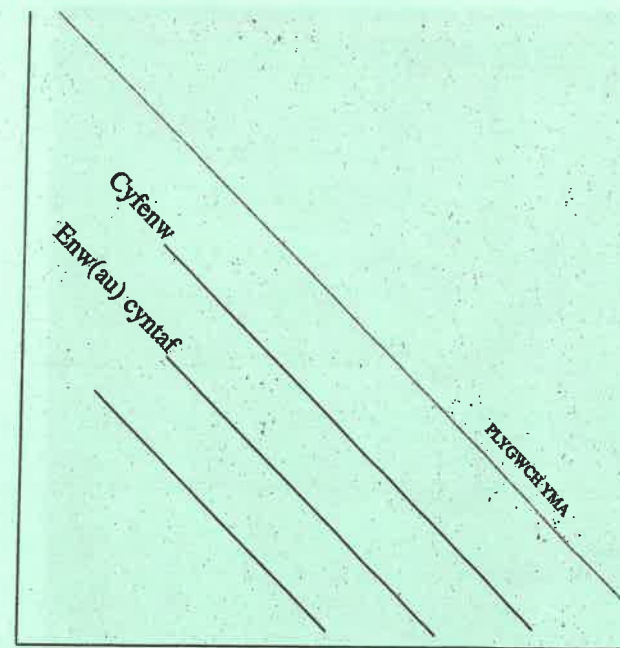
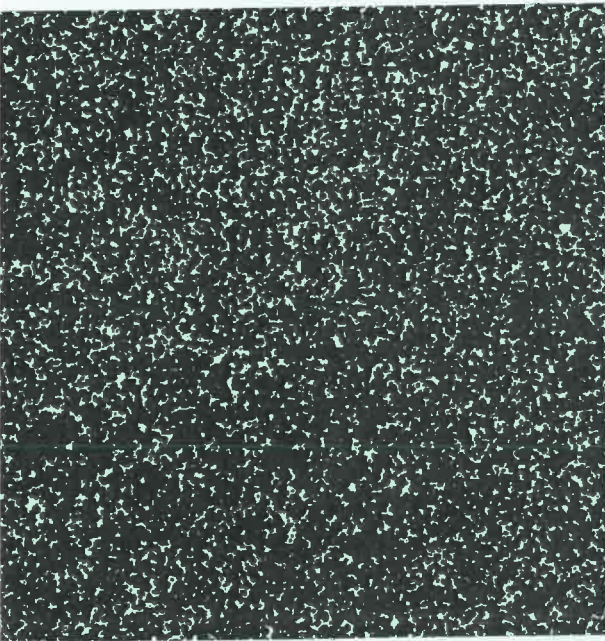






Page 1 of 1

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012

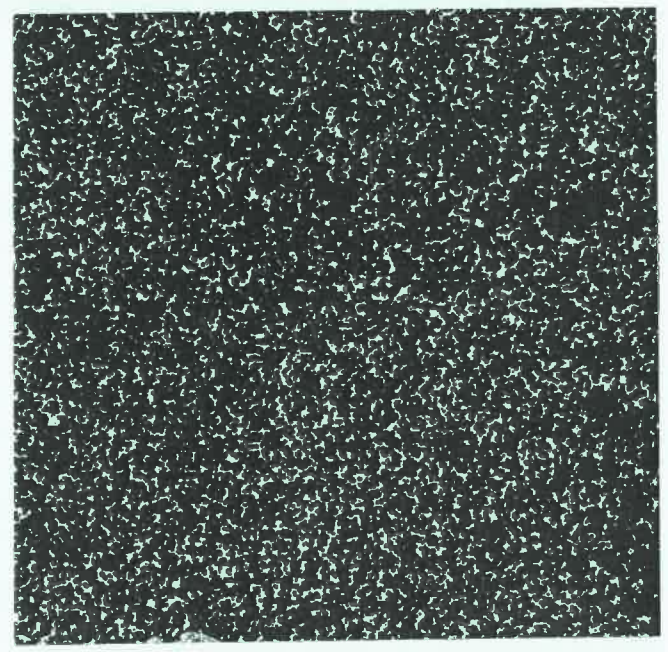
12/12/2012

12/12/2012

12/12/2012

12/12/2012

12/12/2012



* QUESTION ONE *

a) i)
$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 1 \quad 1 \quad 1 \quad 0 \quad 0 \quad 1 \quad 1 \end{array}$$

* Answer = $(1110011)_2 \rightarrow 119$

ii)
$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \quad 0 \end{array}$$

* Answer = $(01100010)_2 \rightarrow 18$

b) i)
$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 1 \quad 1 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \quad 1 \end{array}$$

$$128 + 64 + 32 + 16 + 1 =$$

* Answer = 241

ii)
$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 1 \quad 0 \quad 1 \end{array}$$

$$64 + 16 + 4 + 1 = 85$$

* Answer = 85

c) i)
$$\begin{array}{r} 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ A \quad B \quad C \quad D \quad E \quad F \end{array}$$

$$7 \times 16 = 112$$

$$15 \times 16 = 240$$

$$127$$

$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 0 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \quad 1 \end{array}$$

* Answer = $(01111111)_2$

ii)
$$\begin{array}{r} 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \\ 1 \quad 1 \quad 1 \quad 0 \quad 1 \quad 1 \quad 0 \quad 0 \quad 0 \end{array}$$

* Answer = $(10110000)_2$

d) i) A B C D E F
10 11 12 13 14 15

$$10 \times 16' = 160$$

$$5 \times 16' = 5$$

* Answer = 165_{10}

ii) $3 \times 16' = 48$
 $15 \times 16' = 15$

* Answer = 53_{10}

e) * Answer = 5 (16, 8, 4, 2, 1 bits)

f) i) $1920 \times 1000 = 2073600$
 $\div 32$

* Answer = 64,800 bits

ii) $1920 \times 1080 = 2073600$
 $\div 32$
 $= 64,800$
 $\div 20$

* Answer = 3240 bits

iii) $3240 \text{ bits} \div 20 \text{ mbs} = 162 \text{ seconds}$

g) i) 108 mbs

ii) Single Layer approx 4.7 GB
* Answer = Dual Layer 9.4 GB

iii) Blu Ray Disk = 25 GB

2

3

1

1

QUESTION TWO

a) Address Bus

The address bus is used by the CPU to sign a unique identifier to the program. Hardware that allows the system to recognise it.

ii) Control Bus

Control Bus is the bus that allows the CPU to control and co-ordinate the operation of the system and its hardware.

ii) Data bus

As per the name the data bus moves the data between the CPU and its destination.

b)

Both the Data bus and address bus as well as the control bus allow data to be written to and read from to maintain a constant flow around the system.

c) USB (Universal Serial Bus)

Advantages

Plug and Play - USB devices can be plugged in and removed as required often to an external port.

Portable Storage - USB Flash Storage is portable hard drive can be conveniently plugged in and removed as needed for easy transport as well as backup of data.

Transfer speeds USB 2.0 - Users may accidentally plug USB drives into the USB 2.0 block.

QUESTION 2 contd.

part in error rather than the blue USB 3.0 port which results in much slower transfer speed rather than take advantage of the 5 Gbps speed provided by USB 3.0.

Device Compatibility
USB plug and play devices such as peripheral are generally accepted by the Operating System however the device may not work due to age, lack of compatibility with the current operating system version or lack of digitally signed driver.

USB Flash Drives
Advantageous for easy portability but fairly quick transfer speeds via USB 3.0 however a USB Flash Drive is easily lost due to its small size. If this occurs it can be harmful and a security risk if the drive is not encrypted.

4

b) Internet TCP/IP v4 addresses consist of 32-bit characters which have a new finite number of available combinations such as 254 for large companies the limit the amount of devices on a network to 254/255. Other large companies as networks require more devices on the network than Pcs laptops, phones, tablets etc. With the increase in the amount of network capable devices IP v4 is now becoming overwhelmed and the network are now turning to 64 bit as IPv6.

3

c) DHCP - Dynamic Host Control Protocol.
DHCP is used in virtually every network. It dynamically assigns IP addresses to devices when they connect to a network. When that device disconnects the assigned IP address becomes available ready to be assigned to another device. DHCP can allow up to 255/256 devices to be dynamically assigned as the Network Administrator can limit the amount of DHCP addresses available thereby limiting the amount of devices that can be connected.

3

a) Password Security

One of the first things required is for the user to change the password username and password to log in to the router. Most routers ship with a standard Admin IP and password that can easily be found online and then used to Hackers to access your network.

~~With~~ With Secure Password

It is advisable that the user change the user password using the WPA-TKIP/AES standard. Password should NOT use known names, pet name or word that others can easily guess. The password should consist of number, letters, Capital letters and special characters such as !, ?, *, # etc.

The user should also set up a home group in Windows 10 that only specified devices within their home can access and share files on devices. The group should only be discouraged by devices within this group and any file sharing should be only available within the group.

Finally, the user can set up a guest network with its own encryption that guest or visitors to the property can use. This guest network should not allow access to any other devices on the network to prevent any data theft.

10

a) When viewing this image the following items are apparent

Installed Memory (RAM) 8.00 GB (3.11 GB) usable. Firstly, the system has 32GB of RAM physically installed and only 8GB of RAM is visible. The system board needs to be reviewed and the manual checked to see what the maximum amount of RAM that the system board can accept is installing. 32 GB is possible if the system board has a maximum capacity of 8GB or 4 x 2GB modules. The RAM module and the Memory socket on the board should also be checked. Once the above has been checked the version of Windows 10 should also be reviewed. Although only 8GB of RAM is being recognised only 3.11 GB is showing as usable. This has shown because a 32-bit version of Windows 10 is installed which has a maximum capacity of 4 GB RAM of which only about 3.75 GB would be usable/visible. The user should be advised to upgrade Windows to the 64-bit version to take advantage of the 64-bit Architecture and CPU. Windows 7 was to provide users with a 32-bit and 64-bit installation. Although I am unsure if this is still the case with Windows 10. In general, I would also check what type of storage is being used and

Question 3 cont'd

advice on the most suitable type of storage that would be best suited to them such as a 2.5" SSD or M.2 SSD

One thing to note in the CPU is not

What the Intel i3 is a capable processor I would advise the client to upgrade to a higher spec i5 or i7 to take

advantage of the increased physical core count as well as the additional virtual

cores available via Hyper Threading. For Photoshop this will allow the system to process the image faster due to the

advantage of higher clock speed and increased core count.

b) Virtual Memory as page file means is additional storage that is utilized via the HDD or SSD. It is used when the operating system runs out of RAM

which result in the OS using an allocated part of the HDD as additional memory.

ii) Page Fault - Refers to corrupt data in the page file or virtual memory. It can be caused by the page file becoming full as the HDD becomes faulty due to bad sectors.

iii) Page Disk Threading Occurs when the HDD spindle is constantly turning, often rapidly, to access different data stored on separate parts of the physical HDD platter. This results in increased wear which can shorten the life of

9

12

c)

Question 3 Cont'd

HDD as could cause the drive to fail.

Task Manager.

Task Manager allows the user to monitor and view system performance. In its basic mode it also shows programs that are currently running but does not show windows

processes. However when you switch to advanced mode it will allow you to view all processes as programs that are running as well as

how many individual processes each program has as well as the amount of RAM that they are using. It will also display the amount of CPU utilization as well as

whether the program is running as has become unresponsive. If a program as process has become unresponsive it allow the user to highlight and end the program and all of its processes (END TASK).

Task Manager also shows a simple monitor system monitoring tab which shows the CPU usage, speed, memory usage etc. This is useful for identifying issues with tasks that may be using too much RAM as CPU time.

Task Manager also has a Start up Program control section that use to be part of MSCONFIG. This allows the user to control which programs are launched when Windows is launched.

Preventing unnecessary program launching on start up can help boost system start up time as well as save CPU cycles and RAM.

4