Track 3

FORM 3	**COMPUTING**	**TIME: 1h 30min**

Name: _____   **Class:** _____

Directions to Candidates:

> *Answer **ALL** questions in **Section A** and **Section B** on this paper;*
> *The use of flow chart template is permitted;*
> *Calculators are **NOT** allowed;*
> *Good English and orderly presentation are important.*

For office use only:

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Paper Total	Course Work	Final Mark
Max	5	5	5	5	5	5	5	5	5	5	5	15	15	85%	15%	100%
Mark																

Section A – Answer ALL Questions

1. Give the **term** for each of the following statements:
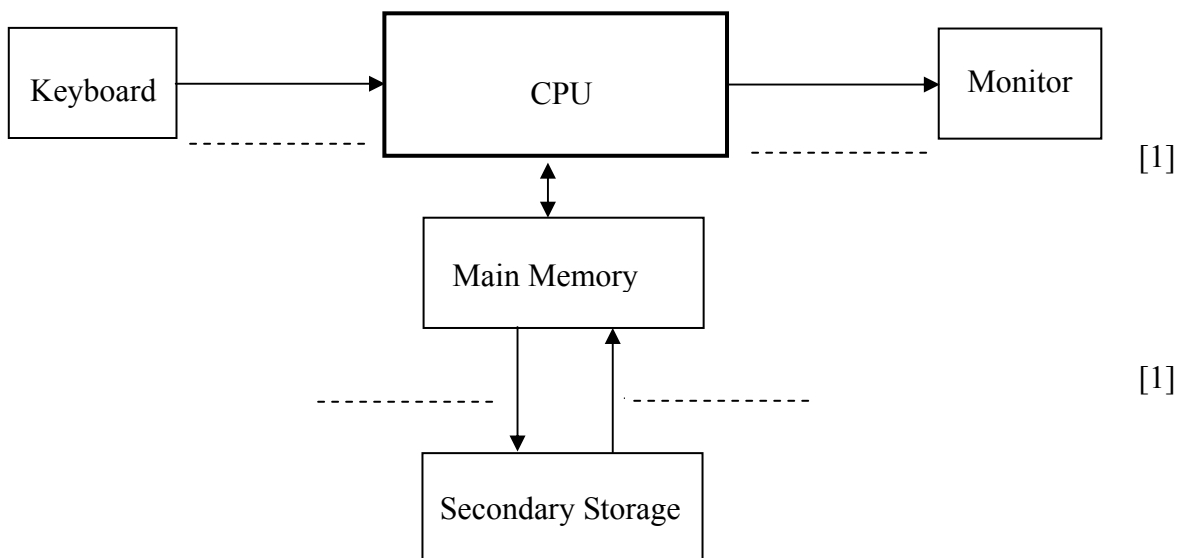
a.	A very small 2-state hardware item that can either output a 1 or a 0.		[1]
b.	A pointing device found on portable computers (e.g. laptops and notebooks).		[1]
c.	A temporary storage area that acts as a waiting area for data that is being transferred to a slow device.		[1]
d.	A magnetic storage device that is the main form of backing (secondary) store in most computer systems.		[1]
e.	A vector output device useful in producing large graphical images such as maps.		[1]

2. There are seven basic functions of a computer system. One such function is the **processing** of data.

    a. Four other basic functions of computer systems are:

    > **output, retrieve, save, input**

    Label the diagram below with these four functions by writing one function on the appropriate dotted line.

    ```
    +----------+         +-------------+         +----------+
    | Keyboard |  ---->  |     CPU     |  ---->  | Monitor  |
    +----------+         +-------------+         +----------+
              - - - - -        |  ^        - - - - -           [1]
                               v  |
                        +-------------+
                        | Main Memory |
                        +-------------+
                              |  ^
              - - - - -       |  |      - - - - -               [1]
                              v  |
                        +-----------------+
                        | Secondary Storage |
                        +-----------------+
    ```

    b. List the **other two basic functions** of a computer system (besides the five mentioned above).

    i. _____   ii. _____ [2]

    c. Give one **advantage** of computerizing a manual stock control system in a shop.

    _____

    _____ [1]

3. A local supermarket is automating its bill production system.

   a. Suggest an **input device** for quickly entering the product's details.

   _____ [1]

   b. Write down two **advantages for the customer** in using the device you mentioned in part 'a' above.

   i. _____ [1]

   ii. _____ [1]

   c. Suggest a possible **limitation** of the device mentioned in part 'a' above.

   _____ [1]

   d. The supermarket is issuing loyalty cards to its customers. Interested customers have to complete a form with their details and then return it to the cashier. Mention a document reader that could be used by the supermarket to **directly digitize** the data in these forms.

   _____ [1]

4. Give one **typical use** for each of the following devices. *The first one has been done as an example.*

   a. Graphics tablet   *Inputting architectural plans.*

   b. LCD projector _____ [1]

   c. Laser printer _____ [1]

   d. Digital camera _____ [1]

   e. Braille printer _____ [1]

   f. Eye sensor reader _____ [1]

5. This question is about the **quality** of an image on the screen or printer output.

   a. What do you understand by the **resolution** of the screen/printer and what **term/unit** is used to measure it?

   Resolution: _____ [1]

   Term/Unit: _____ [1]

   b. An image has a resolution of 160 by 80 and 8-bit colour representation.

   i. How many **pixels** make up this image on a screen?

   _____ [1]

   ii. What do you understand by the term **'8-bit colour representation'**?

   _____
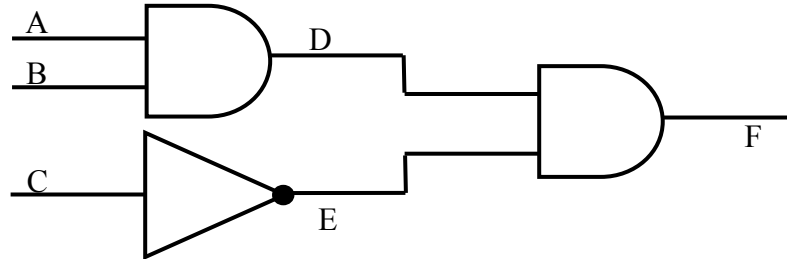
   _____ [1]

   iii. How many **bytes** are needed to store this image?

   _____ [1]

6. Logic gates have a major role to play inside a computer system.

   a. Mention one **use** of logic gates in a computer system.

   _____ [2]

   b. Study the following logic circuit and then complete its **truth table** below.

A	B	C	D	E	F
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

[3]

7. Utility software may either come as pre-packed (bundled) with an Operating System or bought separately off-the-shelf.

   a. What is **utility** software?

   _____

   _____ [2]

   b. Mention the **utility software** that is used for:

i.	Detecting, locating and removing viruses.		[1]
ii.	Removing all existing information on a disk and preparing it for re-use.		[1]
iii.	Improving disk access speed by arranging parts of the same files near each other.		[1]

8. Decimal, binary and hexadecimal are three number systems studied during Computing lessons.

   a. What is the **base** of the hexadecimal number system?

   _____ [1]

   b. Which of the three number systems mentioned above, is the one that is **actually used** by the hardware of a computer system?

   _____ [1]

c. Complete the following table to show the **numbers** given in decimal, hexadecimal or binary as indicated. Clearly show your working.

Binary	Decimal
11010	Answer _____

[1]

Decimal	Hexadecimal
57	Answer _____

[1]

Hexadecimal	Binary
1A	Answer _____

[1]

9. a. The following is a screenshot from a Spreadsheet application.

	A	B	C	D	E	F	G
1							
2			**Family Budget Yearly Summary**				
3							
4			Income	Expenditure	Money Saved	Percentage Saved	
5		January	€ 1,280.50	€ 932.40	€ 348.10	27.18%	
6		February	€ 1,080.50	€ 954.40	€ 126.10	11.67%	
7		March	€ 990.50	€ 939.70	€ 50.80	5.13%	
8		April	€ 950.50	€ 932.40	€ 18.10	1.90%	
9		May	€ 1,180.50	€ 875.30	€ 305.20	25.85%	
10		June	€ 980.50	€ 784.30	€ 196.20	20.01%	
11		July	€ 1,250.50	€ 1,235.50	€ 15.00	1.20%	
12		August	€ 1,000.50	€ 932.40	€ 68.10	6.81%	
13		September	€ 999.50	€ 866.90	€ 132.60	13.27%	
14		October	€ 1,340.50	€ 932.40	€ 408.10	30.44%	
15		November	€ 1,980.50	€ 894.30	€ 1,086.20	54.84%	
16		December	€ 1,780.50	€ 999.20	€ 781.30	43.88%	
17							
18		Total	€ 14,815.00	€ 11,279.20	€ 3,535.80		
19		Average	€ 1,234.58	€ 939.93	€ 294.65	20.18%	
20							

i. Write the **formula** that was typed in the following two cells. *Full marks are awarded if you use the correct built-in function in your formula.*
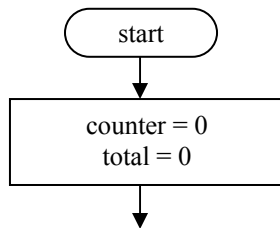
Cell C19: _____   Cell E18: _____   [2]

ii. Suggest an **advantage** of representing the numeric data in the spreadsheet in a graph/chart.

_____ [1]

b. Mention and briefly explain the **word processing feature** that allows the user to use spreadsheet data to create a personalized invitation for 200 people.

_____

_____

_____ [2]

10. Complete the following **flowchart**. The algorithm of the flowchart is to accept the total rainfall in mm every day for a month and then output the average rainfall for that month.
(Remember that not all months have the same number of days, so you should:
   i. _use a counter to count the number of days in the month;_
   ii. _allow the user to exit the entry of rainfall by inputting '999')._
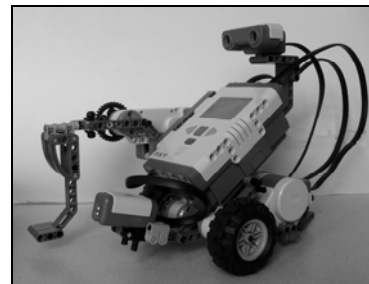

[5]

11. The Internet has various applications in the business world.

    a. Mention one **advantage** of using e-mail for business communication.

        _____ [1]

    b. Suggest two other **uses** (except email) of the Internet in the business world.

        i. _____ [1]

        ii. _____ [1]

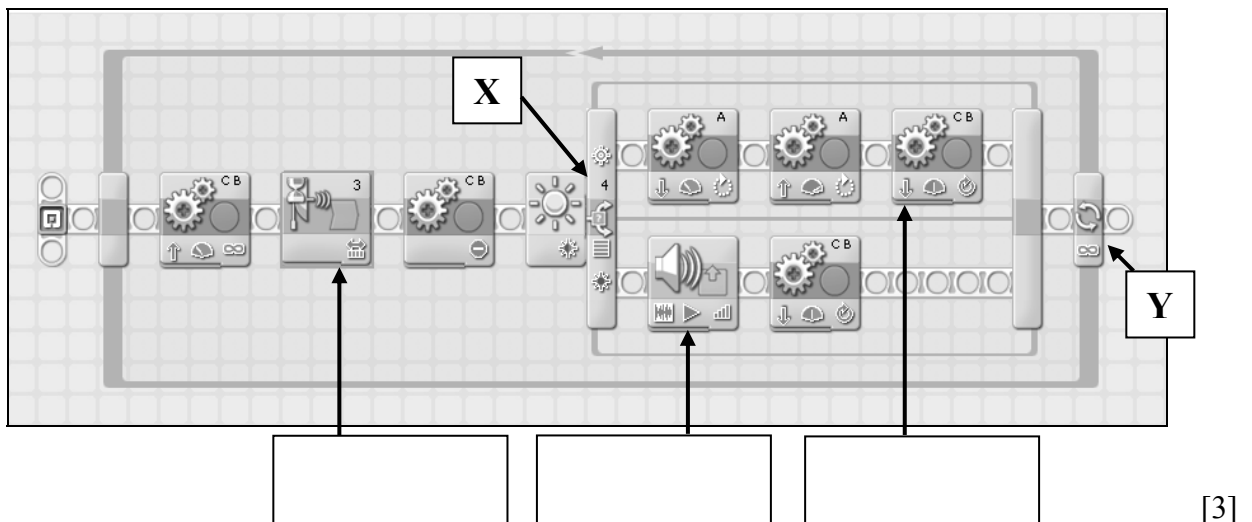   c. How is the **World Wide Web** (WWW) different from the **Internet**?

        _____

        _____ [2]

Section B – Answer BOTH Questions

12. The picture on the right shows an assembled mini-golfer using the *Lego Mindstorms Kit*.

The mini-golfer moves towards a ball and then uses a motor to swing its golfing arm to hit a red ball. It does not hit the ball if the ball is blue.

The following picture shows the blocks that make up the program to activate the mini-golfer. Study the picture and then answer the questions set on it.

[3]

    a. Identify the following three blocks in the picture above by **writing the type of block** in the empty boxes given above.
        i. A move block
        ii. A sound block
        iii. A block that waits for a sensor input

b. The program on the previous page makes use of two sensors. Write the **name** of these sensors and briefly mention their **function**.

Name of Sensor	Function

[2]

[2]

c. The mini-golfer makes use of a motor to swing the golfing arm to kick the ball. To which **port** was this motor attached?

_____ [1]

d. The program makes use of the three programming constructs.
   i. The three constructs are described in the table below. The 'Sequence' construct has been given. Identify the **two other constructs** from their description.

Construct	Description
Sequence	This section of program makes the mini-golfer search for a ball.
	This part of the program detects whether the ball is red or blue.
	This section of program makes the device carry out the instructions again and again.

[1]

[1]

   ii. The picture on the previous page has two items labeled 'X' and 'Y'. Write the name of the **construct** that is being represented by the two items.
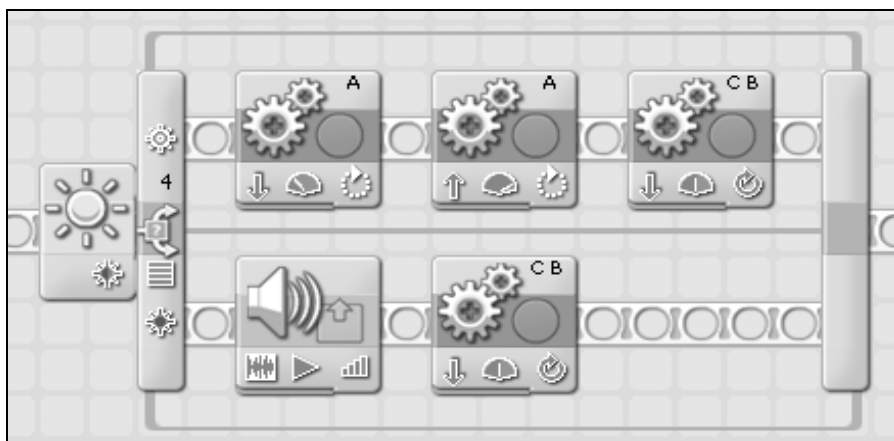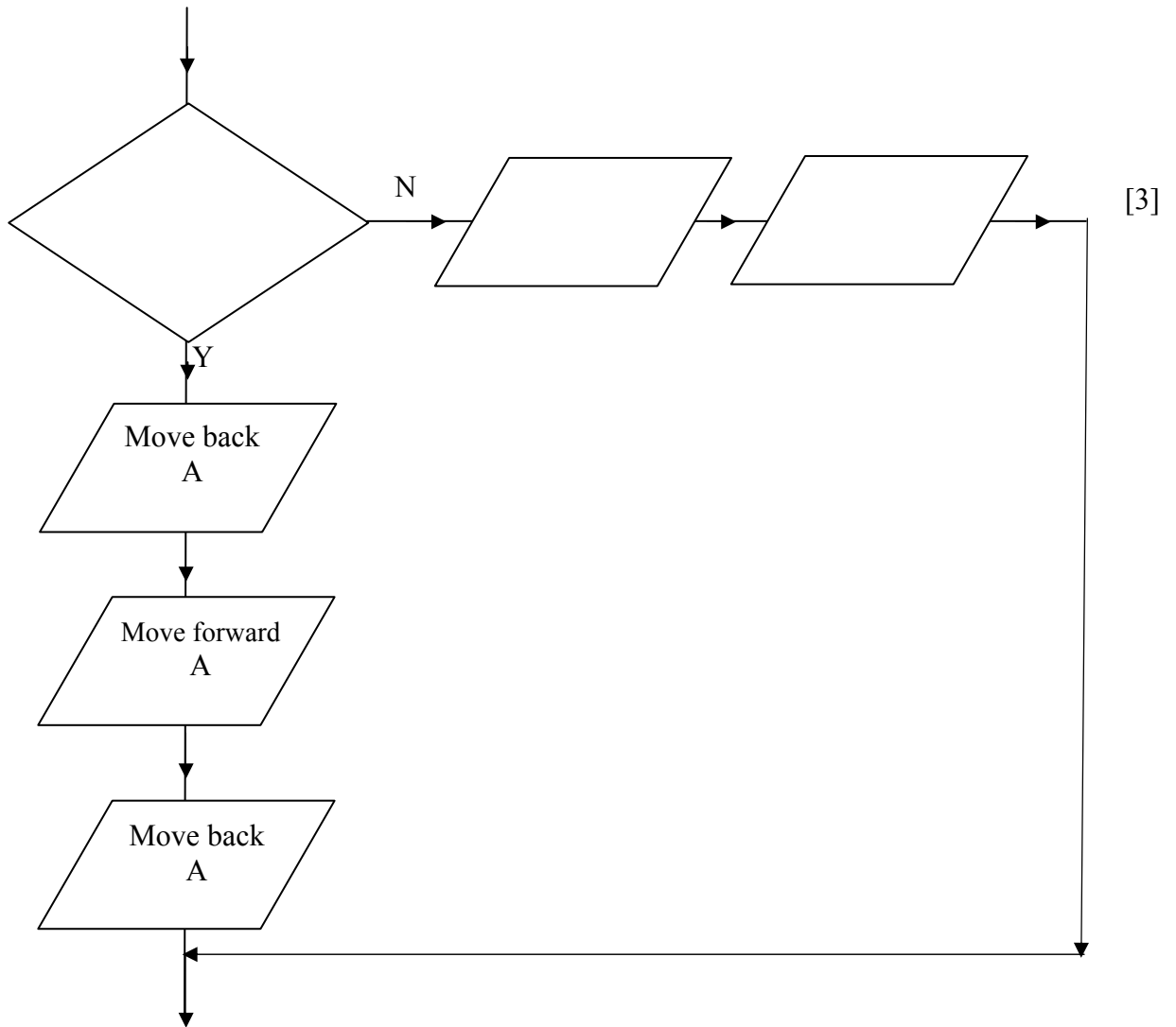
   Item X: _____ [1]

   Item Y: _____ [1]

e. Before the program was set up, a flowchart was drawn to plan the task of the mini golfer.

Fill in the three **flowchart symbols** on the following page so that the flowchart represents the section of the program that is duplicated below.
(Take the cut off point for the light intensity to be 50)

N

Y

Move back
A

Move forward
A

Move back
A

[3]

---

13. A typical computer system has both Main Memory and Backing (Secondary) Storage. RAM and ROM make up the Main Memory.

   a. Why is Main Memory an **essential part** of a computer system?

   _____

   _____ [1]

   b. What do the acronyms **RAM** and **ROM** stand for?

   RAM: _____ [1]

   ROM: _____ [1]

   c. Write down **two differences** between RAM and ROM.

RAM	ROM	
		[1]
		[1]

d.   Draw **arrows** to match the following storage media with their typical capacities.

Storage media
CD-ROM
Hard Disk
Pen Drive
DVD-ROM

Capacity
5 GB
650 MB
500 GB
32 GB

[1]

[1]

[1]

[1]

Data on a backing storage medium can be accessed either serially or directly.

e.   What is **direct access**?

_____

_____ [2]

f.   Give one **application** where direct access would be ideal.

_____ [1]

g.   Give one **application** where serial access would be ideal.

_____ [1]

h.   Mention one **storage medium** that is only capable of serial access.

_____ [1]

i.   Suggest one **disadvantage** of serial access.

_____

_____ [1]