

1.

a) Convert the denary number 155 into:

i. Binary

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.....

ii. Hexadecimal

.....
.....

iii. Convert the following hexadecimal number into denary:

9F

.....
.....

(6)

b)

i. Convert the following binary number into denary:

10101001

.....
.....

ii. Convert the following binary number into hexadecimal:

101011000111

.....
.....

iii. Convert the following hexadecimal number into binary:

7ED

.....
.....

(6)

2.

a) How many megabytes (MB) of storage would be needed to store 400 photographs each of which are 8 MB in size?

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.....
.....

[2]

b) Write your answer from part a in gigabytes (GB).

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

[1]

3. An 8-bit register is used to control the operations of an automatic washing machine.

Red led Blink	Green Led Blink	Spin clock-wise	Spin anti-clockwise	Water valve	Drain valve	Detergent valve	Buzzer
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Value 1 in the register indicates that a specific function is **ON**; a 0 value indicates it is **OFF**

For example:

1	0	1	0	0	0	1	0
---	---	---	---	---	---	---	---

- Red Led Blink **ON**
- Green Led Blink **OFF**
- Spin clock-wise **ON**
- Spin anti-clockwise **OFF**
- Water valve **OFF**
- Drain valve **OFF**
- Detergent valve **ON**
- Buzzer **OFF**

a) What does the following register indicate?

1	0	0	1	1	0	1	0
---	---	---	---	---	---	---	---

b) What would be the content of the 8-bit register if the following conditions existed:

- Red Led Blink **OFF**
- Green Led Blink **ON**
- Spin clock-wise **OFF**
- Spin anti-clockwise **OFF**
- Water valve **OFF**
- Drain valve **ON**
- Detergent valve **OFF**
- Buzzer **ON**

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[1]

c) Describe how HTML is used when developing webpages?

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[3]

4.

a) Explain the two parts that make up a typical MAC address.

[2]

b) A Mac address can be termed *UAA* or *LAA*. Give two reasons why MAC addresses needs to be changed when using *LAA*.

[4]

5.

a) Give four functions of typical operating system (OS).

[4]

b) Describe three different types of interrupt.

[3]

c) What is meant by the term buffer?

.....

.....

[2]

d) Six stages in a von Neumann fetch –execute cycle are shown in the table below.

Put each stage in the correct sequence by writing the numbers 1 to 6 in the right hand column. The first one has been done for you.

The contents (instructions) of the MDR are then copied and placed into the current instruction register(CIR)	
The instruction is finally decoded and then executed by sending out signals (via the control bus) to the various components of the computer system	
The value in the PC is then incremented by 1 so that it now points to the next instruction which has to be fetched	
The contents (instruction) at the memory location(address) contained in MAR are then copied temporarily into the memory data register(MDR)	
The program counter (PC) contains the address of the memory location of the next instruction which has to be fetched	1
This address is then copied from the PC to the memory address register (MAR); this is done using the address bus	

[5]

7.

a) Describe a suitable different application that uses each of the following sensors.

Sensor	Application
Temperature	
Light	
infrared	
Magnetic Field	

[4]

b) Give the most suitable input device for each of the following applications. A different device must be used given in each case.

Application	Suitable input device
Entering text and data into a word processing or spreadsheet	
Selecting an option or icon from an on screen menu	
Input a user's voice into a computer as part of voice recognition system	
Converting a hardcopy document into an electronic form to be stored in a computer	
System that allows a user to write and draw on a screen which then automatically saves the text and images in a memory	

[5]

8.

a) Inkjet printers usually fall into two categories: thermal bubble or piezoelectric.

Choose one of these categories and describe how ink droplets are produced.

Category:

.....

Description:

.....

.....

.....

[3]

b) Give two benefits of using OLED technology rather than LCD.

1

.....

2

.....

[2]

c) Write two applications of 3D printer.

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.....

[2]

9. Two types of RAM are DRAM and SRAM. In the diagram below, draw arrows to link each type of RAM to its correct feature(s).

DRAM

SRAM

Needs to be constantly refreshed to retain the data

Consumes the least power of the two types of RAM

Makes use of 'flip flops' to hold bits of memory

Used in computers where high speed processing is needed; e.g. (memory cache)

Has the higher storage capacity of the two types of RAM

[5]

10. Five file terms are shown on the left and five file descriptions are shown on the right. By drawing arrows link each file term to its correct file description.

MP3 File

BMP File

MIDI File

Jpeg image

Lossy file format

Uses compression technology to reduce the size of an image

Uses compression technology to reduce the size of a music file by up to 90%

Uses compression algorithm that reduces the file size by eliminating unnecessary bits of data

A raw bitmap image that has not yet been compressed

Communication protocol that allows electronic musical instrument to interact with each other

[5]

11. Place each of the following storage and memory devices into their correct category:

- Blue-ray disk
- DVD –RAM
- Fixed hard-disk drive (HDD)
- Fixed solid-state drive(SSD)
- Flash memory/memory stick
- RAM
- Removable hard-disk drive(HDD)
- ROM

Primary	Secondary	Off-line