



TONBRIDGE SCHOOL

Test for Entrance into Year 12 in September 2020

Computer Science

Name:

School:

Time allowed : 45 min

Total Marks : 55

Answer all SEVEN questions in the spaces provided on the question paper

- No calculators allowed.
- You are advised to spend the first 5 minutes reading through the paper and the remaining 40 minutes to answer questions
- In all questions the marks given for each part reflect how many separate points you are expected to make in your answer.

1. (a) **Four** pseudocode descriptions and **five** pseudocode statements are shown. Draw one line to link each pseudocode description to the correct pseudocode statement. Not all pseudocode statements will be used.

| Pseudocode description | Pseudocode statement |
|---|---------------------------------|
| A loop that will iterate at least once. | FOR...TO...NEXT |
| A conditional statement to deal with many possible outcomes. | IF...THEN...ELSE...ENDIF |
| A loop that will iterate a set number of times. | WHILE...DO...ENDWHILE |
| A conditional statement with different outcomes for true and false. | CASE...OF...OTHERWISE...ENDCASE |
| | REPEAT...UNTIL |

[4]

(b) Read this section of program code that:

- Inputs 10 numbers
- Checks whether each number is within a specified range
- Totals 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    Count = Count + 1
8  NEXT X
9  PRINT InRange, OutRange

```

There are four errors in this code. Locate these errors and suggest a correction to remove each error.

Error 1.....

Correction.....

Error 2.....

Correction.....

Error 3.....

Correction.....

Error 4.....

Correction.....

[4]

Qu.2 continued

(b) The size of the batch has increased to 50 sacks. It has been decided to only reject sacks that are underweight.

State the changes that need to be made to the flowchart.

.....
.....
.....
.....

[2]

3. MP3 file compression reduces the size of a music file by 90%

(a) A music track is 80MB in size.

Calculate the file size after compression.

.....

How many MP3 files of the size calculated above could be stored on an 800MB CD?

.....

[2]

(b) (i) Explain how MP3 files retain most of the original music quality.

.....
.....
.....
.....
.....

[2]

(ii) State the type of compression used in MP3 files.

.....

[1]

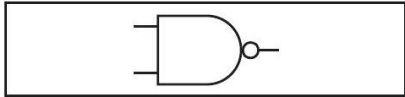
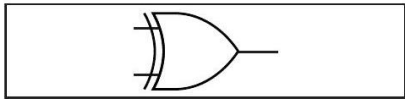
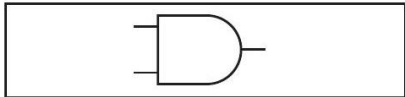
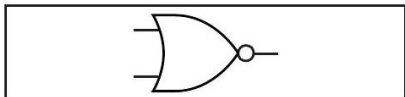
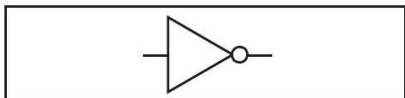
(iii) Name another file compression format.

.....

[1]

4. (a) The diagram below shows five logic gate symbols and five names.

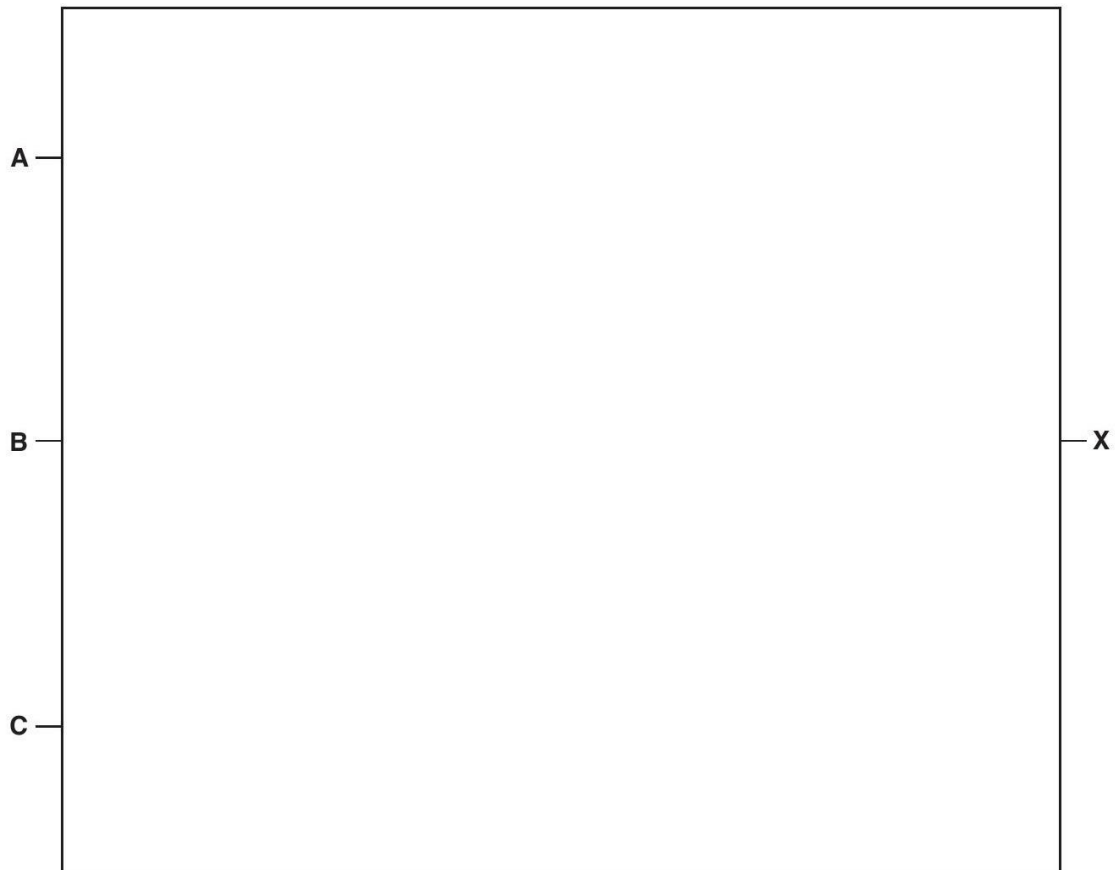
Draw a line between each logic gate symbol and its correct name

| Logic Gate Symbol | Name |
|---|------|
|  | AND |
|  | NOT |
|  | NOR |
|  | XOR |
|  | NAND |

[4]

(b) Draw a logic circuit to represent the logic statement:

$X = 1$ if (A is NOT 1 AND B is 1) AND (A is NOT 1 AND C is NOT 1) OR (B is 1 AND C is 1)



[7]

5. (a) Three statements about cookies are shown below. Study each statement.

Tick (✓) to show whether the statement is true or false.

| Statement | True | False |
|--|------|-------|
| Cookies can destroy or modify data in a computer without the user's knowledge | | |
| Cookies generate website pop-ups | | |
| Cookies allow a website to detect whether a viewer has viewed specific web pages | | |

[3]

(b) Two features of Von Neumann architecture are the use of registers and the use of buses. Give the names of **two** registers and **two** buses.

Registers

1.....

2.....

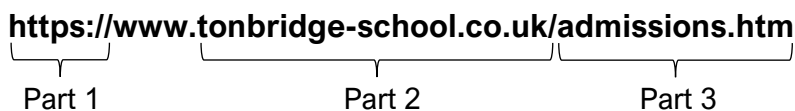
Buses

1.....

2.....

[4]

6. (a) An example of a Uniform Resource Locator (URL) is:



Identify the three parts that make up this URL.

Part 1.....

Part 2.....

Part 3.....

[3]

(b) Describe what is meant by an IP address.

.....

[4]

7. A washing machine has a small display screen built into it.

One use of the display screen is to show an error code when a problem has occurred with a washing cycle.

(a) State whether the display screen is an **input, output** or **storage device**

.....
[1]

(b) The display screen shows a hexadecimal error code:

E04

This error code means that the water will not empty out of the washing machine.

Convert this error code to binary.

| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|

[3]

(c) State why hexadecimal is used to display the error code.

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

(d) Identify a sensor that could be used in the washing machine.

State what the sensor could be used for.

Sensor.....

Use.....
.....

[3]