BOARD OF STUDIES
NEW SOUTH WALES

2011 HSC Software Design and Development Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	A
3	C
4	B
5	D
6	C
7	D
8	A
9	D
10	B
11	D
12	A
13	C
14	D
15	C
16	C
17	B
18	B
19	A
20	C

Section II

Question 21

Criteria	Marks
• Demonstrates a good understanding of a range of CASE tools and how CASE tools can be used in most stages of the software development cycle	4
• Demonstrates a good understanding of some CASE tools and how CASE tools can be used in some stages of the software development cycle	3
• Demonstrates an understanding of a CASE tool and how it can be used in the software development cycle OR • Provides a good description of two CASE tools	2
• Shows an understanding of one application of a CASE tool	1

Question 22 (a)

Criteria	Marks
• Demonstrates a good understanding of a data flow diagram by including all processes, external entities and stores described in the question, and labelling data flows	4
• Demonstrates a substantial understanding of a data flow diagram by including the majority of the features described in the question	3
• Demonstrates clear understanding of a data flow diagram by including most of a process, an external entity, a data store and a dataflow as described in the question	2
• Demonstrates understanding of some elements of a data flow diagram	1

Question 22 (b)

Criteria	Marks
• Demonstrates substantial understanding of a data dictionary by including appropriate characteristics of two relevant fields of different types	2
• Demonstrates understanding of the contents of a data dictionary by showing a characteristic of one field	1

Question 22 (c)

Criteria	Marks
• Shows a clear understanding of the use of both file types in this scenario	2
• Identifies a characteristic or feature of either file type	1

Question 23

Criteria	Marks
• Describes appropriate debugging techniques, and relates how they can be used in this scenario	3
• Describes a relevant debugging technique	2
• Identifies a relevant debugging technique	1

Question 24 (a)

Criteria	Marks
• Gives benefits of both approaches	3
• Gives benefits of either approach OR ONE benefit of each	2
• Identifies ONE benefit of an approach	1

Question 24 (b)

Criteria	Marks
• Demonstrates a good understanding of the issues	2
• Identifies one relevant issue	1

Question 24 (c)

Criteria	Marks
• Provides a response that shows good understanding of the additional responsibilities required	3
• Elaborates on TWO relevant issues	2
• Identifies ONE relevant issue	1

Question 25

Criteria	Marks
• Shows a good understanding of the test data required for such a scenario	3
• Explains a merit and a weakness of the test data	2
• Identifies a feature of test data relevant to this scenario	1

Question 26 (a)

Criteria	Marks
• Substantially correct desk check	2
• Shows an understanding of desk checking this algorithm	1

Question 26 (b)

Criteria	Marks
• Shows an understanding of the errors in the logic of the algorithm	3
• Shows an understanding of ONE error in the logic of the algorithm by providing an explanation of that error	2
• Identifies an error in the logic of the algorithm	1

Question 27 (a)

Criteria	Marks
• Shows an understanding of both rights and responsibilities	3
• Shows an understanding of at least ONE right and ONE responsibility OR • Shows an understanding of rights OR responsibilities	2
• Identifies a relevant right or responsibility	1

Question 27 (b)

Criteria	Marks
• Shows a good understanding of the advantages and disadvantages of distributing the routine in compiled form	3
• Shows an understanding of ONE advantage and ONE disadvantage of distributing the routine in compiled form	2
• Identifies an advantage OR disadvantage of distributing in compiled form	1

Question 28 (a)

Criteria	Marks
• Demonstrates a clear understanding of a feasibility issue from each area as they apply to this scenario	3
• Demonstrates a good understanding of relevant issues relating to one area	2
• Identifies a feasibility issue in one of the areas	1

Question 28 (b)

Criteria	Marks
• Recommends an appropriate method of implementation for the given scenario providing reasons in support of that method	3
• Describes an implementation method relevant to the given scenario	2
• Identifies an implementation method	1

Question 29 (a)

Criteria	Marks
• A substantially correct solution including all of the following features: – Looping correctly – Referring to elements of the array correctly – Calculating the total points – Taking bonus points into account – Handling the final round correctly	4
• A solution that shows understanding of most of the above features	3
• A solution that shows understanding of some features	2
• A solution that shows understanding of one feature	1

Question 29 (b)

Criteria	Marks
• A substantially correct solution including all of the following features: – Referencing fields in the array of records – Looping through the array, existing appropriately – Determining the need for insertion – Inserting the new item correctly – Correctly dealing with the lowest score item	4
• A solution that shows understanding of most of the above features	3
• A solution that shows understanding of some features	2
• A solution that shows some understanding of one feature	1

Question 30

Criteria	Marks
• A substantially correct solution	3
• An EBNF, with some correct symbols, which shows an understanding of the railroad diagram	2
• Translate one concept of the railroad diagram correctly into EBNF	1

Question 31

Criteria	Marks
• Explains how TWO features can contribute to slow execution	3
• Identifies TWO features that can contribute to slow execution OR • Explains how ONE feature contributes to slow execution	2
• Identifies ONE feature of the code which will contribute to slow execution	1

Question 32

Criteria	Marks
• Demonstrates an understanding of a relevant similarity AND a relevant difference	3
• Shows an understanding of a relevant similarity OR • Shows an understanding of a relevant difference	2
• Identifies a relevant feature of either object code or decompiled code	1

Section III

Question 33 (a)

Criteria	Marks
• Demonstrates understanding of different types of problems that can be solved within the programming paradigms, including their effect on productivity	3
• Demonstrates understanding of how different types of problems can be solved by programming within a paradigm OR • Demonstrates understanding of how a programming paradigm can affect productivity	2
• Identifies a characteristic of a problem that can be solved within a programming paradigm OR • Identifies a characteristic of a programming paradigm that improves productivity	1

Question 33 (b) (i)

Criteria	Marks
• Applies the rule and facts correctly, using backward chaining to determine if the crocodile is a happy pet	2
• Describes backward chaining OR • Attempts backward chaining with an incorrect answer	1

Question 33 (b) (ii)

Criteria	Marks
• Gives substantially correct and efficient code demonstrating all requirements	3
• Provides a substantially correct rule and fact for at least TWO of the requirements	2
• Provides a rule or fact for ONE of the requirements	1

Question 33 (c) (i)

Criteria	Marks
• Demonstrates an understanding of polymorphism by referring to the code to support the response	3
• Demonstrates understanding of polymorphism	2
• Provides a characteristic or an example of polymorphism	1

Question 33 (c) (ii)

Criteria	Marks
• Provides substantially correct code that defines the sub-class PLANE with attributes, and a method to calculate empty seats	3
• Provides substantially correct code unique for the sub-class PLANE	2
• Provides code that includes an attribute OR a method	1

Question 33 (c) (iii)

Criteria	Marks
• Demonstrates a good understanding of the changes needed to the code to enable the colour of a car to be determined	2
• Provides a correct suggestion	1

Question 33 (d)

Criteria	Marks
• Demonstrates an understanding of appropriate paradigm(s) by relating to ALL operations given in the scenario	4
• Demonstrates an understanding of appropriate paradigm(s) by relating to some of the operations given in the scenario	3
• Demonstrates a limited understanding of an appropriate paradigm by relating to an operation given in the scenario	2
• Identifies a relevant characteristic of a paradigm OR • Identifies an appropriate paradigm for one of the components	1

Question 34 (a)

Criteria	Marks
• Demonstrates a sound understanding of two's complement representation	2
• Demonstrates an understanding of a relevant feature of two's complement representation	1

Question 34 (b)

Criteria	Marks
• Demonstrates an understanding of operations that require shifts	2
• Identifies one reason for shifting bits	1

Question 34 (c) (i)

Criteria	Marks
• Shows a good understanding of the effects of the change on the system	2
• Shows a limited understanding of the system	1

Question 34 (c) (ii)

Criteria	Marks
• Draws or describes a circuit that solves the problem	2
• Indicates an appropriate component of the circuit	1

Question 34 (c) (iii)

Criteria	Marks
• Shows an understanding of the operations of a flip-flop and its effect on this system	3
• Explains the role of the flip-flop in this context OR • Shows an understanding of how a flip-flop works	2
• Shows an understanding of the purpose of a flip-flop circuit	1

Question 34 (d)

Criteria	Marks
• Demonstrates an understanding of how these different data types can be represented in binary	3
• Demonstrates an understanding of how a binary number can represent different data types	2
• Demonstrates some understanding of the binary representation of a data type	1

Question 34 (e) (i)

Criteria	Marks
• Produces the correct data stream, showing relevant working	4
• Demonstrates an understanding of the problem by describing a substantially correct data stream	3
• Demonstrates an understanding of the problem through analysis of the given sensor data stream OR • Indicates a component of the output stream	2
• Demonstrates some understanding of the problem	1

Question 34 (e) (ii)

Criteria	Marks
• Describes the differences and/or similarities in the data streams	2
• Identifies a similarity or a difference in the data streams	1

Software Design and Development

2011 HSC Examination Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	9.1.1 – Social and Ethical Issues	H3.1
2	1	9.2.2 – Planning and Design of Software Solutions	H1.3
3	1	9.2.3 – Implementation of Software Solutions	H1.3
4	1	9.2.3 – Implementation of Software Solutions	H1.1
5	1	9.2.3 – Implementation of Software Solutions	H1.1
6	1	9.2.5 – Maintenance of Software Solutions	H4.2
7	1	9.2.2 – Planning and Design of Software Solutions	H4.3
8	1	9.2.2 – Planning and Design of Software Solutions	H1.2
9	1	9.2.3 – Implementation of Software Solutions	H1.1
10	1	9.2.1 – Defining and Understanding the Problem	H1.2, H5.2, H6.1
11	1	9.2.4 – Testing and Evaluation of Software Solutions	H4.2
12	1	9.2.4 – Testing and Evaluation of Software Solutions	H4.2
13	1	9.2.2 – Planning and Design of Software Solutions	H1.3, H6.2
14	1	9.2.3 – Implementation of Software Solutions	H1.2, H5.2
15	1	9.2.3 – Implementation of Software Solutions	H4.2, H4.3
16	1	9.2.2 – Planning and Design of Software Solutions	H1.3
17	1	9.2.3 – Implementation of Software Solutions	H1.3
18	1	9.2.3 – Implementation of Software Solutions	H1.2
19	1	9.2.2 – Planning and Design of Software Solutions	H1.3
20	1	9.2.3 – Implementation of Software Solutions	H1.3, H4.2

Section II

Question	Marks	Content	Syllabus outcomes
21	4	9.1.2 – Application of Software Development Approaches 9.2.2 – Planning and Design of Software Solutions 9.2.3 – Implementation of Software Solutions 9.2.4 – Testing and Evaluation of Software Solutions 9.2.5 – Maintenance of Software Solutions 9.3 – Developing a Solution Package	H4.2, H5.1
22 (a)	4	9.2.1 – Defining and Understanding the Problem 9.2.2 – Planning and Design of Software Solutions	H5.2
22 (b)	2	9.2.3 – Implementation of Software Solutions	H5.2
22 (c)	2	9.2.2 – Planning and Design of Software Solutions	H1.1, H1.3
23	3	9.2.3 – Implementation of Software Solutions	H4.3, H5.2

Question	Marks	Content	Syllabus outcomes
24 (a)	3	9.1.2 – Application of Software Development Approaches	H1.2, H2.2, H4.2
24 (b)	2	9.1.1 – Social and Ethical Issues	H2.2, H3.1
24 (c)	3	9.1.1 – Social and Ethical Issues	H2.2, H3.1
25	3	9.2.4 – Testing and Evaluation of Software Solutions	H4.3
26 (a)	2	9.2.3 – Implementation of Software Solutions	H4.2
26 (b)	3	9.2.4 – Testing and Evaluation of Software Solutions	H4.3
27 (a)	3	9.1.1 – Social and Ethical Issues	H3.1
27 (b)	3	9.2.3 – Implementation of Software Solutions	H1.1, H1.2, H3.1
28 (a)	3	9.2.1 – Defining and Understanding the Problem	H1.2, H4.1
28 (b)	3	9.1.2 – Application of Software Development Approaches	H1.2
29 (a)	4	9.2.2 – Planning and Design of Software Solutions	H1.3, H4.2, H4.3
29 (b)	4	9.2.2 – Planning and Design of Software Solutions	H1.3, H4.2, H4.3
30	3	9.2.3 – Implementation of Software Solutions	H1.2
31	3	9.2.3 – Implementation of Software Solutions 9.2.4 – Testing and Evaluation of Software Solutions	H4.3
32	3	9.2.3 – Implementation of Software Solutions	H1.1

Section III

Question	Marks	Content	Syllabus outcomes
33 (a)	3	9.4.1 – Evolution of Programming Languages	H2.1, H4.1
33 (b) (i)	2	9.4.1 – Evolution of Programming Languages	H4.2
33 (b) (ii)	3	9.4.1 – Evolution of Programming Languages	H4.2
33 (c) (i)	3	9.4.1 – Evolution of Programming Languages	H4.2
33 (c) (ii)	3	9.4.1 – Evolution of Programming Languages	H1.2
33 (c) (iii)	2	9.4.1 – Evolution of Programming Languages	H4.2
33 (d)	4	9.4.1 – Evolution of Programming Languages	H1.2, H2.2, H4.1, H4.2
34 (a)	2	9.4.2 – The Software Developer's View of the Hardware	H1.1
34 (b)	2	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (c) (i)	2	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (c) (ii)	2	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (c) (iii)	3	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (d)	3	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (e) (i)	4	9.4.2 – The Software Developer's View of the Hardware	H1.3
34 (e) (ii)	2	9.4.2 – The Software Developer's View of the Hardware	H1.3, H1.1