JUNYUAN SECONDARY SCHOOL
PRELIMINARY EXAMINATION 2019
SECONDARY FOUR EXPRESS

CANDIDATE NAME

CLASS

INDEX NUMBER

COMPUTING

7155/01

Paper 1

3 Sep 2019

Candidates answer on the Question Paper.

2 hours

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number 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 or graphs.
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**.

For Examiner's use

1 **(a)** A computer has 2048 MB of RAM.

How many GB of RAM does the computer have?
Show your working.

.....

.....

.....

.....GB [2]

(b) Describe **one** item that is stored in RAM.

.....

.....

..... [2]

(c) Explain **two** ways that RAM is different to ROM.

1.....

.....

.....

2.....

.....

..... [2]

2 **Five** security terms and **six** statements are listed below.

Draw a line to match the security term with the most appropriate statement.

Security term	Statement
	Gathers information by monitoring key presses on a user's keyboard; the information is relayed back to the originator of the software.
Cookie	
	Provides a secure connection between web browsers and websites allowing secure transmission of private data.
Pharming	
	Uses rules and criteria, set by the user, to help protect a network or system from unauthorised access.
Phishing	
	Legitimate-looking email is sent in the hope of gathering personal information; it requires the user to click.
Spyware	
	A message given to a web browser by a web server; it is stored in a text file; the message is then sent back to the server each time the browser requests a page from the server.
Firewall	
	Malicious code installed on the hard drive of a user's computer; this code will redirect the user to a fake website without the user's knowledge.

[5]

3 Match the **three** descriptions below using the following list of types of software.

Open courseware	Freeware	Free and open source software
Proprietary software	Shareware	

	Description	**Type of Software**
(a)	Users can download this software free of charge, but they cannot modify the source code in any way.	
(b)	Users can study the software source code and modify it, where necessary, to meet their own needs, without breaking copyright laws.	
(c)	Users can obtain a free trial version of the software, but this often does not contain all the features of the full version.	

[3]

4 Hexadecimal codes are used in MAC addresses.

(a) State what is meant by the term MAC.

..... [1]

(b) Explain what the hexadecimal code in a MAC address represents.

.....

.....

.....

.....

.....

..... [2]

5 **(a)** Convert the following **two** hexadecimal numbers into binary:

F A 7
D 3 E

[4]

(b) Now perform the **AND** (logic) operation on each corresponding pair of binary bits in the two numbers from **part (a)**.

[2]

(c) Convert your answer in **part (b)** into hexadecimal.

.....

..... [2]

(d) Hexadecimal numbers are often used by computer programmers to represent binary values.

Explain why computer programmers may choose to use hexadecimal numbers.

.....

.....

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..... [2]

6 A greenhouse uses a system to monitor the conditions that plants need to grow.

The inputs to the system are:

Input	Binary value	Condition
W	1	Window is open
	0	Window is closed
T	1	Temperature >=26 °C
	0	Temperature <26 °C
H	1	Humidity >=50%
	0	Humidity <50%

The system will sound an alarm when certain conditions are detected.

Alarm (**X**) will sound (=1) when:

window is closed and temperature >=26 °C

or

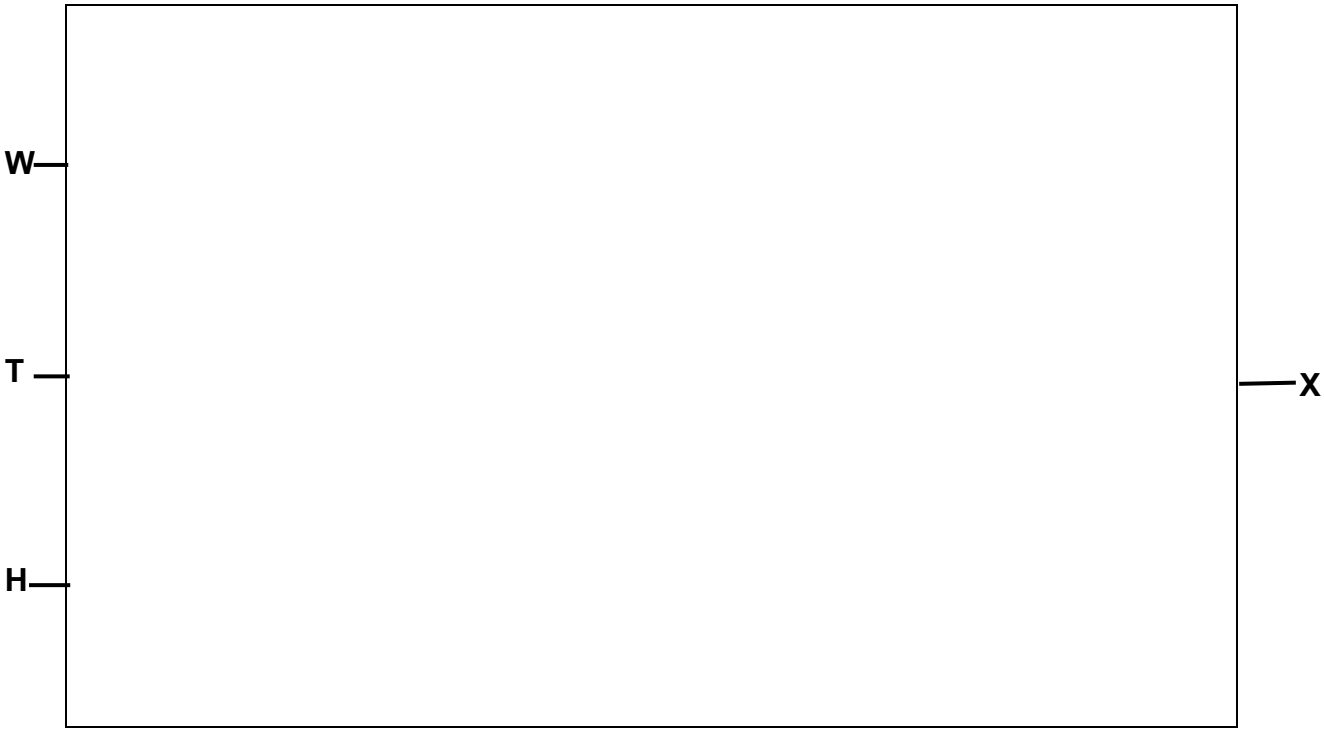
temperature <26 °C and humidity >=50%

(a) Write a Boolean statement that matches the description of the logic required.

X = ……..……...

……..… [2]

(b) Draw a logic circuit to represent the monitoring system.



[5]

(c) Complete the truth table for the monitoring system.

Input			Working space	Output
W	**T**	**H**		**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]

7 A pseudo-code algorithm:

- allows a user to input 10 numbers
- checks whether each number is between 10 and 20, both exclusive
- totals and outputs the numbers within the range and outside the range

```
1     InRange = 0
2     OutRange = 1000
3     FOR Count = 1 TO 10
4     INPUT Num
5           IF Num > 10 AND Num < 20 THEN InRange = InRange + 1
6                 ELSE OutRange = OutRange - 1
7     NEXT X
8     OUTPUT InRange, OutRange
```

There are **three** errors in the given algorithm.

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

Error 1 Line number.....

Correction.....

……..…….

Error 2 Line number.....

Correction.....

……..…….

Error 3 Line number.....

Correction.....

……..…….

[6]

8 State which types of storage device would be most suitable for these scenarios.

For each device, give a reason for your choice.

(a) Storing applications on a tablet device.

Device: .....

Reason: .....

..... [2]

(b) Storing a 1200 MB high-definition promotional movie about a new car. The movie is to be given to people who are interested in buying a new car.

Device: .....

Reason: .....

..... [2]

9 Harry is planning to create a computer game using a high-level programming language.

(a) State why the computer needs to translate the code before it is executed.

.....

..... [1]

(b) Harry can use either a complier or an interpreter to translate the code.

Describe **two** differences between how a complier and an interpreter would translate Harry's computer game.

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..... [4]

10 Parity checks can be used to check for errors during data transmission. The parity bit is often the leftmost bit in the byte.

(a) A system uses even parity. Write the appropriate parity bit for each byte of data.

Parity Bit							
	1	0	1	0	0	1	1
	1	0	1	1	1	1	1
	1	0	1	0	0	0	1

[2]

(b) A parity check can often detect corruption of a byte.

Describe a situation in which it **cannot** detect corruption of a byte.

…….....

...….....

…..... [1]

(c) State **one** other method that could be used to check for transmission errors.

...…..... [1]

11 Check digits are used to ensure the accuracy of input data.

A 7-digit code number has an extra digit on the right, called the check digit.

Digit position	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Digit	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

The check digit is calculated as follows:

- each digit in the number is multiplied by its digit position
- the seven results are then added together
- this total is divided by 11
- the remainder gives the check digit (if the remainder = 10, the check digit is X)

(a) Calculate the check digit for the following code number. Show all your working.

4 2 4 1 5 0 8 …

….....

….....

….....

Check digit..... [2]

(b) An operator has just keyed in the following code number:

3 2 4 0 0 4 5 X

Has the operator correctly keyed in the code number?

…….....

Give a reason for your answer.

.....

.....

…….....

……..... [3]

12 Andrew has a spreadsheet to keep track of the number of members in his CCA Club. He records down their names and student IDs. The first character of the ID represents the gender of the student while the second to fifth character represent the year they are born in.

	A	B	C	D	E	F	G
1		Today's date:	16/7/2019		Number of Boys	4	
2		Year	2019		Number of Girls	3	
3							
4	**S/No.**	**Name**	**Student ID**	**Gender**	**Year of Birth**	**Age**	
5	1	Andrew Simmons	M20051233	M	2005	14	
6	2	Catherine Lim	F20030089	F	2003	16	
7	3	Balakrishnan	M20040988	M	2004	15	
8	4	Charlotte Koh	F20041092	F	2004	15	
9	5	Tammy Wong	M20050291	M	2005	14	
10	6	Ahmad Ibrahim	M2006423	M	2006	13	
11	7						
12	8						

(a) The cell **D5** shows the gender for Andrew Simmons.

Identify the most efficient function to use in cell **D5**.

……..…….. [1]

(b) The cell **E5** shows the year of birth for Andrew Simmons.

Identify the most appropriate function to use in cell **E5**.

……..…….. [1]

(c) The formula in cell F1 calculates the number of boys in the club.

Identify the most appropriate function to use in cell **F1**.

……..…….. [1]

(d) Cell **F5** shows the current age of Andrew Simmons.

What formula must be in cell **F5** to calculate the current age?

……..…….. [1]

13 **(a)** A college decides to use network computers with wireless capability.

Give **two** advantages and **one** disadvantage of a wireless network as compared to a wired network.

Advantage 1.....

.....

..... [1]

Advantage 2.....

.....

…..... [1]

Disadvantage.....

.....

..... [1]

(b) Devices in a network can be organised in either a client-server or peer-to-peer network.

Give **two** advantages and **one** disadvantage of client-server networks as compared to peer-to-peer networks.

Advantage 1.....

.....

..... [1]

Advantage 2.....

.....

…..... [1]

Disadvantage.....

.....

..... [1]

14 The algorithm allows a number to be entered. It then calculates and outputs the next number in the mathematical series.

```
Fib = 1
Prev2 = 0
Prev1 = 1
INPUT Number
IF Number = 0
     THEN Fib = 0
ENDIF
WHILE Number > 2
     Fib = Prev2 + Prev1
     Prev2 = Prev1
     Prev1 = Fib
     Number = Number - 1
ENDWHILE
OUTPUT Fib
```

Complete the trace table for the input data: **7**

Fib	Prev2	Prev1	Number	OUTPUT

[4]

15 Write an algorithm, using pseudocode or a program flowchart only, that

- inputs fifty numbers each as 4 separate digits, for example: **1 5 4 1**
- outputs the percentage of numbers that were palindromes.

(note: a palindrome reads the same way backwards or forwards. For example, 1331 is a palindrome but 1541 is not).
Use separate variables to store the separate digits of a number (for example D1, D2, D3, D4).

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[4]

End of Paper

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