Serangoon Secondary Computing
Sec 4E
2022 Preliminary Exams (Marking scheme)

1. (a)

Cell	Data type
A1	String / Text [1m]
A3	Date [1m]
C6	Currency [1m]
D4	String / Text [1m]

(b) SUM [1m]

(c) = SUMIF(D2:D6 , “credit card” , C2:C6)

use of =SUMIF [1m]
correct range for evaluation and criteria [1m]
correct range for summation [1m]

2. (a)

A cyberattack is an unwelcomed attempt to steal, expose, alter, disable or destroy information through unauthorised access to computer systems. It is usually carried out over a network such as the ……Internet [1m]…… .

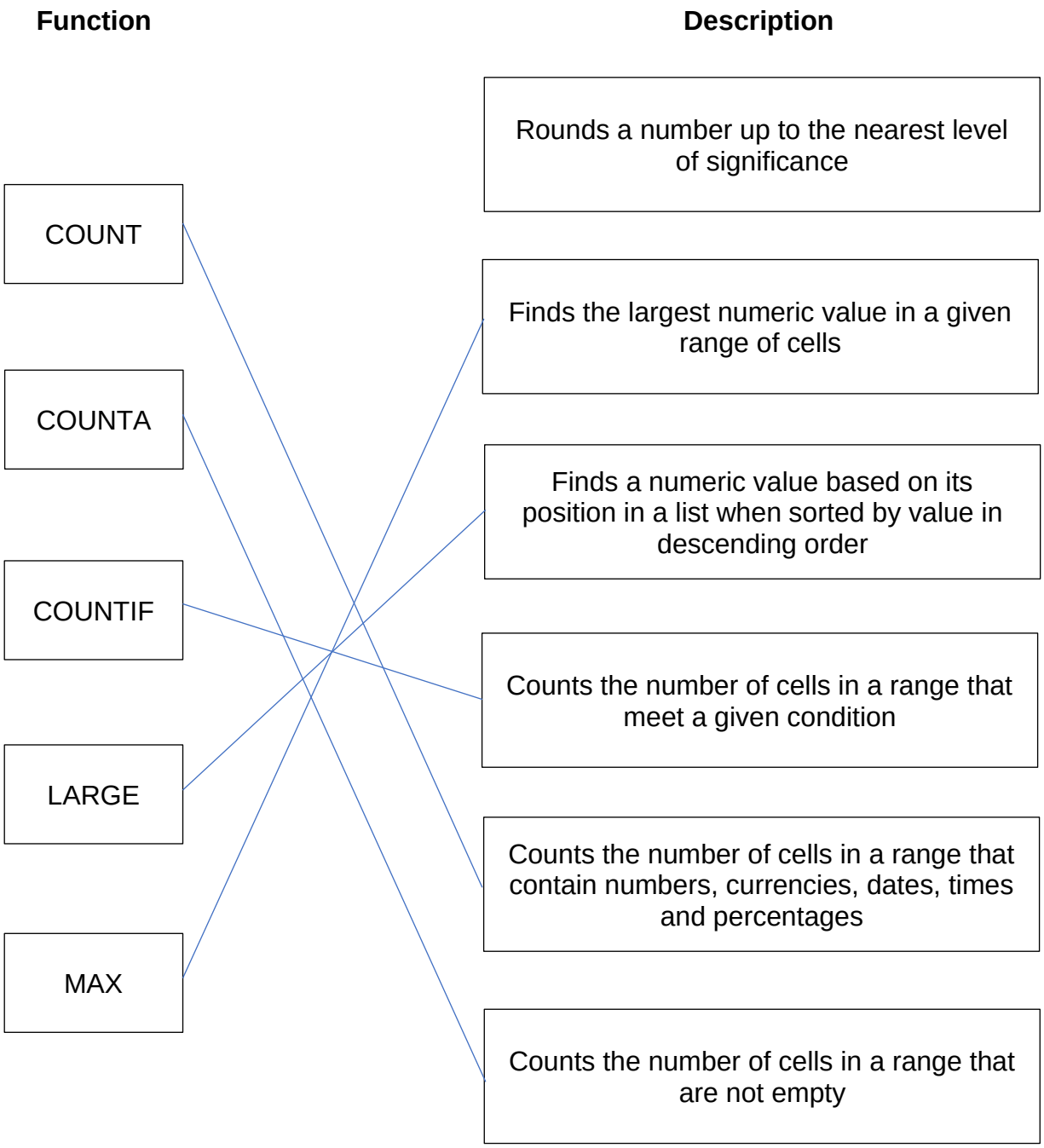
One type of cyberattack is ……Trojan-horse [1m]…… This is a type of malware that downloads onto a computer disguised as a ……harmless [1m]…… program and attacks a computer by enabling intruders to open backdoors for unauthorised access to the computer.

A second type of cyberattack is ……phishing [1m]…… . This is a form of social engineering attack which sends fraudulent communications that appear to come from ……reputable [1m]…… sources in order to steal personal information such as passwords and credit cards numbers from users.

(b)

Problem	Effect	Preventive measure
Power failure	Any one of: • Data corruption if data is in the midst of being save • Data lost if data has not been saved [1m]	Any one of: • Set up of backup power supply or UPS (**U**ninterrupted **P**ower **S**upply) • Make regular backups of data [1m]
Human error	Any one of: • Accidental deletion or over-writing of data. • Accidental damage to storage medium (e.g. transport or spillage of water) [1m]	Any one of: • Set up of file sharing rules and rights • Adequate protection to storage medium (e.g. avoid eating/drinking near devices, and protection during transport • Make regular backups of data. [1m]
Hardware failure	Any one of: • Data corruption due to hardware failure of storage device • Data loss due to hardware failure of storage device [1m]	Any one of: • Check storage devices regularly and replace them when signs of failure are detected • Use of redundancy storage solutions such as RAID systems • Make regular backups of data [1m]

3.



[1m] for each correct line

4. (a) (i) Feature that is the same [1m]
Any one from:
- Connects 2 or more devices together to allow them to communicate with each other.
- Has ports to connect LAN cables

Difference [1m]
Any one from:
- Switches connect multiple similar networks together, but routers allow separate networks with different protocols to communicate with each other.
- Switches forward data packets to a device's MAC address, but routers forward data packets to a device's IP address.

(b) Belinda's home network is a ……LAN……[1m]

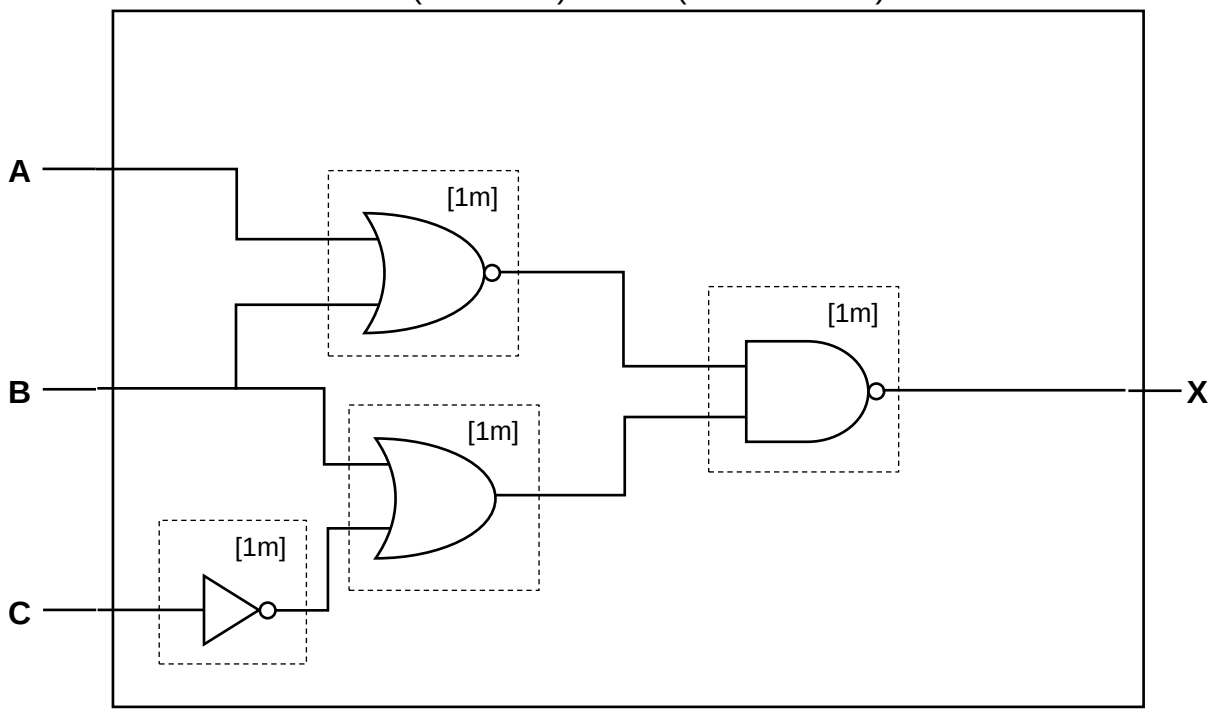
Reasons ([1m] for each correct point):
- Devices connected within a small area
- Small number of devices connected on the network

5. (a)

Truth table	Correct or incorrect	Correct solution (where needed)	
A | **B** | **A AND B** 0 | 0 | 0 0 | 1 | 1 1 | 0 | 1 1 | 1 | 1	incorrect	**A** | **B** | **A AND B** 0 | 0 | 0 0 | 1 | 0 1 | 0 | 0 1 | 1 | 1	[1m]
A | **B** | **A NAND B** 0 | 0 | 1 0 | 1 | 1 1 | 0 | 1 1 | 1 | 0	correct	**A** | **B** | **A NAND B** 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |	[1m]
A | **B** | **A NOR B** 0 | 0 | 0 0 | 1 | 0 1 | 0 | 0 1 | 1 | 1	incorrect	**A** | **B** | **A NOR B** 0 | 0 | 1 0 | 1 | 0 1 | 0 | 0 1 | 1 | 0	[1m]

(b)

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



Note: marks will be awarded only if correct gate **and** correct inputs/output are drawn

(c)

A	**B**	**C**	**Working space**			**X (D NAND F)**
			D (A NOR B)	**E (NOT C)**	**F (B OR E)**	
0	0	0	1	1	1	0
0	0	1	1	0	0	1
0	1	0	0	1	1	1
0	1	1	0	0	1	1
1	0	0	0	1	1	1
1	0	1	0	0	0	1
1	1	0	0	1	1	1
1	1	1	0	0	1	1
			[1m]	[1m]	[1m]	[1m]

6. (a)

Stage	Letter
1	*A*
2	*C*
3	*D*
4	**E**
5	*B*

1 to 2 correct: [1m]
3 correct: [2m]
4 correct: [3m]

(b) Any 2 from: [1m] each
- Technique of breaking down a complex problem or process into smaller parts called sub-problems
- Each sub-problem is more manageable and easier to understand
- Sub-problems can be solved individually and combined to solve the original problem
- Incremental and modular approaches

(c) Any one from: [1m]
- Sensing a swipe action of the touchscreen panel from a start point to an end point
- Determine the direction of swipe by the user on the touchscreen panel
- Generating graphics to show a change of direction of movement of the game character

(d) Freeware
Any 2 from: [1m] each
- Proprietary software
- Available for use at no cost
- Illegal to copy and modify **source codes**
- Legal to copy and distribute freeware

Open-source software
Any 2 from: [1m] each
- Freedom of use of the software. Users may still need to pay to use open-source software
- Users are free to change, copy, study and share software and its source codes
- Conditional for users to maintain open-source licensing, and attribution given to original authors for any derivatives from the original source.

(e) Open courseware [1m]

7. (a) All 4 in any order from:
   - Error: Line 4 [1m]
     Correction: `WHILE Num != 0` [1m]
   - Error: Line 10 [1m]
     Correction: `Flag[Count] = TRUE` [1m]
   - Error: Line 17 [1m]
     Correction: `IF Flag[Count] == TRUE THEN` [1m]
   - Error: Line 18 [1m]
     Correction: `OUTPUT Large[Count]` [1m]

   (b) All 2 in any order from:
   - Error type: Syntax error [1m]
     Description: Errors due to incorrect source code, such as spelling mistakes or wrong use of symbols, that fail to follow rules of the language. [1m]
   - Error type: Run-time error [1m]
     Description: Errors that are only detected while a program is running; usually caused by erroneous data or the wrong use of commands which causes the program to crash or hang. [1m]

   (c)

Test case condition	Test data
Normal	5 (or any other integer number) [1m]
	0 [1m]
Error	TRUE [1m]
	"Five" [1m]
	Or any other acceptable answer

   (d) Debugging technique: Use of intermittent print statements [1m]
   Description: Any one from: [1m]
   - Adding print statements to display values of variables
   - Adding print statements in a loop to observe change of variable values as a loop repeats

8. One mark for each (max of 7 marks):
   - Input a number and initialize to a variable (number to be guessed)
   - Management of while loop
   - …… that repeats until a correct answer is given
   - Input player's guess in every loop
   - Checks if player's guess is larger than answer
   - …… and outputs an appropriate message when guess is larger than answer
   - Checks if player's guess is smaller than answer
   - …… and outputs an appropriate message when guess is smaller than answer
   - Outputs "You win!" when the correct answer is given by the player
   - Outputs the number of guesses

   Possible algorithm:

```
OUTPUT "Please enter a number for player to guess: "
INPUT ANS
WHILE TRUE:
    OUTPUT "Guess the number: "
    INPUT GUESS
    IF GUESS < ANS THEN
        OUTPUT "Number too small. Guess a larger number."
    ELSE IF GUESS > ANS THEN
        OUTPUT "Number too larger. Guess a smaller number."
    ELSE:
        OUTPUT "You win!"
        BREAK
END WHILE
```