Name_____ (   )   Class: Sec _____

SERANGOON SECONDARY SCHOOL

PRELIMINARY EXAMINATION 2018

SECONDARY 4 EXPRESS

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COMPUTING	**7155/01**
PAPER 1	**24 Aug 2018**
Name of Setter:	**2 hours**

READ THESE INSTRUCTIONS FIRST

Do not open the question papers until you are told to do so.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs, music or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
No marks will be awarded for using brand names of software packages or hardware.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

FOR EXAMINER'S

80

This question paper consists of 12 printed pages.

1   Draw a line between the description and the correct spreadsheet function.

Description   **Function**

Use to retrieve the nth lowest number from a set of numbers

n^{th}

MODE

Returns the most repeated number in a set of numbers

SMALL

CEILING

Returns number rounded up to a given multiple

ROUND

[3]

2   (a) Convert the binary number **10110101** into a denary number. Show your workings.

………………………………………………………………………………………………

………………………………………………………………………………………….........

…………………………………………………………………………………………….. [2]

(b) Convert the hexadecimal number **F8** into a binary number. Show your workings.

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…………………………………………………………………………………………….. [2]

(c) Convert the denary number **250** into a hexadecimal number. Show your workings.

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…………………………………………………………………………………………….. [2]

3   (a) A bank needs to keep its customers' data safe and secure. Unauthorised access can happen due to poor authentication, access control and privacy policy.

For each cause of unauthorised access, give:

(i)   a description of the cause
(ii) how it can be prevented
(iii) explain how the cause can affect the integrity of data

Authentication

(i)   Description: ……………………………………………………………………………...

…………………………………………………………………………………………………

(ii) Prevention: …………………………………………………………………………………

…………………………………………………………………………………………………

(iii) Integrity of data: ……………………………………………………………………...

…………………………………………………………………………………………………

Access control

(i)   Description: ……………………………………………………………………………...

…………………………………………………………………………………………………

(ii) Prevention: …………………………………………………………………………………

…………………………………………………………………………………………………

(iii) Integrity of data: ……………………………………………………………………...

…………………………………………………………………………………………………

Privacy policy

(i)   Description: ……………………………………………………………………………...

…………………………………………………………………………………………………

(ii) Prevention: …………………………………………………………………………………

…………………………………………………………………………………………………

(iii) Integrity of data: ……………………………………………………………………...

…………………………………………………………………………………………………

[9]

4   Five statements about interpreters and compilers are shown in the table below.

Study each statement.

Tick (✓) to show whether the statement refers to an interpreter or to a compiler.

Statement	Interpreter	Compiler
takes one statement at a time and executes it		
generate an error report at the end of translation of the whole program		
stops the translation process as soon as the first error is encountered		
slow speed of execution of program loops		
translates the entire program in one go		

[5]

5   Insert **three** of the following words about computer architecture in the correct place in the text below.

processor	motherboard	ROM	CPU
bus	input	Hard disk	RAM

A ……………….. is used to transfer bits of data between the different components found

on the …………….. One such component is the ………………… , which stores the

instructions to start-up the computer.   [3]

6   Identify a different network device other than a hub, for each of the scenario below. In each case explain the function of the device.

(a) A hub is used to connect three computers in a network at home. The network does not need access to the internet.

Device 1…………………………………………………………………………………………

Function …………………………………………………………………………………………

…………………………………………………………………………………………………

…………………………………………………………………………………………………

(b) A local area network of thirty computers in a building which does not need access to the internet.

Device 2…………………………………………………………………………………………

Function …………………………………………………………………………………………

…………………………………………………………………………………………………

…………………………………………………………………………………………………

(c) A local area network which needs to access the internet.

Device 3…………………………………………………………………………………………

Function …………………………………………………………………………………………

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…………………………………………………………………………………………………

[9]

7   (a) Describe **three** differences between an IP address and a MAC address.

1 …………………………………………………………………………………………………..

…………………………………………………………………………………………………

2 …………………………………………………………………………………………………..

…………………………………………………………………………………………………

3 …………………………………………………………………………………………………..

……………………………………………………………………………………………… [3]

(b) Odd parity bit is used in the following data transfer between the sender and receiver.

The 8th bit is the parity bit.

Sender

1	2	3	4	5	6	7	8
0	1	1	0	1	0	1	1

Receiver

1	2	3	4	5	6	7	8
0	0	1	0	1	0	1	1
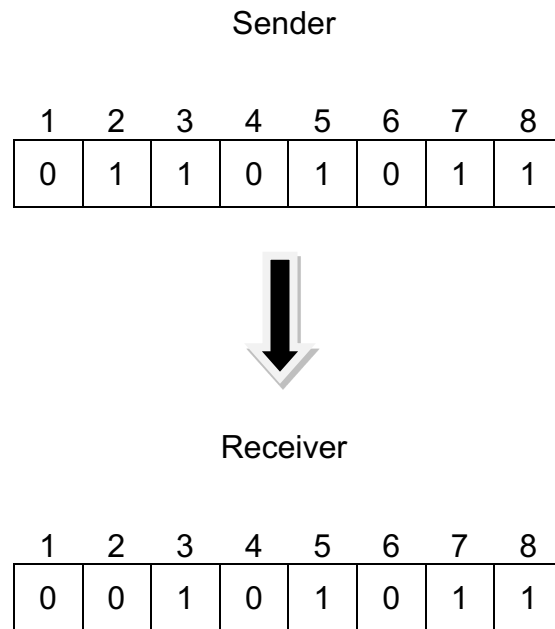
State the function of the parity bit.

………

……………………………………………………………………………………………………[1]

(c) What has happened in the above data transfer?

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…………………………………………………………………………………………………….....

……………………………………………………………………………………………………[2]

(d) Give one limitation of the parity bit used in the above data transfer.

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……………………………………………………………………………………………………[1]

8   Audrey wants to purchase a particular mobile phone model, which is sold at three different shops. Each shop is offering the phone at different selling prices and different discounted rates.

State the inputs, the outputs and the processes required to find the shop that sells the phone at the lowest cost.

Inputs ……………………………………………………………………………………………………...

……..

Outputs …………………………………………………………………………………………………

……..

Processes required ……………………………………………………………………………………

……..

……………………………………………………………………………………………… [6]

9   (a) An algorithm input thirty positive numbers and then output the smallest number input.

```
1 Small = 0
2 Counter = 0
3 REPEAT
4   INPUT Num
5   IF Num < Small THEN Num = Small
6   Counter = Counter + 1
7   PRINT Small
8 UNTIL Counter < 30
```

There are **four** errors in this pseudo-code. Locate the errors and state the correct pseudo-code.

Error 1 ……………………………………………………………………………………………
Correction …………………………………………………………………………………………...

……...

Error 2 ……………………………………………………………………………………………
Correction …………………………………………………………………………………………...

……...

Error 3 ……………………………………………………………………………………………
Correction …………………………………………………………………………………………...

……...

Error 4 ……………………………………………………………………………………………
Correction …………………………………………………………………………………………...

……………………………………………………………………………………………… [8]

(b) The thirty positive numbers are to be printed in the reverse order that it was input.

(i) State by providing a reason, what needs to be done to the input variable `Num` in order to do this.

………………………………………………………………………………………….....

………………………………………………………………………………………….. [2]

(ii) Show how the input statement at line 4 would be modified to do this.

……………………………………………………………………………………… [2]

10 An alarm, Y, sends a signal when certain fault conditions in a chemical process are detected. The inputs are:

Input	Binary value	Condition
A	1	acidity > 5
	0	acidity <= 5
T	1	temperature >= 120°C
	0	temperature < 120°C
S	1	stirrer bar ON
	0	stirrer bar OFF

The alarm, Y, return a value of 1 if:

either   temperature >= 120°C AND stirrer bar is OFF
or   acidity > 5 AND temperature < 120°C

(a) Draw the logic circuit for the system.   [5]

(b) Complete the truth table for the system.

A	T	S	Working Space	Y
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]

11   The flowchart inputs the size of a number of car engines; a value of –1 stops the input.
     This information is output: average engine size and number of engines with size > 1.5

START

Engine = 0
Count = 0
Number = 0

INPUT Size

Size = -1?

Yes

No

Average = Engine/Number

OUTPUT
Average,
Count

END

Size > 1.5?

Yes

No

Count = Count + 1

Number = Number + 1

Engine = Engine + Size
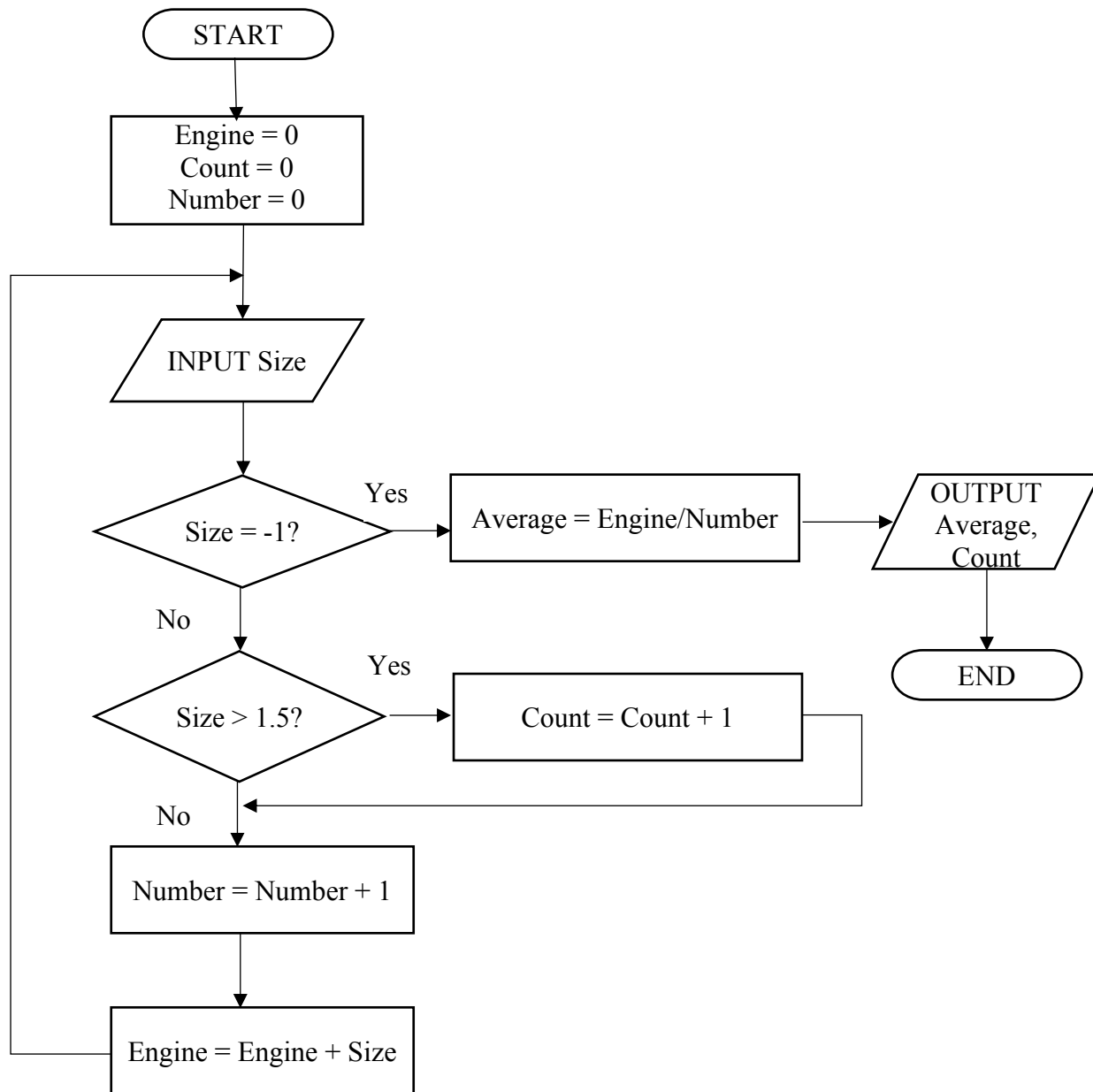
Complete the trace table for the input data.

1.8, 2.0, 1.0, 1.3, 1.0, 2.5, 2.0, 1.3, 1.8, 1.3, −1

Engine	Count	Number	Size	Average	Output

[6]

12 The manufacturing cost of producing an item depends on its complexity. A company manufactures three different types of items, with costs based on the following calculations:

Item type 1: item cost = parts cost * 1.5
Item type 2: item cost = parts cost * 2.5
Item type 3: item cost = parts cost * 5.0

The company makes 1000 items per day.

Write an algorithm, using pseudocode, flowchart or otherwise, which
- inputs the item type and parts cost of each item
- outputs the item cost for each item
- calculates and outputs the average item cost per day

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....[5]

END OF PAPER