Class/ Index Number	Centre Number/ 'O' Level Index Number	Name
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新加坡海星中学

MARIS STELLA HIGH SCHOOL
PRELIMINARY EXAMINATION
SECONDARY FOUR

COMPUTING
Paper 1 Written

7155
25 August 2021
2 hours

Candidates answer on the Question Paper
No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use a HB pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Approved calculators are allowed.

Answer all the questions.
The number of marks is given in brackets [ ] at the end of each question or part question.
You should show all your working.
The total number of marks for this paper is 80.

For Examiner's Use
80

This document consists of **12** printed pages.

1 Xavier is concerned about security threats that he may encounter when using the Internet.

Two of the threats that he is concerned about are phishing and pharming.

(a) Give **one** similarity and **two** differences between phishing and pharming.

Similarity

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……..

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……..

.

Difference 1 ……

……..

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……..

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Difference 2 ……

……..

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……..

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[3]

(b) State **two** other threats that Xavier could encounter when using the Internet.

Threat 1 ……..……..

Threat 2 ……..……..

[2]

(c) Xavier uses a firewall to secure data on his computer.

(i) Xavier tells his classmate that a firewall can only be software-based.

Explain if you agree or disagree with him.

……

……

[1]

(ii) Describe how the firewall helps to keep Xavier's data secured.

……

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……

[4]

2 A paragraph is given about MAC addresses and IP addresses.

Complete the paragraph using the list of terms given. Not all terms need to be used.

compiled	**control**	**identify**	**principal**	**similar**
computer	**dynamic**	**packet**	**protocol**	**unique**

A MAC address is a media access …… address. A network device has a …… MAC address that can help …… the device in the network. An IP address is an Internet …… address. An IP address can be static or …… .

[5]

3 (a) Five statements are given about storage devices.

Tick (✓) to show if the statement applies to hard disk drive (**HDD**) storage or solid state drive (**SSD**) storage.

Some statements can apply to both.

Statement	HDD (✓)	SSD (✓)
It uses magnetic properties to store data		
It is non-volatile storage		
It can be used as an external storage device to back up data		
It has moving parts		
It uses flash memory to store data		

[5]

(b) Optical storage is another type of storage.

Give two examples of optical storage.

Example 1

……...

Example 2

……...

[2]

4. Joshua wants to create a simple game using the programming language he is learning.

(a) In the single-player computer game, the player has to shift brown blocks in order to create a clear path for the red block to reach the exit.

The blocks can only move in either up and down directions or left and right directions. When the player successfully drags the red block to the exit sign, a message “Level Cleared” is shown and the next puzzle is unlocked.

Players are given the choice to start from the last puzzle, choose a previously played puzzle or clear all current records and restart from the first puzzle.

Before the program is written, the problem is decomposed into smaller, more manageable parts.

Identify and describe **three** of these smaller parts.

1 ……

……...

2 ……

……...

3 ……

……...

[3]

(b) In the process of creating the game, Joshua makes several programming errors.

A logic error is one type of program error.

Identify and describe **two** other types of program error.

Error type 1 ……

Description ……..

……...

Error type 2 ……

Description ……..

[4]

5 (a) Name **and** draw the **single** logic gate that can replace the given logic circuits.

(i)

A
B
X
Name of gate: ……..
Drawing of gate:

[2]

(ii)

A
B
X
Name of gate: ……..
Drawing of gate:

[2]

(b) Complete the truth table for the given logic statement:

X = (((**A** OR **C**) AND (NOT **A** AND NOT **C**)) NOR **B**)

A	**B**	**C**	**Working space**	**X**
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		

1	1	1		

[4]

6 (a) An algorithm has been written in pseudocode to input the names and marks of 35 students. The algorithm stores the names and marks in two arrays name[] and mark[]. The highest mark awarded is calculated and the number of students with that mark is counted. Both of these values are output.

```
01  highestmark = 100
02  highestmarkstudents = 0
03  FOR count = 0 to 34
04      OUTPUT " Please enter student name: "
05      INPUT name[count]
06      OUTPUT "Please enter student mark: "
07      INPUT mark[counter]
08      IF mark[count] == highestmark
09          highestmarkstudents = highestmarkstudents - 1
10      ENDIF
11      IF mark[count] > highestmark
12          mark[count] = highestmark
13          highestmarkstudents = 1
14      ENDIF
15  NEXT
16  OUTPUT "There are ", highestmarkstudents, " with the highest mark of ",
    highestmark
```

State the line number in the algorithm where the four errors are found.
Suggest a correction for each error.

Error 1 line number ……

Correction …….....

…….....

Error 2 line number ……

Correction …….....

…….....

Error 3 line number ……

Correction …….....

…….....

Error 4 line number ……

Correction …….....

…….....

[4]

(b) Explain how you could extend the algorithm to also find the lowest mark awarded, count the number of students with that mark, and output both these values.

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[6]

7 This pseudocode represents an algorithm.

```
flag = -1
WHILE flag != 0
        flag = 0
        FOR count = 0 to 3
                IF num[count] < num[count + 1]
                        store = num[count]
                        num[count] = num[count+1]
                        num[count+1] = store
                        flag = 1
                ENDIF
        NEXT
ENDWHILE
```

(a) The contents of the array at the start of the algorithm are:

num[0]	num[1]	num[2]	num[3]	num[4]
45	56	30	12	15

Complete the trace table for the algorithm using the data given in the array.

flag	count	num[0]	num[1]	num[2]	num[3]	num[4]	store
-1		45	56	30	12	15	

[5]

(b) Describe the purpose of the algorithm.

……

……

……

……

[2]

8 Range check is an example of how programs can perform validation checks on data entered.

(a) Give the names of **two** other different validation checks and state the purpose of each.

Validation Check 1 …….....

Purpose ……..…….....

…….....

…….....

Validation Check 2 …….....

Purpose ……..…….....

…….....

…….....

[4]

(b) You are tasked to create a program to calculate the class's average score in a Computing examination.

- Prompt the user to enter the name of the class
- Prompt the user to enter the number of students in the class
- Prompt the user to key in the score of each student one at a time
- Ensure the score entered is between 0 to 80 inclusive
- If the entry is not valid, prompt the user to re-enter the score
- When all student scores have been entered, the program will calculate the class's average score
- Output the class name and the average score with appropriate message

Write an algorithm, using pseudo-code, program code or a flowchart, for the program described.

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…….....

[6]

(c) Suggest **three** different test data that can be used to test if your program in (b) works for the input of score.

Test case condition	Test data(single data input)
Normal Condition	
Boundary Condition	
Error Condition	

[3]

9 (a) Name **three** of the stages involved in the development of a program.

1 …….....

2 …….....

3 …….....

[3]

(b) Most programs are created using compilers, suggest **two** advantages of compilers over interpreters.

1 …….....

…….....

2 …….....

…….....

[2]

10 James works in a company as the IT support staff. The company has a total of 50 employees and each is supplied with a company laptop. The company has recently moved to a new building and James has been tasked to set up the company's computer network in the new building.

(a) James' first task is to obtain suitable network devices.

James intends to purchase the Network Interface Card, Router and Modem. Explain the functions of these devices.

Network Interface Card

……...

…….....
.

Router

……...

…….....
.

Modem ……...

…….....
.

[3]

(b) Within the company, data files are to be accessed by the employees to do their work. Privacy of client data is also of great importance.

Suggest if James should set up a peer to peer network or a client server network in the new building and give two reasons to justify your choice.

Type of logical topology …….

Reason 1 ……...

…….....
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Reason 2 ……...

…….....
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[3]

11 With more home based learning sessions offered, students now own their personal learning devices.

Give **two** benefits students would receive from the increased access to technology in education.

1 …….....…….....

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2 …….....…….....

……..... [2]

-End of Paper-