

## **2009 HSC Software Design and Development Marking Guidelines**

### **Section I**

<b>Question</b>	<b>Correct Response</b>
1	A
2	C
3	D
4	B
5	B
6	C
7	D
8	D
9	B
10	B
11	C
12	A
13	D
14	C
15	A
16	B
17	C
18	A
19	C
20	D

## Section II

### Question 21 (a) (i)

*Outcomes assessed: H4.2*

#### MARKING GUIDELINES

Criteria	Marks
• Identifies an appropriate development approach and gives reasons justifying its suitability with reference to the situation	3
• Identifies an appropriate development approach and discusses this in the context of the scenario	2
• Identifies a software development approach	1

### Question 21 (a) (ii)

*Outcomes assessed: H5.3, H6.3*

#### MARKING GUIDELINES

Criteria	Marks
• Describes benefits of using the tool in relation to the situation	3
• Describes a benefit of using the tool	2
• Identifies a benefit of the tool	1

**Question 21 (b) (i)***Outcomes assessed: H4.2, H5.1***MARKING GUIDELINES**

Criteria	Marks
• Sketches in general terms technical constraints relevant to the situation	2
• Identifies a technical constraint(s)	1

**Question 21 (b) (ii)***Outcomes assessed: H3.1***MARKING GUIDELINES**

Criteria	Marks
• Discusses relevant social and/or ethical issues for and/or against the operation of the system	3
• Describes a relevant social or ethical issue	2
• Identifies a social or ethical issue	1

**Question 21 (c)***Outcomes assessed: H4.2***MARKING GUIDELINES**

Criteria	Marks
• Describes features examined using live test data, linking conditions to performance	3
• Describes a feature that is examined using live test data related to a performance issue	2
• Identifies a feature examined using live test data	1

### Question 21 (d) (i)

*Outcomes assessed: H1.2, H3.1, H6.1*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies a common cause of failure of software projects</li> </ul>	1

### Question 21 (d) (ii)

*Outcomes assessed: H3.1, H6.1*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies consequences of inappropriately developed software that are relevant to the end-user</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies a consequence of inappropriately developed software that is relevant to the end-user</li> </ul>	1
OR <ul style="list-style-type: none"> <li>Identifies consequences of inappropriately developed software</li> </ul>	

### Question 21 (d) (iii)

*Outcomes assessed: H3.1*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Describes the responsibilities of developers making evident the relationship between the responsibilities of developers and successful software projects</li> </ul>	3
<ul style="list-style-type: none"> <li>Briefly describes responsibilities of software developers</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies a responsibility of software developers</li> </ul>	1

### Question 22 (a) (i)

*Outcomes assessed: H5.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Correctly names the tool</li> </ul>	1

### Question 22 (a) (ii)

*Outcomes assessed: H5.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Explains the use of this particular tool</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies a purpose of the tool</li> </ul>	1

### Question 22 (b) (i)

*Outcomes assessed: H4.2, H5.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Shows changes to all variables during the processing of the algorithm, producing a correct sort</li> </ul>	4
<ul style="list-style-type: none"> <li>Shows changes which are substantially correct, to most of the variables during the processing of the algorithm</li> </ul>	3
<ul style="list-style-type: none"> <li>Makes some attempt at changes to some of the variables following the processing of the algorithm</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies some of the variables used in the algorithm using a disk check structure</li> </ul>	1

**Question 22 (b) (ii)***Outcomes assessed: H6.2***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"><li>Provides characteristics and/or features of the standard algorithm</li></ul> AND <ul style="list-style-type: none"><li>Identifies the standard algorithm</li></ul>	2
<ul style="list-style-type: none"><li>Provides characteristics and/or features of the standard algorithm</li></ul> OR <ul style="list-style-type: none"><li>Identifies the standard algorithm</li></ul>	1

**Question 22 (b) (iii)***Outcomes assessed: H4.2, H5.2***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none"><li>Writes an algorithm which uses a temporary variable to swap data</li></ul> AND <ul style="list-style-type: none"><li>Shows the passing of parameters</li></ul>	3
<ul style="list-style-type: none"><li>Uses a temporary variable to appropriately swap data within a sub-program</li></ul>	2
<ul style="list-style-type: none"><li>Demonstrates some understanding of swap algorithm</li></ul>	1

### Question 22 (c) (i)

*Outcomes assessed: H5.1, H5.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Draws a data flow diagram which; <ul style="list-style-type: none"> <li>Appropriately uses all of the diagram elements: external entity, process, data store and data flow line</li> </ul> </li> </ul> AND <ul style="list-style-type: none"> <li>Provides an accurate representation of the scenario</li> </ul>	4
<ul style="list-style-type: none"> <li>Draws a data flow diagram which: <ul style="list-style-type: none"> <li>Appropriately uses most of the diagram elements: external entity, process, data store and data flow line</li> </ul> </li> </ul> AND <ul style="list-style-type: none"> <li>Provides a partial representation of the scenario</li> </ul>	3
<ul style="list-style-type: none"> <li>Draws a data flow diagram which: <ul style="list-style-type: none"> <li>Uses some of the diagram elements: external entity, process, data store and data flow line</li> </ul> </li> </ul> AND <ul style="list-style-type: none"> <li>Provides a rudimentary representation of the scenario</li> </ul>	2
<ul style="list-style-type: none"> <li>Draws a diagram which displays a knowledge of some of the data flow diagram elements: external entity, process, data store and data flow line</li> </ul>	1

### Question 22 (c) (ii)

*Outcomes assessed: H5.1, H5.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Constructs a data dictionary which is substantially correct</li> </ul>	4
<ul style="list-style-type: none"> <li>Constructs a data dictionary which displays most of the characteristics of the fields</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Identifies most of the variables/data in the system</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Provides some details which describe the variables/data identified</li> </ul>	3
<ul style="list-style-type: none"> <li>Constructs a data dictionary which displays some of the common characteristics of the fields</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>Identifies some of the variables/data in the electronic assessment submission system</li> </ul>	2
<ul style="list-style-type: none"> <li>Constructs a data dictionary which displays some of the common characteristics of the fields in a data dictionary <ul style="list-style-type: none"> <li>Field name</li> <li>Data type</li> <li>Field width</li> <li>Number of decimal places</li> <li>Description of the purpose of the field</li> </ul> </li> </ul>	1



**Question 23 (a) (i)***Outcomes assessed: H6.1***MARKING GUIDELINES**

Criteria	Marks
• Recognises and names appropriate reasons for changing the code of an existing solution	2
• Recognises and names a reason why a modification would be made	1

**Question 23 (a) (ii)***Outcomes assessed: H5.2***MARKING GUIDELINES**

Criteria	Marks
• Makes evident the relationship between different forms of documentation and how it would assist in locating code to be changed	3
• Indicates the main features of different types of relevant documentation OR • Indicates how one identified form of documentation would assist in locating code to be changed	2
• Identifies how one identified form of documentation would assist in locating code to be changed	1

**Question 23 (b) (i)***Outcomes assessed: H4.2, H4.3***MARKING GUIDELINES**

Criteria	Marks
• Identifies and describes the error	2
• Identifies where the error lies	1

### Question 23 (b) (ii)

Outcomes assessed: H4.2, H4.3

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Provides evidence as to how the value of the variable is used to detect a false start or Start Block Occupied = False</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies that a starting time remaining at –1.000, or Start Block Occupied = False, would be used to identify a false start</li> </ul>	1

### Question 23 (b) (iii)

Outcomes assessed: H4.2, H4.3

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Includes correct statement to display AND</li> <li>Locates it correctly</li> </ul>	2
<ul style="list-style-type: none"> <li>Includes a correct statement to display OR locates it correctly</li> </ul>	1

### Question 23 (c) (i)

Outcomes assessed: H4.2

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Names the correct data structure</li> </ul>	1

### Question 23 (c) (ii)

Outcomes assessed: H4.2, H4.3

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies TWO errors AND</li> <li>Describes the impacts of both errors</li> </ul>	3
<ul style="list-style-type: none"> <li>Identifies TWO errors OR</li> <li>Identifies ONE error and describes its impact</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies ONE error OR identifies an impact</li> </ul>	1

**Question 23 (c) (iii)***Outcomes assessed: H4.2, H4.3***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
• Demonstrates understanding by providing a substantially correct algorithm that solves the problem	5
• Demonstrates understanding by providing relevant segments of an algorithm, providing a partial solution to the problem	3–4
• Attempts to develop a solution to the problem	1–2

## Section III

### Question 24 (a) (i)

*Outcomes assessed: H1.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Correctly identifies a method from the code segment</li> </ul>	1

### Question 24 (a) (ii)

*Outcomes assessed: H1.2, H4.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Provides a substantially correct definition of TEACHER as a subclass of PERSON, showing some attributes</li> </ul>	2
<ul style="list-style-type: none"> <li>Provides a definition of a sub-class TEACHER</li> </ul>	1

### Question 24 (a) (iii)

*Outcomes assessed: H1.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Explains the importance of inheritance, demonstrating an understanding of the characteristics and features, referring to the code.</li> </ul>	3
<ul style="list-style-type: none"> <li>Explains the importance of inheritance, demonstrating an understanding of characteristics and features</li> </ul> OR <ul style="list-style-type: none"> <li>Provides characteristic(s) of inheritance with some reference to the code</li> </ul>	2
<ul style="list-style-type: none"> <li>Provides a characteristic of inheritance</li> </ul> OR <ul style="list-style-type: none"> <li>Provides a relevant example</li> </ul>	1

### Question 24 (b) (i)

*Outcomes assessed: H1.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Identifies an appropriate paradigm, provides supporting argument and relates the argument correctly to the code fragment</li> </ul>	2
<ul style="list-style-type: none"> <li>Identifies an appropriate paradigm</li> </ul> OR <ul style="list-style-type: none"> <li>Identifies a characteristic of an appropriate paradigm</li> </ul>	1

### Question 24 (b) (ii)

*Outcomes assessed: H4.2*

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Provides a substantially correct evaluation showing some working</li> </ul>	3
<ul style="list-style-type: none"> <li>Provides a partial solution</li> </ul> OR <ul style="list-style-type: none"> <li>Provides a correct evaluation</li> </ul>	2
<ul style="list-style-type: none"> <li>Shows some working</li> </ul>	1

### Question 24 (c) (i)

Outcomes assessed: H2.1

#### MARKING GUIDELINES

Criteria	Marks
• Sketches in general terms the qualities of programmer productivity	2
• Identifies a quality of programmer productivity	1

### Question 24 (c) (ii)

Outcomes assessed: H2.1

#### MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of historical reasons for the development of different paradigms	3
• Provides characteristics and features of a reason for the development of different paradigms OR • Identifies reasons for the development of different paradigms	2
• Identifies a reason for the development of different paradigms	1

### Question 24 (d)

Outcomes assessed: H1.2, H4.1, H4.2

#### MARKING GUIDELINES

Criteria	Marks
• Justifies the selection of an appropriate paradigm, linking the features of the selected paradigm to the implementation of the solution to the scenario	4
• Identifies an appropriate paradigm AND • Describes a feature(s) of the selected paradigm	2–3
• Identifies a paradigm	1

### Question 25 (a) (i)

Outcomes assessed: H1.3

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Displays an understanding of place value in binary representation of integers</li> </ul>	1

Sample answer/Answers could include:

$$1 \times 1 + 1 \times 8 = 9$$

### Question 25 (a) (ii)

Outcomes assessed: H1.3

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Produces a substantially correct solution, showing an understanding of two's complement and addition</li> </ul>	2
<ul style="list-style-type: none"> <li>Shows an understanding of two's complement OR binary addition</li> </ul>	1

### Question 25 (a) (iii)

Outcomes assessed: H1.3, H4.1

#### MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> <li>Explains the importance of floating point representation, demonstrating an understanding of characteristics and features</li> </ul> AND <ul style="list-style-type: none"> <li>Provides relevant examples</li> </ul>	3
<ul style="list-style-type: none"> <li>Explains the importance of floating point representation, demonstrating an understanding of characteristics and features</li> </ul> OR <ul style="list-style-type: none"> <li>Provides relevant examples</li> </ul>	2
<ul style="list-style-type: none"> <li>Provides a basic explanation</li> </ul> OR <ul style="list-style-type: none"> <li>Provides an example</li> </ul>	1

### Question 25 (b) (i)

*Outcomes assessed: H1.1, H1.3*

#### MARKING GUIDELINES

Criteria	Marks
• Describes the movement in both directions	2
• Describes the movement in one direction	1

### Question 25 (b) (ii)

*Outcomes assessed: H1.1, H1.3*

#### MARKING GUIDELINES

Criteria	Marks
• Explains that bits need to be included for each direction to the data packet and at least 2 bits are needed for each	3
• Identifies data needed to be included in the data section of packet	2
• Identifies that bits need to be included in the packet	1

### Question 25 (c) (i)

*Outcomes assessed: H1.1, H1.3*

#### MARKING GUIDELINES

Criteria	Marks
• Identifies the purpose through identifying the main feature(s) of a flip-flop	2
• Identifies a purpose of a flip-flop	1

### Question 25 (c) (ii)

*Outcomes assessed: H1.1, H1.3*

#### MARKING GUIDELINES

Criteria	Marks
• Provides characteristics/features of the operation of a flip-flop, with reference to two inputs and two outputs	3
• Provides characteristics/features of the operation of a flip-flop	2
• Identifies a feature/characteristic of the operation of a flip flop	1



**Question 25 (d)***Outcomes assessed: H1.3***MARKING GUIDELINES**

<b>Criteria</b>	<b>Marks</b>
<ul style="list-style-type: none"><li>• Provides and justifies an equivalent circuit, using truth tables</li></ul>	4
<ul style="list-style-type: none"><li>• Demonstrates understanding of the logic AND</li></ul>	2–3
<ul style="list-style-type: none"><li>• Attempts to draw a circuit equivalent to the proposed logic</li></ul>	
<ul style="list-style-type: none"><li>• Demonstrate some understanding of the given circuit</li></ul>	1

# Software Design and Development

## 2009 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
<b>Section I</b>			
1	1	9.1.1 Social and ethical issues	H3.1
2	1	9.2.1 Defining and understanding the problem	H1.2
3	1	9.2.2 Planning and design of software solutions	H5.2
4	1	9.1.2 Application of software development approaches	H5.1
5	1	9.1.1 Social and ethical issues	H3.1
6	1	9.1.2 Application of software development approaches 9.2.2 Planning and design of software solutions	H6.1
7	1	9.2.3 Implementation of software solutions	H1.1, H1.3
8	1	9.2.3 Implementation of software solutions	H1.2
9	1	9.2.3 Implementation of software solutions	H1.2, H4.2, H4.3, H5.2
10	1	9.2.2 Planning and design of software solutions 9.3 Developing a solution package	H1.2, H5.2
11	1	9.2.2 Planning and design of software solutions 9.2.3 Implementation of software solutions 9.3 Developing a solution package	H1.3
12	1	9.2.3 Implementation of software solutions	H1.1
13	1	9.2.3 Implementation of software solutions	H1.3
14	1	9.2.2 Planning and design of software solutions	H5.2
15	1	9.2.2 Planning and design of software solutions	H4.3, H5.2
16	1	9.2.3 Implementation of software solutions	H5.2
17	1	9.2.3 Implementation of software solutions	H4.3
18	1	9.2.1 Defining and understanding the problem	H1.2, H4.2, H5.2
19	1	9.2.2 Planning and design of software solutions	H4.2
20	1	9.2.2 Planning and design of software solutions 9.2.3 Implementation of software solutions	H4.3
<b>Section II</b>			
21 (a) (i)	3	9.1.2 Application of software development approaches	H4.2
21 (a) (ii)	3	9.1.2 Application of software development approaches 9.2.3 Implementation of software solutions	H5.3, H6.3
21 (b) (i)	2	9.2.1 Defining and understanding the problem 9.3 Developing a solution package	H4.2, H5.1
21 (b) (ii)	3	9.2.1 Defining and understanding the problem	H3.1
21 (c)	3	9.2.4 Testing and evaluation of software solutions 9.3 Developing a solution package	H4.2

Question	Marks	Content	Syllabus outcomes
21 (d) (i)	1	9.1.2 Application of software development approaches 9.2.1 Defining and understanding the problem 9.2.2 Planning and design of software solutions	H1.2, H3.1, H6.1
21 (d) (ii)	2	9.1.1 Social and ethical issues 9.3 Developing a solution package	H3.1, H6.1
21 (d) (iii)	3	9.1.1 Social and ethical issues	H3.1
22 (a) (i)	1	9.2.1 Defining and understanding the problem 9.2.2 Planning and design of software solutions	H5.2
22 (a) (ii)	2	9.2.1 Defining and understanding the problem 9.2.2 Planning and design of software solutions	H5.2
22 (b) (i)	4	9.2.2 Planning and design of software solutions 9.2.3 Implementation of software solutions 9.3 Developing a solution package	H4.2, H5.2
22 (b) (ii)	2	9.2.2 Planning and design of software solutions	H6.2
22 (b) (iii)	3	9.2.2 Planning and design of software solutions	H4.2, H5.2
22 (c) (i)	4	9.2.1 Defining and understanding the problem 9.3 Developing a solution package	H5.1, H5.2
22 (c) (ii)	4	9.2.1 Defining and understanding the problem 9.3 Developing a solution package	H5.1, H5.2
23 (a) (i)	2	9.2.5 Maintenance of software solutions	H5.2
23 (a) (ii)	3	9.2.5 Maintenance of software solutions	H5.2
23 (b) (i)	2	9.2.2 Planning and design of software solutions 9.2.3 Implementation of software solutions 9.2.1 Defining and understanding the problem	H4.2, H4.3
23 (b) (ii)	2	9.2.1 Defining and understanding the problem 9.2.3 Implementation of software solutions 9.3 Developing a solution package	H4.2, H4.3
23 (b) (iii)	2	9.2.2 Planning and design of software solutions	H4.2, H4.3
23 (c) (i)	1	9.2.2 Planning and design of software solutions	H4.2
23 (c) (ii)	3	9.2.2 Planning and design of software solutions 9.3 Developing a solution package	H4.2, H4.3
23 (c) (iii)	5	9.2.2 Planning and design of software solutions	H4.2, H4.3
<b>Section III</b>			
24 (a) (i)	1	9.4.1 Evolution of programming languages	H1.2
24 (a) (ii)	2	9.4.1 Evolution of programming languages	H1.2, H4.2
24 (a) (iii)	3	9.4.1 Evolution of programming languages	H1.2
24 (b) (i)	2	9.4.1 Evolution of programming languages	H1.2
24 (b) (ii)	3	9.4.1 Evolution of programming languages	H4.2
24 (c) (i)	2	9.4.1 Evolution of programming languages	H2.1
24 (c) (ii)	3	9.4.1 Evolution of programming languages	H2.1
24(d)	4	9.4.1 Evolution of programming languages	H1.2, H4.1, H4.2
25 (a) (i)	1	9.4.2 The software developer's view of the hardware	H1.3
25 (a) (ii)	2	9.4.2 The software developer's view of the hardware	H1.3

Question	Marks	Content	Syllabus outcomes
25 (a) (iii)	3	9.4.2 The software developer's view of the hardware	H1.3, H4.1
25 (b) (i)	2	9.4.2 The software developer's view of the hardware	H1.1, H1.3
25 (b) (ii)	3	9.4.2 The software developer's view of the hardware	H1.1, H1.3
25 (c) (i)	2	9.4.2 The software developer's view of the hardware	H1.1, H1.3
25 (c) (ii)	3	9.4.2 The software developer's view of the hardware	H1.1, H1.3
25 (d)	4	9.4.2 The software developer's view of the hardware	H1.3