PATHLIGHT SCHOOL
PRELIMINARY EXAMINATION
SECONDARY 4 EXPRESS

CANDIDATE NAME									
CENTRE NUMBER	S					INDEX NUMBER				

COMPUTING 7155/01

Paper 1 Written **August 2022**

2 hours

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

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

Approved calculators are allowed.

Answer **all** 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.

1 Information stored in our computers can be susceptible to data corruption.

(a) What is data corruption?

…….……

……..…….. [1]

(b) State **three** ways in which data can become corrupted.

1 ……..…….

2 ……..…….

3 ……..…… [3]

(c) State **one** way to prevent data corruption and loss.

…….……

……. [1]

2 **(a)** Convert the hexadecimal number **A3** to denary. Show your working.

……..……

……..……

……..……

…….…….. [2]

(b) Convert the binary number **1011011** to denary. Show your working.

……..……

……..……

……..……

…….…….. [2]

(c) Convert the denary number **105** to an 8-bit binary number. Show your working.

……..……

……..……

……..……

…….…….. [2]

3 A company uses spreadsheet software to monitor its monthly sales. The company records:

- each sale that is transacted
- whether the Goods and Sales Tax (GST) is inclusive (absorbed by the company).

	A	B	C	D	E	F
1	**Date**	**Sales**	**GST inclusive?**		**GST rate:**	7%
2	7-Jan-2022	$ 5,000.00	No			
3	8-Jan-2022	$ 6,300.00	Yes			
4	9-Jan-2022	$ 1,000.00	Yes			
5	10-Jan-2022	$ 3,500.00	No			
6	11-Jan-2022	$ 8,000.00	No			
7						
8				Total sales:		
9				Sales with GST-inclusive:		7300
10				Sales to charge GST on:		

(a) Identify the **most appropriate** data type for the data in the following cell references:

Cell	Data type
A1	
A2	
B3	
F1	

[4]

(b) The cell **F8** will calculate the total sales.

Identify the function that will need to be entered into **F8**.

…… [1]

(c) The cell **F9** will calculate the total for the sales that are GST-inclusive.
The company uses one function to calculate this value.

Describe the formula that will need to be entered in cell **F9**.

……

……

……

……

…… [3]

4 Six types of security threats are on the left, and seven descriptions on the right.

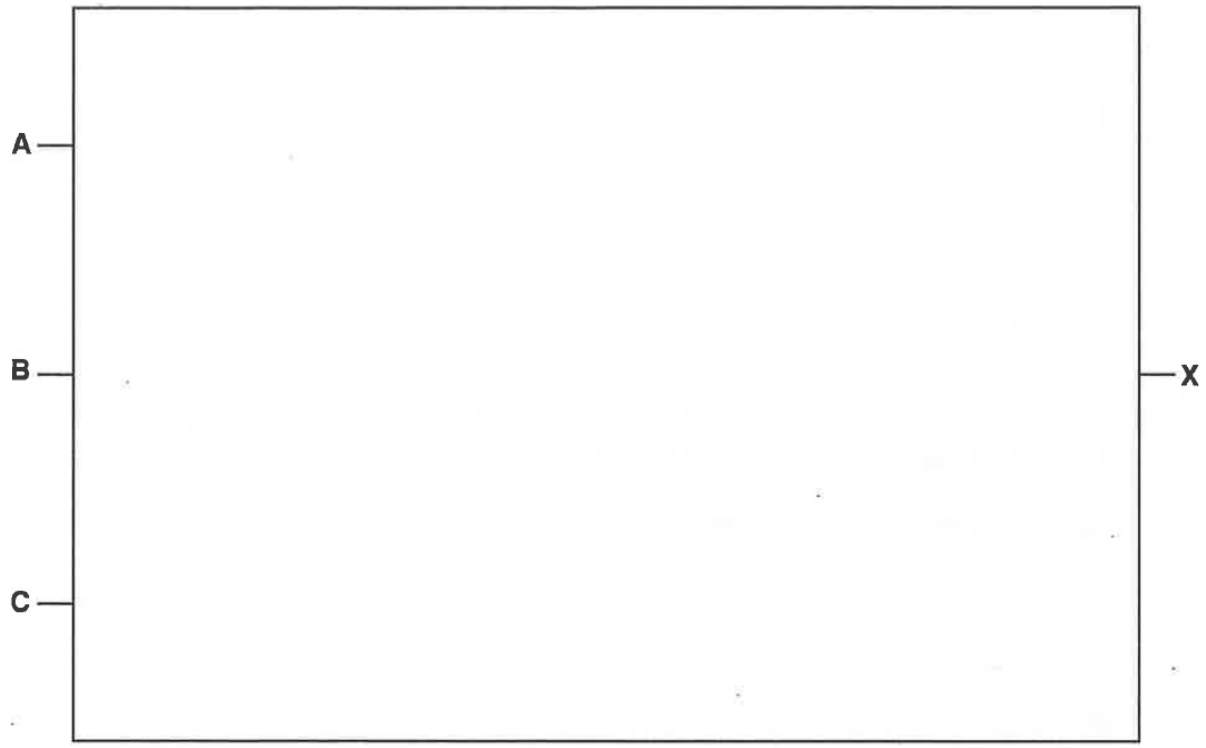
Draw **one** line to link each security threat to its correct description.

Security Threat	Description
Cookie	A computer program that pretends to be a harmless file or useful application
Pharming	A small file used by websites to store personal information on a user's web browser
Phishing	A computer program that attaches itself to a normally harmless program and modifies it
Spamming	The use of emails and fake websites that appear to be from reputable companies in order to steal personal information such as passwords and credit card numbers from users
Trojan Horse	The mass distribution of unwanted messages or advertising to email addresses collected from sources such as public mailing lists, social networking sites, company websites and blogs
Virus	The use of data owned by someone by someone else, such as an intruder, without permission
	The interception of requests sent from a computer to a legitimate website and redirection to a fake website to steal personal data or credit card details

[6]

5 **(a)** Draw the logic circuit to represent the following Boolean statement. Do **not** simplify the statement.

X = ((**A** AND **B**) AND (**A** OR NOT **C**)) OR (**B** AND NOT **C**)



[6]

(b) Complete the truth table for the Boolean statement:

X = ((**A** AND **B**) AND (**A** OR NOT **C**)) OR (**B** AND NOT **C**)

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 Ashley is setting up a home network. There are two desktop computers that use a wired connection. There are three wireless devices: one laptop, one tablet and one mobile phone.

(a) The home network has a router, but does not have a switch.

(i) A router and a switch are examples of network hardware.
Give **one other** feature that is the same in both a switch and a router, and **one** difference.

Feature that is the same …….

…….

Difference ……....

…….. [2]

(ii) Identify **and** describe the function of **one other** network device that could be part of the home network.

Device …..……..

Function ……..

……..
[2]

(b) Tick (✓) **one** box to indicate whether Ashley's home network is a LAN or a WAN.

Give reasons for your choice.

LAN	
WAN	

Reasons

…….

…….

…….

…….

……..…..… [3]

7 The following algorithm compares whole numbers between 0 and 10 (inclusive).

```
01   Count = 0
02   WHILE Count < 3 DO
03      INPUT Number1
04      INPUT Number2
05      IF Number1 > Number2 THEN
06         OUTPUT "Win"
07      ELSE
08         IF Number1 == Number2 THEN
09            OUTPUT "Draw"
10         ELSE
11            OUTPUT "Lose"
12         ENDIF
13      ENDIF
14      Count = Count + 1
15   ENDWHILE
```

(a) The algorithm is tested using the following numbers as input:

`7,2,4,4,6,8,10`

Complete the following trace table for the algorithm.

Count	Number1	Number2	OUTPUT

[4]

(b) (i) The algorithm does not include validation for input.
Name **and** describe **one** validation check that could be added to validate the input.

……

……

……

…… [2]

(ii) Name **two** different validation checks other than your answer to part **(b)(i).**

1 ……

2 …… [2]

(c) Once complete, the algorithm is tested with data for normal conditions.

Identify **two other** test case conditions that could be used to test the algorithm.

For **each** test case condition, give an example of test data for this algorithm.

Test case condition	Test data

[4]

8 Alex has created a computer program which he has intended for his personal use.
However he would also like to protect his creative work to prevent others from copying it.

Complete the following paragraphs by filling in the missing words.

Creative works that have value but can exist purely as data with no physical form are known as …… …… .

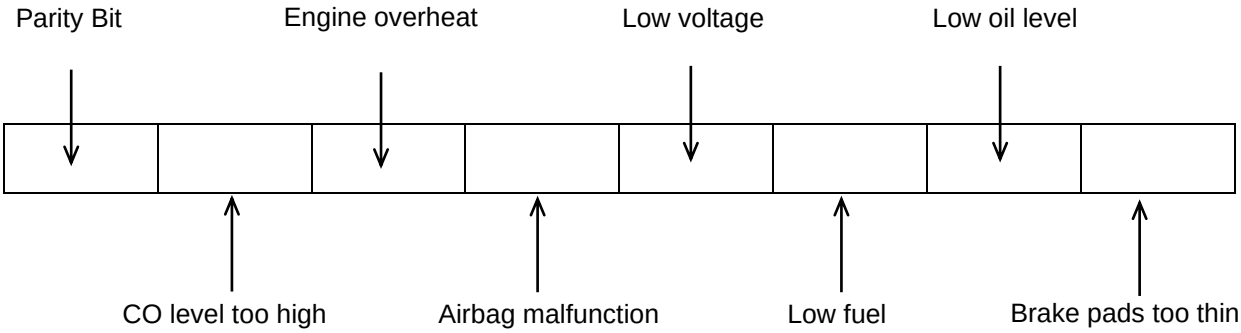
Owners of such works can grant a …… to authorise for use under certain conditions.

Software where the legal protections have either expired or are inapplicable are known as …… …… software.

…… is when a person passes off someone else's original work as one's own.

[4]

9 A bus company uses an Engine Management System (EMS) for maintaining its fleet of buses. The EMS receives information from seven different sensors and stores the status of each sensor in an 8-bit register. A value of **1** indicates a faulty condition.



For example, a register showing **10110100** indicates:

- Engine overheating
- Airbag malfunction
- Low fuel

(a) Identify the faulty condition(s) that the following register indicates:

1	**0**	**0**	**0**	**1**	**1**	**0**	**1**

.....

.....

.....

[2]

(b) The system uses **even** parity.

Write the correct parity bit in each of the following registers.

	1	**1**	**1**	**0**	**0**	**1**	**0**

	0	**1**	**0**	**1**	**0**	**1**	**0**

[2]

(c) State the hexadecimal value of the binary number shown in **(a)**.

.....

[1]

10 An algorithm has been written in pseudo-code that inputs 20 numbers and outputs how many numbers are within the range 20 and 50 inclusive and how many numbers are outside the range.

```
01  WithinRange = 999
02  OutsideRange = 0
03  FOR Count = 1 to 20
04     OUTPUT "Enter number"
05     INPUT number
06     IF number >= 20 OR number <= 50 THEN
07        WithinRange = WithinRange + 1
08     ELSE
09        OutsideRange = OutsideRange – 1
10     ENDIF
11  NEXT Y
12  OUTPUT WithinRange, OutsideRange
```

There are **four** errors in this pseudo-code algorithm.

State each error **and** write the correct pseudo-code.

Error 1 ……

Correction ……

……

Error 2 ……

Correction ……

……

Error 3 ……

Correction ……

……

Error 4 ……

Correction ……

……

[8]

11 A small cafe sells four types of items: bun (50 cents), coffee ($1.20), cake ($1.50) and sandwich ($2.10).

You are required to write a program for the cashier system that does the following:

- inputs the items sold and the quantity for every transaction during the day
- uses the string “end” to finish the day’s input
- adds up the daily amount earned for each type of item
- outputs the total earnings (for all items) at the end of the day
- outputs the type of item that has the highest earnings at the end of the day.

(a) State the inputs, outputs and processes required for the program.

Inputs ……..

……..

……..

Outputs ……..

……..

……..

Processes required ……..

……..

……..

[3]

(b) Write an algorithm, using pseudo-code or a flowchart, to create the program required in the question. You will need to include checks to ensure that only valid items are input.

……

……

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……

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……

……

.... [6]

END OF PAPER

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