
Section II **Question 29 — Preservatives and Additives**			
29 (a) (i)	1	9.6.5.2.1	H8
29 (a) (ii)	3	9.6.5.3.1, 9.6.5.2.4	H8
29 (b)	3	9.6.2, 12.4(b), 12.3(c), 13.1(e)	H12, H13
29 (c)	1	9.6.4.2.1	H8
29 (d) (i)	2	9.6.6.3.4, 9.6.2.3.1, 9.6.2.2.2.	H8
29 (d) (ii)	3	9.6.2.3.7, 9.6.2.2.2	H4
29 (e) (i)	2	9.6.5.3.2	H7, H8
29 (e) (ii)	3	9.6.5.3.2	H2, H11
29 (f)	7	9.6.3.3.2, 9.6.4.3.1, 14.3(b)	H1, H3, H7, H8, H14
Section II **Question 30 — Pharmaceuticals**			
30 (a) (i)	1	9.7.4.2.1	H9
30 (a) (ii)	3	9.7.4.2.3	H9
30 (b)	3	H12.3(c), 12.4(b), 13.1(e)	H12, H13
30 (c)	1	9.7.3	H8
30 (d) (i)	2	9.7.2.2.2, 9.7.2.3.1	H9
30 (d) (ii)	3	9.7.2.2.5	H7, H9
30 (e) (i)	2	9.7.4.3.5	H7, H8, H9
30 (e) (ii)	3	9.7.4.3.5, 11.2(c)	H11
30 (f)	7	9.7.1.2.7, 9.7.3.2.1–7, 9.7.3.3.1, 14.3(b)	H1, H7, H8, H9, H14

Section II **Question 31 — Disasters**			
31 (a) (i)	1	9.8.1.2.1	H6
31 (a) (ii)	3	9.8.1.3.2	H6
31 (b)	3	9.8.1.2.4, 12.4(b), 12.3(c), 13.1(e)	H13
31 (c)	1	9.8.1.2.3	H10
31 (d) (i)	2	9.8.1.3.1	H10
31 (d) (ii)	3	9.8.1.3.1, 14.1(d)	H10, H14
31 (e) (i)	2	9.8.2.2.2	H10
31 (f)	3	9.8.2.2.4, 9.8.2.2.5	H5, H6, H10
31 (g)	7	9.8.4, 9.8.5.2.2, H14.3(b)	H3, H5, H14
Section II **Question 32 — Space Science**			
32 (a) (i)	2	9.9.3.2.78, 14.1a	H7, H14
32 (a) (ii)	2	9.9.3.3.2, 9.9.3.2.8, 9.9.3.2.7	H7
32 (b)	3	13.1(c), 12.4(b), 12.3(c)	H12, H13
32 (c)	1	9.9.5.2.2	H10
32 (d) (i)	1	9.9.4.2.4	H6, H8
32 (d) (ii)	4	9.9.4.2.4	H6, H8
32 (e)	2	9.9.6.2.1	H7
32 (f)	3	9.9.1.2.3	H10
32 (g)	7	9.9.5.3.2, 9.9.5.3.3, 9.9.5.2.4, 9.9.5.2.5, 14.3(b)	H1, H6, H14