

2010 HSC Software Design and Development Marking Guidelines

Section I

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

Section II

Question 21 (a)

Criteria	Marks
• Identifies and describes at least TWO different areas in which an end user can contribute to the overall development of a software solution	3
• Identifies more than ONE area of involvement OR elaborates on one area of involvement	2
• Identifies an area in which an end user can be involved	1

Question 21 (b)

Criteria	Marks
• Provides justifications that demonstrate a good understanding of applying a modular approach to complex problems	3
• Provides characteristics and/or features that demonstrate some understanding of a modular approach	2
• Identifies a characteristic and/or feature of a modular approach	1

Question 21 (c) (i)

Criteria	Marks
• Briefly describes at least TWO characteristics or benefits	2
• Identifies at least ONE characteristic or benefit of using library routines	1

Question 21 (c) (ii)

Criteria	Marks
• Shows a good understanding of characteristics and at least ONE requirement of library routines relevant to the development process	3
• Shows some understanding of the characteristics of library routines relevant to the development process	2
• Shows an understanding of a characteristic of library routines	1

Question 21 (d) (i)

Criteria	Marks
• Demonstrates a superior understanding of both approaches • Identifies points for and/or against each approach, showing an understanding of the relationship between the approaches in this scenario	3
• Demonstrates a good understanding of both approaches and provides at least one point for and/or against each approach	2
• Demonstrates a clear understanding of either the RAD approach OR the prototyping approach	1

Question 21 (d) (ii)

Criteria	Marks
• Outlines the main features of at least TWO suitable forms of documentation and provides a sound justification for their use	3
• Shows a good understanding of at least TWO suitable forms of documentation	2
• Indicates the main features of ONE appropriate form of documentation OR • Identifies ONE form of documentation and provides some justification	1

Question 21 (d) (iii)

Criteria	Marks
<ul style="list-style-type: none"> Shows a good understanding of both sequential and event-driven approaches and contrasts their use in the development of this game 	3
<ul style="list-style-type: none"> Shows an understanding of both approaches and describes the use of one approach in the development of this game 	2
<ul style="list-style-type: none"> Shows an understanding of either sequential or event-driven approaches in the context of the development of this game 	1

Question 22 (a)

Criteria	Marks
<ul style="list-style-type: none"> Identifies a range of areas that need to be considered when designing test data OR <ul style="list-style-type: none"> Shows a good understanding of one area 	2
<ul style="list-style-type: none"> Identifies at least TWO areas that need to be considered OR <ul style="list-style-type: none"> Shows a basic understanding of one area 	1

Question 22 (b) (i)

Criteria	Marks
<ul style="list-style-type: none"> • Demonstrates understanding by providing a substantially correct algorithm that solves the problem, which includes: <ul style="list-style-type: none"> – Initialisation or sub-structure – Looping through successive elements of both strings – Testing for wildcard – Comparing elements of the two strings – Successful exit from loop – Identifying whether match is made 	5
<ul style="list-style-type: none"> • Demonstrates understanding by providing relevant segments of an algorithm providing a partial solution to the problem 	3–4
<ul style="list-style-type: none"> • Attempts to develop a solution to the problem by providing a relevant segment 	1–2

Question 22 (b) (ii)

Criteria	Marks
<ul style="list-style-type: none"> • Explains both outputs 	3
<ul style="list-style-type: none"> • Identifies a characteristic or feature of both outputs OR • Explains ONE output 	2
<ul style="list-style-type: none"> • Identifies a characteristic or feature of ONE output 	1

Question 22 (c) (i)

Criteria	Marks
<ul style="list-style-type: none"> Gives a substantially correct description of the problem and gives a possible solution 	3
<ul style="list-style-type: none"> Gives an adequate description of the problem and shows some understanding of the need to introduce a temporary storage variable 	2
<ul style="list-style-type: none"> Shows understanding of the problem OR <ul style="list-style-type: none"> Identifies the need for a temporary storage variable 	1

Question 22 (c) (ii)

Criteria	Marks
<ul style="list-style-type: none"> Describes the logic of insertion sort, showing understanding of major features: <ul style="list-style-type: none"> Two parts of list (sorted/unsorted) Locate the correct position Repeated process of moving each element into sorted part 	3
<ul style="list-style-type: none"> Shows some understanding of the logic of insertion sort by outlining more than one feature 	2
<ul style="list-style-type: none"> Outlines at least one feature of an insertion sort 	1

Question 22 (d)

Criteria	Marks
<ul style="list-style-type: none"> Identifies a range of techniques and provides a discussion of some techniques 	3–4
<ul style="list-style-type: none"> Identifies some techniques that can be used to make software easier to maintain. A better response will include techniques from more than one area 	1–2

Question 23 (a)

Criteria	Marks
<ul style="list-style-type: none"> Identifies appropriate project management tools and provides characteristics and features that enable these to help team members communicate and work together effectively 	3
<ul style="list-style-type: none"> Identifies an appropriate project management tool and provides characteristics and features that enable team members to communicate and work together effectively 	2
<ul style="list-style-type: none"> Identifies at least one appropriate project management tool and provides some characteristics and features 	1

Question 23 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides characteristics of the different levels of software testing, showing the interrelationship between levels 	3–4
<ul style="list-style-type: none"> Identifies characteristic(s) of different level(s) of software testing 	1–2

Question 23 (c) (i)

Criteria	Marks
<ul style="list-style-type: none"> Provides characteristics of how the load operation takes place by referring to fetching the instruction from memory to CPU as well as decoding and executing the instruction and storing the result into the register 	2
<ul style="list-style-type: none"> Recognises features of fetch-execution cycle in CPU operation 	1

Question 23 (c) (ii)

Criteria	Marks
<ul style="list-style-type: none"> Identifies the line of code that executes the fastest and provides a reason for the answer which is correct 	2
<ul style="list-style-type: none"> Identifies the line of code that executes the fastest OR identifies a relevant reason for fast execution of an instruction 	1

Question 23 (d) (i)

Criteria	Marks
<ul style="list-style-type: none"> Proposes an appropriate solution which includes separating data and using numeric values 	2
<ul style="list-style-type: none"> Identifies issue with storing comparison data as a string and provides some elaboration 	1

Question 23 (d) (ii)

Criteria	Marks
<ul style="list-style-type: none"> Shows good understanding of issues Recommends and justifies changes 	3
<ul style="list-style-type: none"> Describes issues within the design that affect usability and suggests changes that will overcome those issues 	2
<ul style="list-style-type: none"> Identifies issues within the design that affect user friendliness OR makes a suggestion for change with some justification 	1

Question 23 (d) (iii)

Criteria	Marks
<ul style="list-style-type: none"> Provides a substantially correct structure diagram including logic for: <ul style="list-style-type: none"> detecting Jane's location retrieving preferences identifying local shops identifying matching products from local shops and writing them to a list sending up final list to Jane Diagram shows data passing, appropriate flags, and decisions or repetition 	4
<ul style="list-style-type: none"> Provides a structure diagram with some modules relevant to the logic of the system. The diagram must use appropriate symbols 	3
<ul style="list-style-type: none"> Provides a diagram that shows some logic of the system and demonstrates some understanding of modules 	2
<ul style="list-style-type: none"> Provides a diagram that shows some logic of the system 	1

Section III

Question 24 (a) (i)

Criteria	Marks
• Correctly identifies the basic building blocks and gives examples from the code	2
• Correctly identifies one basic building block of the paradigm	1

Question 24 (a) (ii)

Criteria	Marks
• Correctly identifies that X would contain a list of values and correctly identifies at least three members of the list	2
• Correctly identifies one value returned for X	1

Question 24 (a) (iii)

Criteria	Marks
• Demonstrates a good understanding of backward chaining with reference to how it is applied to evaluate the query	3
• Provides at least one characteristic/feature of backward chaining and elaborates briefly on how backward chaining works in this scenario	2
• Provides at least one characteristic/feature of backward chaining	1

Question 24 (a) (iv)

Criteria	Marks
• Describes an advantage of using the logic paradigm identifying relevant features	2
• Identifies a relevant feature of the logic paradigm OR a relevant feature of the imperative approach	1

Question 24 (b) (i)

Criteria	Marks
• Correctly identifies all ATTRIBUTES and METHODS	3
• Correctly identifies at least one ATTRIBUTE and at least one METHOD	2
• Correctly identifies ATTRIBUTES or METHODS	1

Question 24 (b) (ii)

Criteria	Marks
• Correctly describes the additional attributes of Pen AND • Correctly identifies Pen as a subclass of WritingImplement	2
• Correctly describes additional attribute(s) of Pen OR • Correctly identifies Pen as a subclass of WritingImplement	1

Question 24 (b) (iii)

Criteria	Marks
• Describes characteristics of at least two features and relates these to the subclass Pencil	3
• Identifies relevant features of the OO paradigm and gives a characteristic of this use	2
• Identifies a relevant feature of the OO paradigm	1

Question 24 (b) (iv)

Criteria	Marks
• Shows a good understanding of encapsulation and illustrates understanding by reference to this scenario	3
• Gives a substantially correct definition of encapsulation	2
• Shows some understanding of the concept of encapsulation	1

Question 25 (a) (i)

Criteria	Marks
• A substantially correct solution showing an understanding of fractional representation	2
• Shows an understanding of place value in binary representation	1

Question 25 (a) (ii)

Criteria	Marks
• Performs a correct addition using binary notation including a carry digit	2
• Shows an understanding of binary arithmetic	1

Question 25 (a) (iii)

Criteria	Marks
• Gives characteristics and features of half adders and full adders which enable them in combination to carry digits in the right to left addition as described in this scenario	3
• Shows an understanding of the operation of a half adder or a full adder	2
• Provides a characteristic/feature of a half adder or full adder	1

Question 25 (a) (iv)

Criteria	Marks
• Describes an advantage of floating point representation of fractional values compared to the binary point method	2
• Identifies a relevant feature of floating point representation	1

Question 25 (b) (i)

Criteria	Marks
• Represents the condition of the system in a truth table showing a substantially correct relationship between inputs and outputs	2
• Represents the condition of the system showing different states of input and at least one appropriate output	1

Question 25 (b) (ii)

Criteria	Marks
• Designs a circuit which substantially solves the problem	3
• Draws a circuit diagram which partially solves the problem OR substantially reflects the truth table	2
• Draws a circuit diagram with at least one input and at least one appropriate circuit element	1

Question 25 (b) (iii)

Criteria	Marks
• Describes the relationship between each packet's contents and elements of the security system	3
• Shows an understanding of the relationship between bits in the packet and elements of the security system (switches, sensor, alarm)	2
• Shows some understanding of interpreting 0,1 bits in the packet	1

Question 25 (b) (iv)

Criteria	Marks
• Shows how flip flops are used to store this data, demonstrating a good understanding of the operation of a flip flop	3
• Provides a good description of the operation of a flip flop OR provides a correct but brief description of a flip flop and a valid but brief explanation of how this data could be stored	2
• Provides a characteristic or feature of a flip flop OR correctly identifies the need for four flip flops OR shows how a device activates a flip flop	1

Software Design and Development

2010 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I			
1	1	9.3 – Developing a solution package	H1.2
2	1	9.1.2 – Application of software development approaches	H1.2
3	1	9.2.2 – Planning and design of software solutions	H4.3
4	1	9.2.3 – Implementation of software solutions	H4.3, H5.2
5	1	9.1.1 – Social and ethical issues	H2.2, H3.1
6	1	9.3 – Developing a solution package	H1.2
7	1	9.2.1 – Defining and understanding the problem	H4.2, H5.2
8	1	9.2.4 – Testing and evaluation of software solutions	H4.2, H5.1
9	1	9.2.3 – Implementation of software solutions	H1.2
10	1	9.1.2 – Application of software development approaches	H1.2, H2.2
11	1	9.2.3 – Implementation of software solutions	H1.3
12	1	9.2.3 – Implementation of software solutions	H1.2, H4.2
13	1	9.2.2 – Planning and design of software solutions	H1.3, H4.2
14	1	9.2.2 – Planning and design of software solutions	H4.3
15	1	9.2.2 – Planning and design of software solutions	H4.3
16	1	9.2.1 – Defining and understanding the problem	H4.2
17	1	9.2.3 – Implementation of software solutions	H1.1, H1.3
18	1	9.2.3 – Implementation of software solutions	H1.3
19	1	9.2.3 – Implementation of software solutions	H1.1, H1.2
20	1	9.2.2 – Planning and design of software solutions, 9.3 – Developing a solution package	H1.3
Section II			
21 (a)	3	9.2 – Software development cycle	H6.1, H6.2, H6.3, H6.4
21 (b)	3	9.2.2 – Planning and design of software, 9.2.3 – Implementation of software solutions	H4.3
21 (c) (i)	2	9.2.2 – Planning and design of software solutions	H5.3, H4.2
21 (c) (ii)	3	9.2.2 – Planning and design of software solutions	H5.3, H4.2
21 (d) (i)	3	9.1.2 – Application of software development approaches	H4.2
21 (d) (ii)	3	9.2.3 – Implementation of software solutions	H5.2
21 (d) (iii)	3	9.2.2 – Planning and design of software solutions, 9.2.3 – Implementation of software solutions	H4.2, H5.3
22 (a)	2	9.2.2 – Planning and design of software solutions	H4.2
22 (b) (i)	5	9.3 – Developing a solution package, 9.2.2 – Planning and design of software solutions, 9.2.3 – Implementation of software solutions	H4.2, H4.3
22 (b) (ii)	3	9.2.2 – Planning and design of software solutions, 9.2.3 – Implementation of software solutions	H4.2, H4.3, H1.1
22 (c) (i)	3	9.2.2 – Planning and design of software solutions, 9.2.3 – Implementation of software solutions	H1.1, H1.3, H4.2
22 (c) (ii)	3	9.2.2 – Planning and design of software solutions	H4.2
22 (d)	4	9.2.5 – Maintenance of software solutions	H5.2, H4.3

Question	Marks	Content	Syllabus outcomes
23 (a)	3	9.3 – Developing a solution package	H5.3, H6.3
23 (b)	4	9.2.4 – Testing and evaluation of software solutions	H4.2
23 (c) (i)	2	9.2.3 – Implementation of software solutions	H1.3
23 (c) (ii)	2	9.2.3 – Implementation of software solutions	H1.3
23 (d) (i)	2	9.2.2 – Planning and design of software solutions	H1.3
23 (d) (ii)	3	9.2.3 – Implementation of software solutions, 9.3 – Developing a solution package	H6.4
23 (d) (iii)	4	9.2.2 – Planning and design of software solutions, 9.3 – Developing a solution package	H5.2
Section III			
24 (a) (i)	2	9.4.1 – Evolution of programming languages	H1.2
24 (a) (ii)	2	9.4.1 – Evolution of programming languages	H4.2
24 (a) (iii)	3	9.4.1 – Evolution of programming languages	H4.2
24 (a) (iv)	2	9.4.1 – Evolution of programming languages	H1.2
24 (b) (i)	3	9.4.1 – Evolution of programming languages	H4.2
24 (b) (ii)	2	9.4.1 – Evolution of programming languages	H4.2
24 (b) (iii)	3	9.4.1 – Evolution of programming languages	H4.2, H1.2
24 (b) (iv)	3	9.4.1 – Evolution of programming languages	H4.2, H1.2
25 (a) (i)	2	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
25 (a) (iii)	3	9.4.2 – The software developer’s view of the hardware	H1.3
25 (a) (iv)	2	9.4.2 – The software developer’s view of the hardware	H1.1, H4.1
25 (b) (i)	2	9.4.2 – The software developer’s view of the hardware	H1.3
25 (b) (ii)	3	9.4.2 – The software developer’s view of the hardware	H3.2
25 (b) (iii)	3	9.4.2 – The software developer’s view of the hardware	H1.3
25 (b) (iv)	3	9.4.2 – The software developer’s view of the hardware	H1.3