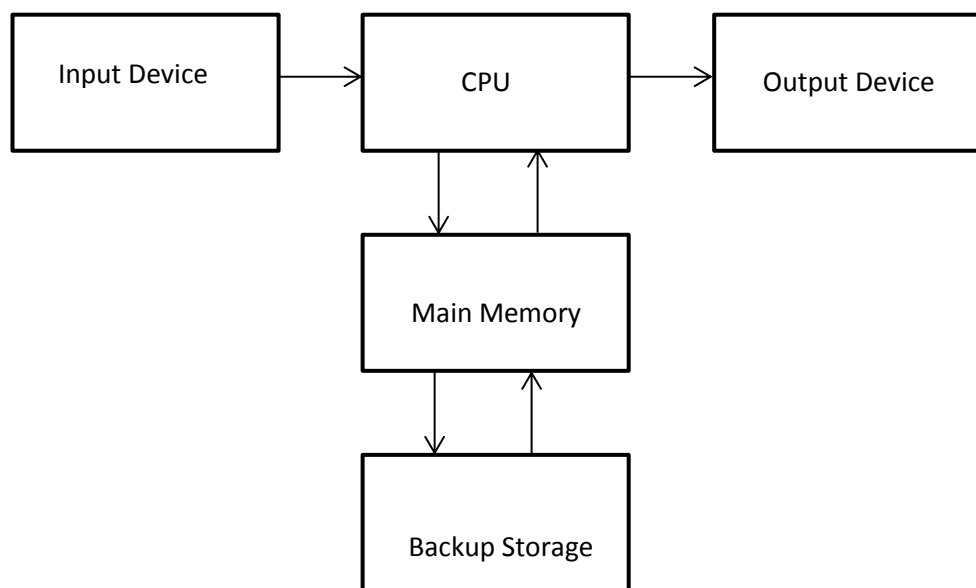


1. In the diagram below label the components of a computer system using the following terms:

*Input devices, main memory, backup storage, output device, CPU*

a.



[5]

2. Fill in the blanks with words from the following:

*Updated, downloaded, malware, worm, replicate, infected, format, antivirus*

[5]

A computer virus is a type of malware. Viruses replicate by inserting copies of themselves into files. These files would then be infected. We can use an antivirus utility in order to locate and remove viruses in our system. This utility needs to be updated regularly because new viruses are created all the time.

3. Match the following storage devices with their possible approximate capacities. [5]  
*The first one has been done for you.*

a.	Single-sided DVD
b.	RAM
c.	Hard Disk
d.	CD
e.	Pen Drive
f.	Floppy Disk

i.	1.44MB
ii.	700MB
iii.	32GB
iv.	1TB
v.	4GB
vi.	8GB

a.	b.	c.	d.	e.	f.
v	vi	iv	ii	iii	i

4. Various System Software help run applications and keep a system in good health. [3]  
 a. Give the correct term for:

i.	A software facility that temporarily stores text and graphics data so they can be transferred between applications.	<i>Clipboard</i>
ii.	A utility used to collect parts of the same files into contiguous clusters and hence improve disk access speeds.	<i>Defrag (Defragmentation)</i>
iii.	A utility that compresses files so that they can be more easily sent over a network connection.	<i>Compression Software/ Winzip</i>

- b. Many operating systems incorporate a GUI. [1]  
 i. What does GUI stand for? [1]  
*Graphic User Interface*  
 ii. Explain how a GUI makes it easier for the user to use the system. [1]  
*Use of icons makes the system more self-explanatory*

5. The Internet can link us to the whole world. [2]  
 a. Tick the appropriate box.

		<b>Internet</b>	<b>WWW</b>
i.	An infrastructure connecting millions of computers.	X	
ii.	A system of hyperlinked documents or web pages.		X

- b. What is a URL (Uniform Resource Locator)? [1]  
*A unique address for documents and other resources on the World Wide Web.*  
 c. E-mail communication can fall subject to a variety of security issues. Briefly explain two ways one can help keep his e-mail account secure. [2]  
 i. *Use of a secure password that one never shares with everyone*  
 ii. *Never open or download attachments or follow links from unfamiliar senders.*

*Accept reasonable answers  
 Do not accept overly-simple answers e.g. 'password'*

6. Special devices can help us input data more effectively.
- a. A multiple choice exam is being set to 5000 students. Name an input device ideal to input and hence process all these exam papers automatically. [1]  
*OMR*
- 
- b. At a point of sale a barcode reader can make bill production faster. Do you expect the item price to be coded into the barcode? Explain your answer. [2]  
 Yes/No *No*  
 Explanation *Item price varies with time and place*
- 
- c. Special input devices can facilitate computer use for blind people. Name one such input device. [1]  
*Braille keyboard*  
*(Accept also microphone with use of voice recognition software)*
- 
- d. A business is having its logo redesigned. Suggest an input device which could be ideal at the design stage. [1]  
*Graphics tablet*
- 

7. Computerised databases have various advantages over manual ones.
- a. Name **two** advantages of computerising a database. [2]  
 i. *Data is easier and more efficient to process.*  
 ii. *One can take a backup of all data fairly easily.*
- 
- Accept reasonable answers*

- b. Fill in the blanks with the appropriate terms: [3]  
 A library has a computerised database that includes a number of files. One of these files is the Book File. The book *record* is the basic unit of processing for this file and contains all book details. It has a unique Book ID number as its *keyfield*. It also has a number of other *fields* including ‘book name’, ‘author’ etc.

8. Computer users need to be aware of the various software available in order to make the best use of their machines.
- a. Distinguish between software and hardware. [1]  
*Hardware refers to the tangible aspect of a computer system including the CPU, motherboard and devices.*  
*Software refers to program and associated data and is not tangible.*
- 

- b. Name the software ideal for use in each case: [4]

i.	Creating and managing a school database system.	<i>DBMS</i>
ii.	A family budgeting system.	<i>Spreadsheet</i>
iii.	Creating a company logo.	<i>Graphics Package</i>
iv.	Viewing and displaying web pages.	<i>Web Browser</i>

*Do not accept product names e.g. ‘Microsoft Word’ etc.*

9. Logic gates are small hardware items capable of decision-making. [1]  
 a. Name one **use** of logic gates in a computer system. [1]  
*Carrying out CPU calculations*

*Accept reasonable answers*

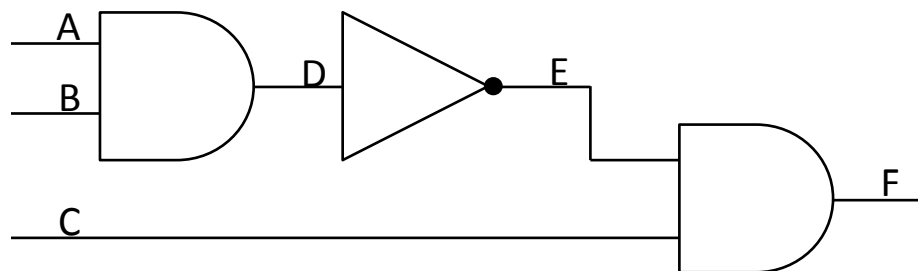
- b. Give the truth table for an OR gate with inputs A and B and output C. [1]

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

*Award full mark only for completely correct truth table.*

*No marks for part answers*

- c. Complete the truth table for the logic circuit below: [3]



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

*1 mark for each correctly completed column*

10. A flowchart is being drawn up to find a team's goal average in a netball league [5]  
 where a total of 16 games will be played. Draw the flowchart for a program to:  
 - Read the goals scored by the team for each game.  
 - Find and output the goal average of the team.

*Accept correct implementations*

*1 mark for implementation of loop*

*1 mark for correct loop-ending condition*

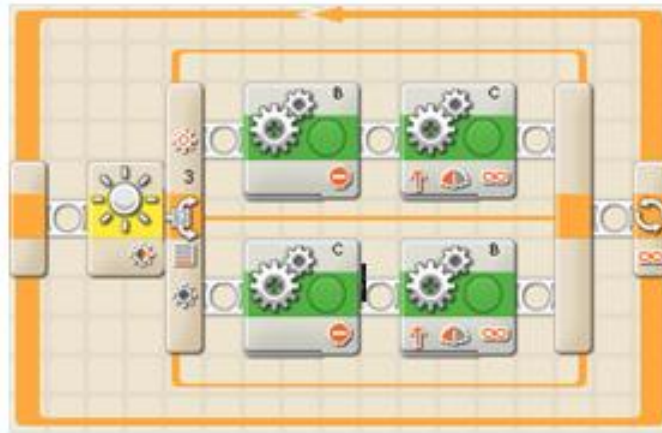
*1 mark for reasonable calculation*

*1 mark for correct output command*

*1 mark for overall correct flowchart*

11. The following is a simple NXT line-follower program.

[5]



a.	Name the <b>sensor</b> being used by the above program.	<i>Light sensor</i>
b.	How many <b>motors</b> does the above program make use of?	<i>Two</i>
c.	How many times does this program loop?	<i>Infinitely</i>
d.	What <b>sensor</b> would be necessary to make the program loop until the NXT senses a physical obstruction ahead?	<i>Ultrasonic sensor (do not accept: 'touch sensor')</i>
e.	This program implements a decision. What is this decision dependent on?	<i>Light intensity sensed by the light sensor</i>

### Section B

12. Flowcharts are an important tool in the design of a new system.

a. Explain the relevance of flowcharts for programmers.

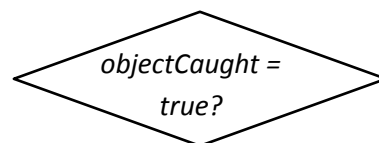
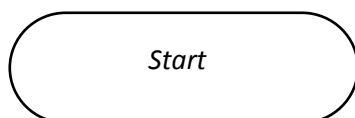
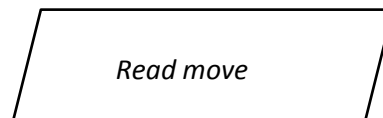
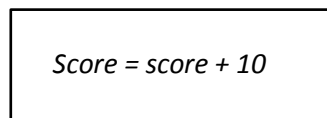
[1]

*Flowcharts are diagrammatic descriptions of algorithms and hence help design programs*

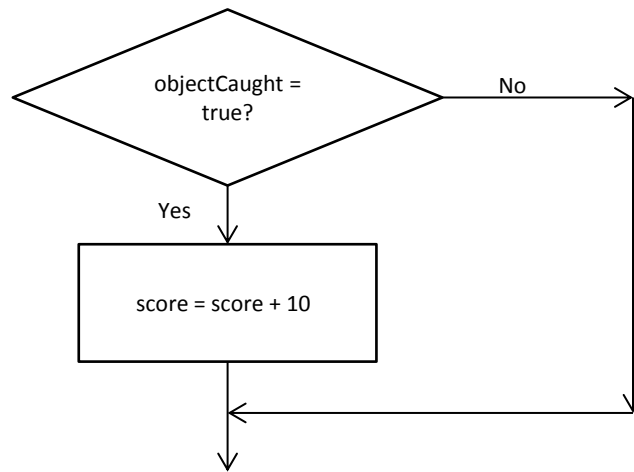
b. Put the following instructions in the correct flowchart symbols:

[4]

- start
- score = score + 10
- read move
- objectCaught = true?

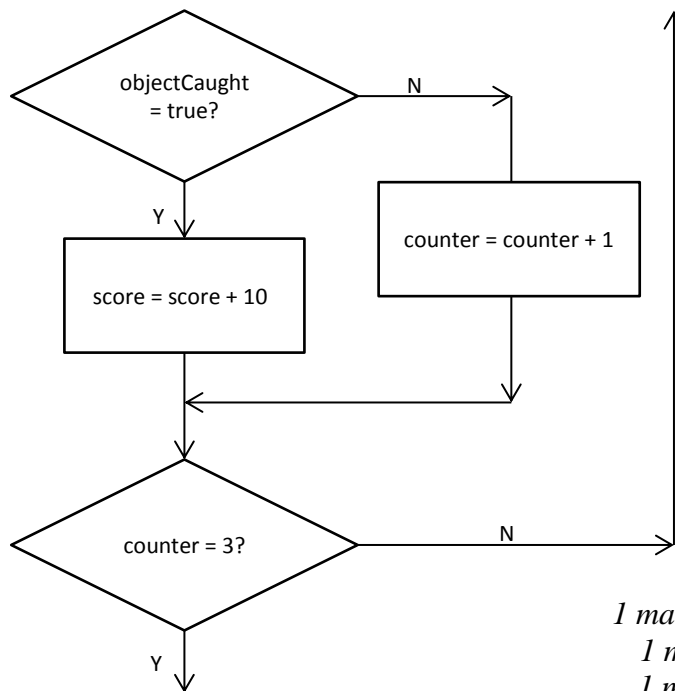


- c. A game is being designed in which the user has to manoeuvre his character to catch falling objects. Use one or more of the above instructions with flowchart symbols to create a part flowchart which awards the user ten points if the value of the variable objectCaught is true. [3]



*1 mark for correct decision  
1 mark for correct calculation of score  
1 mark for correct flowchart*

- d. Redraw the above part flowchart (in c) so that it loops until the user misses 3 falling objects. [4]



*1 mark for use of counter  
1 mark counter incrementation  
1 mark for correct condition  
1 mark for correct flowchart*

- e. Answer **True** or **False**. [3]

i.	A loop is a section of a program which may be executed repeatedly, usually until a certain condition is met.	<i>True</i>
ii.	A program cannot have an infinite loop.	<i>False</i>
iii.	Pseudocode is a textual rendition of an algorithm.	<i>True</i>

13. Computers represent data in binary.

- a. Carry out the necessary conversions to complete the table below. [6]

<b>Binary</b>	<b>Decimal</b>	<b>Hexadecimal</b>
100111	39	27
111000	56	38
111010	58	3A

- b. ASCII is a 7-bit coding system.  
i. What does ASCII stand for? [1]

American Standard Code for Information Interchange

- ii. How many different characters can ASCII represent? [1]  
128. Accept also  $2^7$

- c. When converting from analog to digital, which of the following ensures the better digital quality? [1]

Underline the correct answer

High sampling rate

Low sampling rate

- d. A smartphone has a display size of 1080 by 1920 pixels. It uses 24-bit colour representation.

*You are NOT to show the results to your calculations but only to display calculations as e.g.  $(34*2)/6$*

- i. How many bits are used to light the whole screen? [1]  
 $1080 * 1920 * 24$

Award 0 for 49766400 as students are not supposed to have a calculator

- ii. How would you convert your answer to (i) to bytes? [1]  
 $(1080 * 1920 * 24)/8$

Award 0 for 6220800 as students are not supposed to have a calculator

- iii. What is colour depth? [1]  
Number of colours available in a visual display

- iv. What is the colour depth of this screen? [1]  
 $2^{24}$

iii. *Pixel density is a measure of the number of pixels per cm.*

Two smartphones have a display size of 1080 by 1920 pixels.

Smartphone A has a screen size of 3.7 inches and Smartphone B of 5 inches.

Which screen has the higher pixel density? [1]

Screen A

Hence how will the output on this screen differ from that of the other? (apart from in screen size)

*The effective resolution is better and hence the output will be sharper.* [1]