2022 PRELIMINARY EXAMINATION
Secondary 4 Express
Computing Paper 1

ANSWERS AND MARKING SCHEME

1 (a) data corruption

Data corruption occurs when computer data is made unusable by errors or alterations. [1]

(b) any **three**:
- Human error
- Power failure
- Hardware failure or damage
- Malicious software [3]

(c) perform regular backups [1]

2 (a) $\mathbf{A3_{16}}$
$= 1010\ 0011_2$
$= 1 \times 2^7 + 1 \times 2^5 + 1 \times 2^1 + 1 \times 2^0$ [1]
$= 128 + 32 + 2 + 1$
$= 163_{10}$ [1]

(b) $\mathbf{1011011_2}$

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

$= 1 \times 2^6 + 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^1 + 1 \times 2^0$ [1]
$= (64 + 16 + 8 + 2 + 1)_{10}$
$= \mathbf{91_{10}}$ [1]

(c) $\mathbf{105_{10}}$
$= 2^6 + 2^5 + 2^3 + 2^0$ [1]

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

$= 0110\ 1001_2$ (must be 8 bits) [1]

3 (a)

Cell	Data type
A1	Text
A2	Date
B3	Currency
F1	Percentage

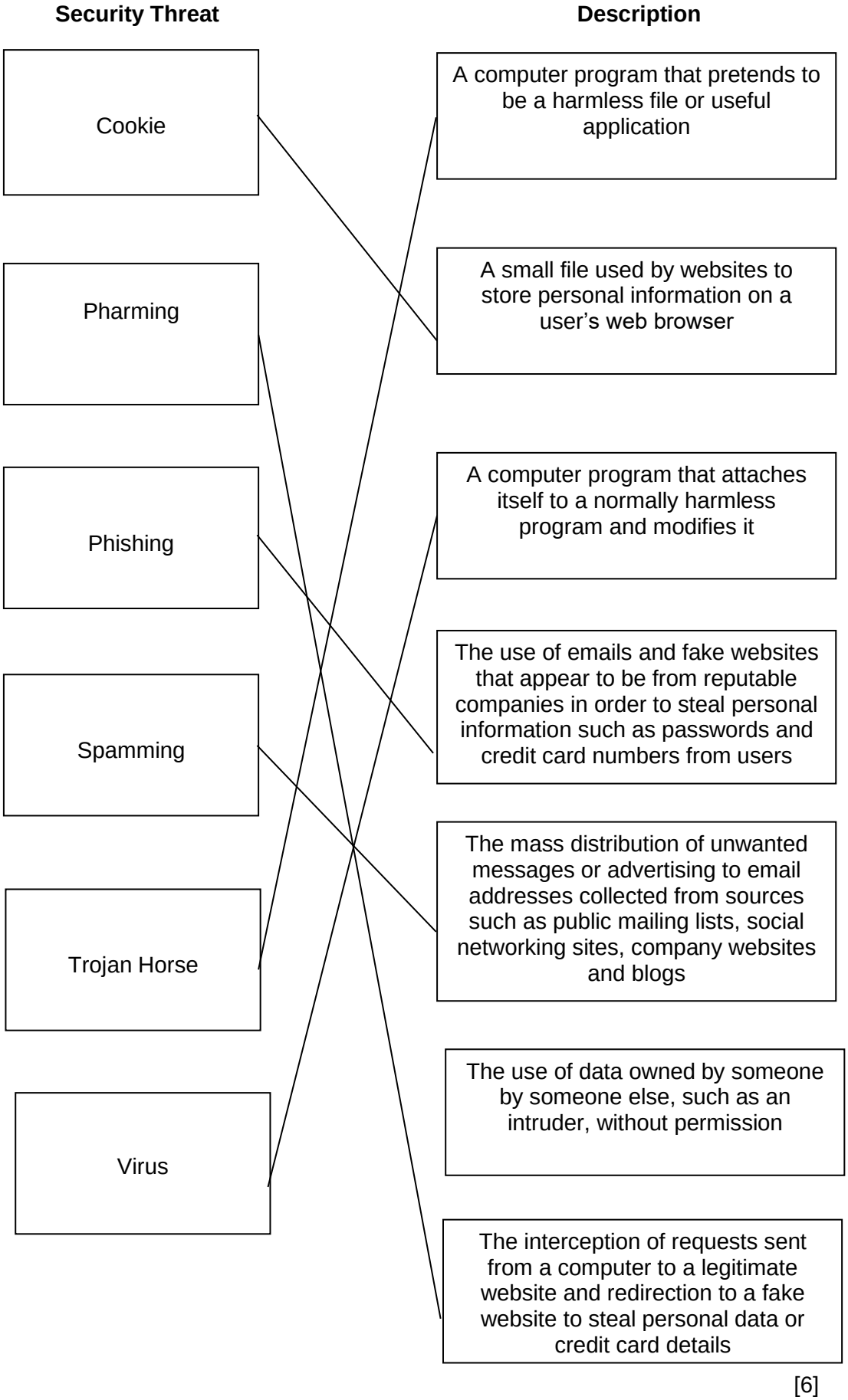
[4]

(b) G8 =SUM(B2:B6) [2]

(c) SUMIF(C2:C6,"Yes",B2:B6) [1]

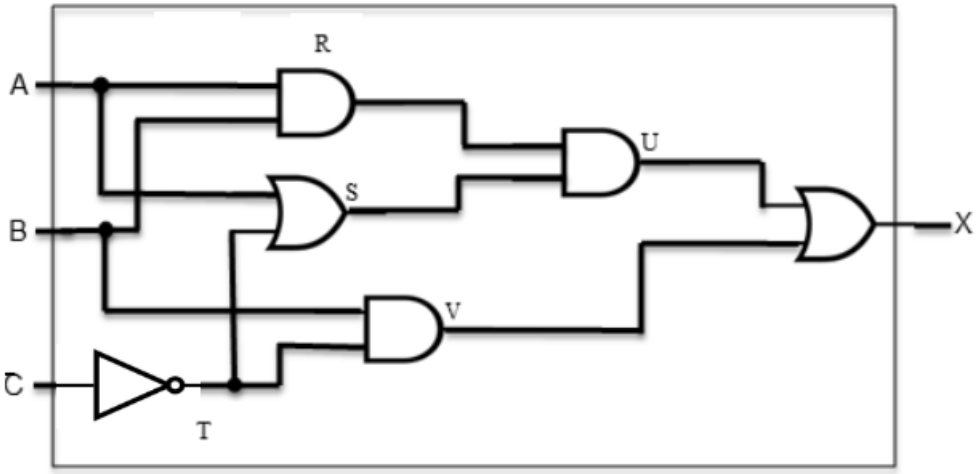
The function is entered with 3 arguments, first the range where the criteria is contained is selected, then the criteria is entered, in this case "Yes", then the sum range of cell is selected. The function then returns the sum of the corresponding cells that meet the criteria, in this case, cells B3:B4. [2]

4


Security Threat
Description
Cookie
Pharming
Phishing
Spamming
Trojan Horse
Virus
A computer program that pretends to be a harmless file or useful application
A small file used by websites to store personal information on a user's web browser
A computer program that attaches itself to a normally harmless program and modifies it
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
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
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) 5 marks for correct logic gates used, 1 mark for correct output.



[6]

5 (b) 4 marks for correct output for X (1 mark for each pair of correct output).

A	B	C	Working Space R	S	T	U	V	X
0	0	0	0	1	1	0	0	0
0	0	1	0	0	0	0	0	0
0	1	0	0	1	1	0	1	1
0	1	1	0	0	0	0	0	0
1	0	0	0	1	1	0	0	0
1	0	1	0	1	0	0	0	0
1	1	0	1	1	1	1	1	1
1	1	1	1	1	0	1	0	1

[4]

6 (a) router and switch

(i) Similarity:

Both router and switch are both network connecting devices used to connect devices in a LAN [1]

Difference:

While a switch combines multiple similar networks that use the same protocol into a single network, a router keeps the connected networks (which may use fundamentally different protocols) separate and forwards packets between them using Internet protocols. [1]

(ii) Another device (1 mark for naming, 1 mark for describing the function):

Network interface card:

A network interface controller (NIC) provides the hardware interface to enable the transfer of data between a device and a network.

Network Hub:

Used to connect multiple devices to the same network; it transmits received packets to all connected devices

Modem:

When setting up Internet access in a home network, an ISP will typically provide a modem that sets up a long-distance connection to the ISP's network. [2]

(b) Ashley's home network is a LAN. It is within a building (his home and covers a small geographical area. [3]

7 (a)

(i) **Trace Table:**

Count	Number1	Number2	OUTPUT
0	7	2	
			Win
1	4	4	
			Draw
2	6	8	
			Lose
3			

[4]

(b) (i) Range check

- to check that user has entered numbers greater than zero [2]

(ii) Format check

Presence check [2]

(c)

Test case condition	Test data
Boundary condition	0, 10
Error condition	Any reasonable test data: -1, twelve, three

1 mark each for test case condition identified, 1 mark each for test data [4]

8

Creative works that have value but can exist purely as data with no physical form are known as ……intellectual…… ……property…… .[1m]

Owners of such works can grant a ……licence……[1m]…… to authorise for use under certain conditions.

Software where the legal protections have either expired or are inapplicable are known as ……public…… ……domain…… software.[1m]

……Plagiarism…[1m]…… is when a person passes off someone else's original work as one's own.

[4]

9(a) There are 3 faulty conditions:

- low fuel, low voltage and the brake pads are too thin. [2]

(b) Write the correct parity bit in each of the following registers (even parity).

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

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

[2]

(c) 8D [1]

10 One mark for each error identified and one mark for matching correction

Line	Error	Correction
01	`WithinRange = 999`	`WithinRange = 0`
06	`IF number >= 20 OR number <= 50 THEN`	`IF number >= 20 AND number <= 50 THEN`
10	`Count = Count + 1`	Not needed here
11	`NEXT Y`	`NEXT Count`

[8]

11

(a) input – item(type of item), quantity of item (1mark)
output – total earnings, item with the highest earning (1mark)
process – check input item, add cost to counter, repeat checking input item and adding cost to counter till “end” is entered, compare cost to find highest earning(max 2 marks)

[3]

(b) Marking points (any six):

– 1 mark for complete initialisation
– 1 mark for correct loop structure (could be while – end while or do – until loop.)
– 1 mark for correct input of item INSIDE the loop
– 1 mark to check on which item has been input
– 1 mark for correct *summation of value of each item input
– 1 mark to check if each item total is the largest value
– 1 mark for variable (e.g. x) takes on the highest total value
– 1 mark for total value of ALL four totals
– 1 mark for correct output OUTSIDE the loop

Sample coding:

```
x,tbun, tcoffee, tcake, tsand =0,0,0,0,0
item = “”
highest = “”
WHILE item != “end”
        INPUT item
        INPUT quantity
        IF item = “bun” THEN
            tbun = tbun + 0.5* quantity
        ELSEIF item = “coffee” THEN
            tcoffee = tcoffee + 1.20* quantity
        ELSEIF item = “cake” THEN
            tcake = tcake + 1.50* quantity
        ELSEIF item = “sandwich” THEN
            tsand = tsand + 2.10* quantity
        ELSE
            OUTPUT “error”
        ENDIF
ENDWHILE
IF tbun > x THEN
   x = tbun, highest=”bun”
IF tcoffee > x THEN
    x = tcoffee, highest =”coffee”
IF tcake > x THEN
   x = tcake, highest =”cake”
IF tsand > x THEN
   x = tsand, highest = “sandwich”
total = tbun + tcoffee + tcake + tsand
OUTPUT “Total Earnings is “, total
OUTPUT “Highest Earning item is “, highest
```

[6]