



PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeisywyr

1. Rhwng yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwng eich enw yn y lle a ddarperir i'r dde a seilwch i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgrifen ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu script annarlennadwy, neu drefnu iddi gael ei threipio a chael yr ymgeisydd i dalu.
4. Ysgrifennwch eich atebion mewn linc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddyn.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyliwr/gwyliwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyrwr	Rheswch ffôn r cwestiynau a ymgeisiwyd penych	At Ddbenion y Swyddfa
2	Teitl y Papur Arholiad		
3	Cod y Modwl		
4	Dyddiad ac Amser yr Arholiad		
5	Lleoliad yr Arholiad		
6	Rhif Sedd		
7	Nifer y Llyfrau Atebion a gyflwynwyd		Cyfanswm

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

(Block Capitals) Forename(s) GEMMA Surname JONES

Please complete this section and SEAL before the examination starts.

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Examination Answer Book

12 Pages

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1	Student Number	08200000 45499149	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	COMPUTER ARCHITECTURE + NETWORKING	1	25
3	Module Code	ACCA4004	2	12
4	Date and Time of Examination	18/11/18 5.30pm	3	8
5	Examination Venue	CCAT	4	12
6	Seat Number	N/A		
7	Number of Answer Books handed in			
			Total	57

(Gweler yr ochr arall am y ffeiliau Cymraeg)

Question 1.

i) ~~128 64 32 16 8 4 2 1~~

a) 27 ~~6 0 1 1 0 0 1 1~~ a = 0

b) 115 ~~6 0 1 1 0 0 1 1~~ b = 0

~~115~~

~~- 64 - 32~~

~~51 19~~

ii) ~~128 64 32 16 8 4 2 1~~ Base 10.

a) ~~1 0 0 1 1 1 1 1~~ = 159

b) ~~0 0 1 0 0 1 1 1~~ = 39

a = 128

b = 32

16

8

4

2

1

39

159

2

iii) ~~128 64 32 16 8 4 2 1~~

a) BA ~~1 0 1 1 0 1 0 1~~

b) C3 ~~1 1 0 0 0 0 1 1~~

iv) ~~128 64 32 16 8 4 2 1~~ * I convert to binary first

a) 3B ~~0 0 1 1 1 0 1 1~~

b) F6 ~~1 1 1 1 0 1 1 0~~

3B = 59

F6 = 246

v) 32

Vii)

$$600 \times 400 = 240000$$

$$240000 \times 3 = 720000 \text{ kb}$$

It would occupy 720000 kb or 720 Bytes

Viii) Saving as a jpeg compresses by approx 10:1.

It will be 72000 (kb) approx.

Question 2

a) A - Application

P - Presentation

S - Session

T - Transport

N - Network

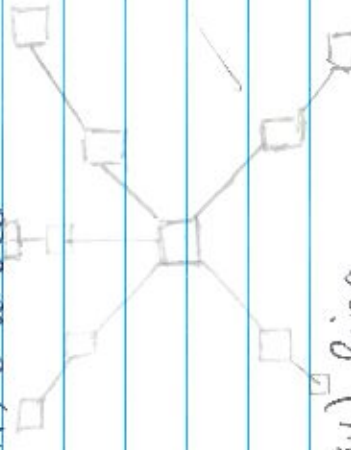
D - Data Link

P - Physical

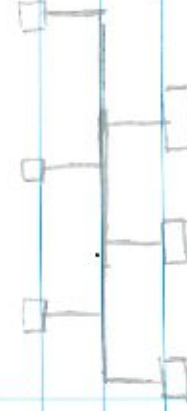
b) i) star



ii) Extended Star.



iii) Bus



iv) Ring



Q2A

c)

Application
Presentation

Session - Frames

Transport - Packets

Network - Segments

Data Link

Physical

d) ???

Question 3

a) Intel Core i7, 4.8GB, Quad core processor.

4.8GHz is fast enough to keep up with the demands of the data processed.

Quad core means there's 4 cores each working

independently so using different packages at the

same time shouldn't cause any problems with speed.

b) As some design packages use a lot of power and

need a lot of RAM I'd use x4 8GB modules - high

end Asus motherboard would hold x4 RAM modules DDR4,

max 64GB. Starting with x4 8GB modules leaves the

option to upgrade if needed in the future.

c) For non-volatile storage I would use a 500GB

SSD drive solely for the operating system and certain

software packages e.g. Photoshop. I would

then use a 2TB drive to store saved work.

Using the SSD for the operating system and software

ensures it runs quickly and more than meets the

minimum spec required.

d) The PC would need USB 3 ports, HDMI, Ethernet, graphics

tablet

e) Due to the graphics quality needed I would install an

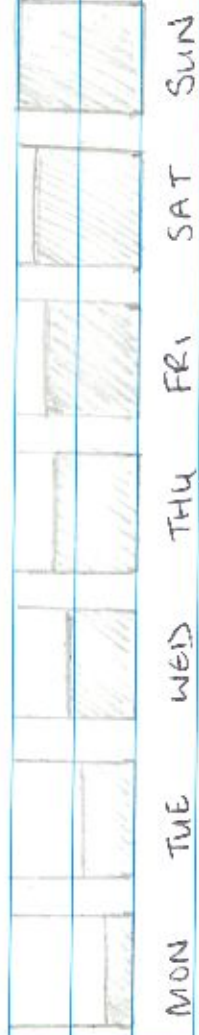
NVIDIA GeForce 1080 11GB graphics card. This will not

only provide excellent quality graphics but also has backup ports to allow dual screen use.

Question Four:

a) Types of back up.

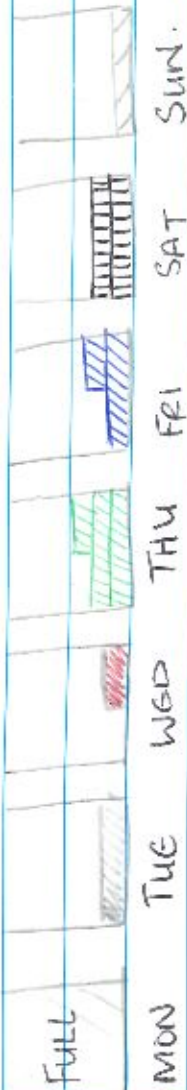
Full back up - data is backed up in full daily.



Differential Back up - All changes since full back up are saved



Incremental Back up - Only data that is changed each day is backed up. Very time consuming to restore from an incremental back up as you have to restore the last full back up plus each days back up of different data.



● Magnetic Tape

Advantages - Hold a lot of data, good for server backups.
Disadvantages - Easily damaged / lost, must be stored in Fire safe, take up a lot of room, could accidentally be wiped.

ii) Optical Media

Advantages - Come in different sizes to suit budget and need, reliable.
Disadvantages - if a hard drive sector becomes corrupt you can't retrieve data.

iii) External Hard Drive

Advantages - Different sizes to suit budget + need.

Inexpensive, portable, alternative to buying a PC with an internal HDD allowing you to purchase a small form factor PC or a Laptop.

Disadvantages - Insecure, could be lost / stolen, again if a sector is damaged can't retrieve data.

iv) SAN - Storage area network.

Advantages - Can be connected to wirelessly and managed from PC's / Laptops in the home. You can password protect folders on it. Great for home / family use. Back up documents to it and home PC / Laptop. Can be accessed away from home online.

Disadvantages - Can be stolen, if network is down can't connect to it.

v) USB Flash Drive.

Advantages - Extremely portable, USB can connect to any PC / Laptop.

Disadvantages - Won't work if PC / Laptop uses encryption software unless whitelisted, easily lost so not suitable for sensitive data.

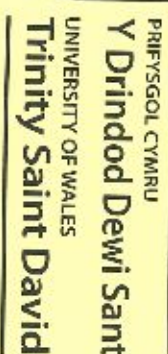
name, give me information requested, and seal to hide your name.

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	R3059930		comp Arch + Networking		ACCA4001		17-01-18 5.30pm		G45				1



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A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Llenwch y
 rhan hon,
 llythrennau y
 silyn,
 plygwrch fel
 a ddangosir
 a SELLWCI

Question 1 -

A)

i) 00011011

16

8

128	64	32	16	8	4	2	1
0	0	0	1	1	0	1	1
							2
							+ 1
							<u>27</u>

6 ✓

b) 01110011

64

32

16

2

+ 1

115

128	64	32	16	8	4	2	1
0	1	1	1	0	0	1	1

ii)

A) 159

128	64	32	16	8	4	2	1
1	0	0	1	1	1	1	1

128

64

16

8

4

2

1

+ 15

= 15

159

1

13) 39

32

4

2

1

39

128	64	32	16	8	4	2	1
0	0	1	0	0	1	1	1

6 ✓

(iii)

A) BA = 10111010

Hex
Table

1	8	4	2	1
2	1	0	1	1
3	1	0	1	0
4				

B) C3 = 11000011

5	8	4	2	1
6	1	1	0	0
7	0	0	1	1
8				

A-10

B-11

C-12

D-13

E-14

F-15

8	4	2	1
0	0	1	1
1	0	1	1

- 00111011 =

128	64	32	16	8	4	2	1
0	0	1	1	1	1	0	1

32

16

8

2

+ 1

59

4

4

3

3

iv)

B) F6 = 146

8	4	2	1
1	1	1	1
0	1	1	0

128

64

32

16

4

+ 2

146

v) 33

32

vii)

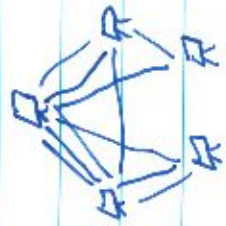
viii) The file size would reduce and as compressing the file means it takes up less storage space

question 2.

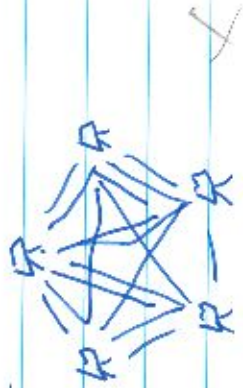
A)

b)

i) Star -



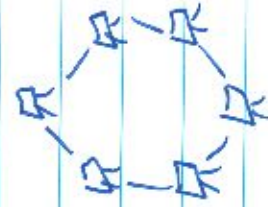
ii) extended Star -



iii) BUS



iv) Ring



question 3.

A) Intel i7 - more cores and better clock speed
 b) 8Gb - possibly more but at a minimum 8Gb should be enough to run any graphic design programme.

C) SSD for the operating system as it loads quicker I would use at least a 2TB SSD and a 2TB HDD for basic storage as its large enough for any graphical designs.

D)

Input features - keyboard, mouse and possibly a graphic tablet for the design work.

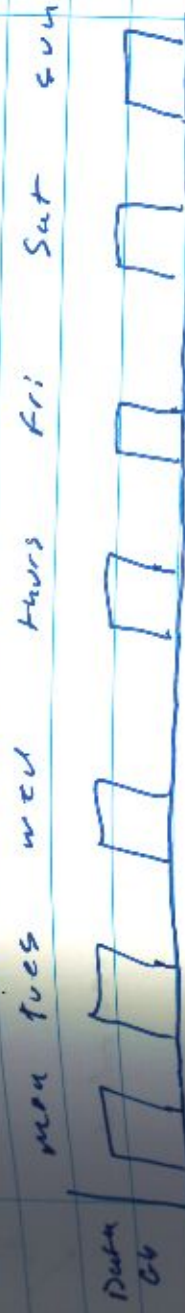
output features - HD or 4K monitor around 24 inches, speakers, a colour printer increase anything needs to be produced.

ports needed are at least 8 USB ports for things like keyboard, mouse, printer, graphic tablet and speakers along with spare ports for USB backup devices, HDMI 2.2 with HDCP for the monitor to give the best possible resolution.

E) The features in suitable graphics card would require are - 4K or HD output resolution, compatibility with the motherboard and on board ram.

question 4

A) ~~primary~~ full - This is where a full backup is created each night containing all the previous data backed up already.



partial - This is where a backup only backs up certain or specifically selected data after a full backup.



sequential - This backup type only backs up the changed data each night on top of the full backup.

b)

i) magnetic tape
Advantages -

Reliable, large storage capacity, tapes can be replaced easily to increase storage when required

Disadvantages -

slow backups, large storage space needed to house tapes

ii) optical media

Advantages - easy to store, can make multiple copies.

Disadvantages - fragile, prone to snapping or being damaged by scratching and can be damaged by heat, low storage capacity and requires disc drive to use.

iii) External hard drive -

Advantages - large capacity, fast copy speed, protected by casing and can be removed from the PC and transported easily

Disadvantages - can become corrupt, possible loss of data if moved or bumped while writing data

iv) SAN -

Advantages - large backup capacity

Disadvantages - slow write speed, large and non portable

v) USB flash drive -

Advantages - easy to transport,

disadvantages - low capacity, easily lost and damaged

Surname

SOUTHERN

(Block Capitals) Forename(s)

JAMES

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Complete
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1	Student Number	JS103556	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	Comp. Arch. and Networking	1	26
3	Module Code	ACCA4001	2	19
4	Date and Time of Examination	17/01/2018 5:30PM	3	18
5	Examination Venue	G45	4	13
9	Seat Number			
7	Number of Answer Books handed in			
			Total	76

(Gweler yr ochr arall am y ferstwr Cymraeg)

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A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Llenwch y rhan hon, lenwch y sêl, pryswch i'r aelodog a SELIWCH

$$27-16=11$$

$$11-8=3$$

$$3-2=1$$

$$1-1=0$$

$$115-64=51$$

$$51-32=19$$

$$19-16=3$$

$$3-2=1$$

$$1-1=0$$

$$27=00011011$$

$$115=011110011$$

	128	64	32	16	8	4	2	1
a) 1001111	1	0	0	1	1	1	1	1
b) 0010011	0	0	1	0	0	1	1	1

$$a) 128+16+8+4+2+1=159$$

$$b) 32+4+2+1=39$$

	8	4	2	1
a) BA	1	0	1	1
b) C3	1	0	1	0
	1	1	0	1
	3	0	1	1

	8	4	2	1
a) 3B	3	0	1	1
b) F6	1	0	1	1
	1	1	1	1
	6	0	1	0

	128	64	32	16	8	4	2	1
0	0	0	1	1	1	0	1	1
1	1	1	1	1	0	1	1	0

Vi. $6 \text{ bits} = 2^6 = 64$ Unique values ✓

Vii. $600 \times 400 = 240,000$ bytes pixels

Pixel = Red = 1 byte
 Green = 1 byte
 Blue = 1 byte
 So 3 bytes per pixel

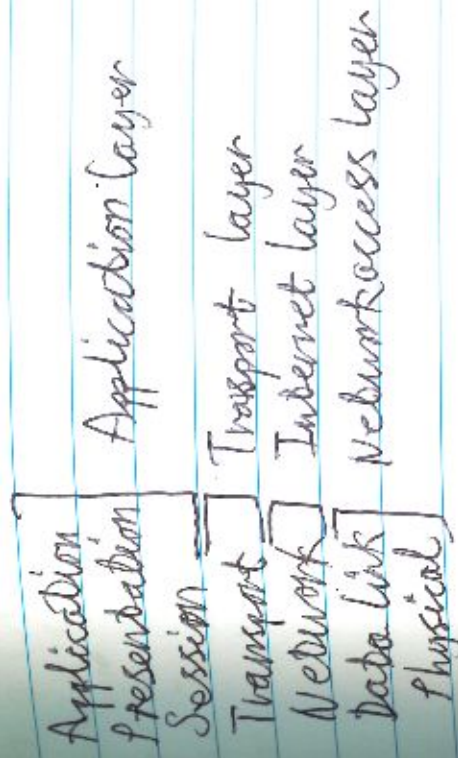
$3 \times 240,000 = 720,000$ bytes ✓

Viii. 720,000

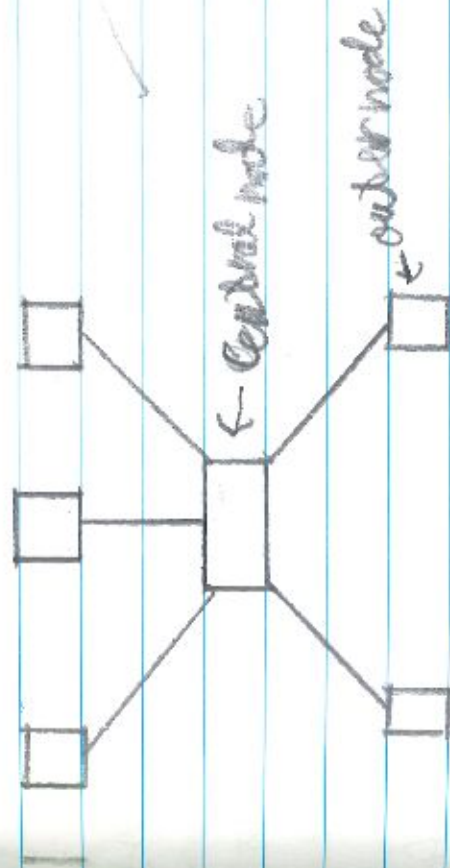
Jpeg compresses bit, so

$720,000 \div 10 = 72,000$ bytes ✓

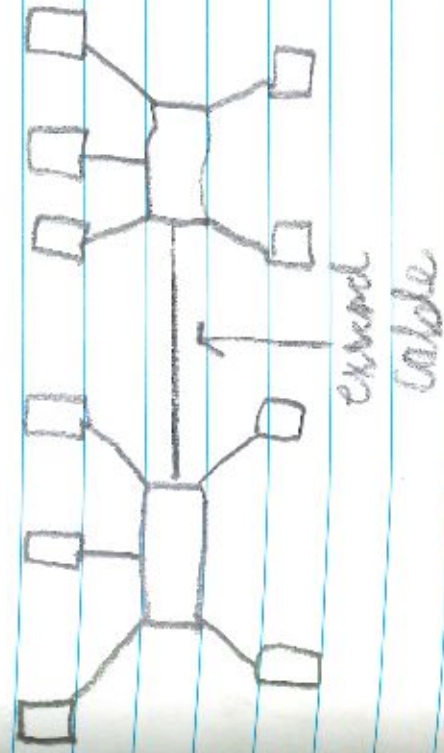
20 OSI layer



b. Star



E Extended Star

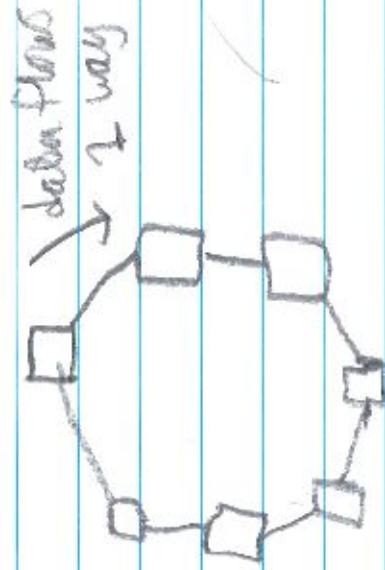


26

bus



IV. Ring



G Frames are in the Data link layer - MAC address
 Packet is in the Network layer - IP addressing
 Segment is in the Transport layer - UDP address

d. Full duplex - where data travels within different frequency from each other, so data transfer is faster

half duplex -

3.

a. For a CPU, a 3.9 GHz Quad Core i5 should be enough to handle graphic design. An alternative could be to use an i7 4.2 GHz Quad Core for the Hyper-Threading and Quad Core offers greater processing power than dual core.

b. For RAM, 16 GB at 3200 MHz should be enough for graphic design. An alternative could be to upgrade to 32 GB at 3400 MHz. The RAM speed of both RAM options allow for faster data retrieval. The 32 GB may be overkill, but some applications may need it.

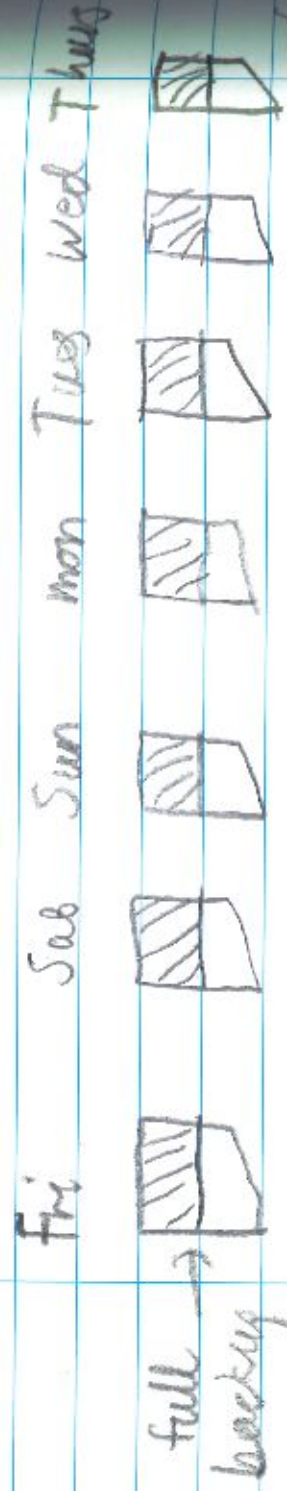
c. A 250 € SSD will allow for faster boot up and some programs may run faster. A 1 Tb HDD at 5,400 rpm may suffice for general storage. An alternative could be to upgrade to a 2 Tb HDD at 7,200 rpm for increased storage and performance.

d. At least 4 USB 3.0 should be minimum, possibly increase it to 6 USB 3.0. HDMI, DVI needed for monitors, Internet networking ports for connecting to the Internet.

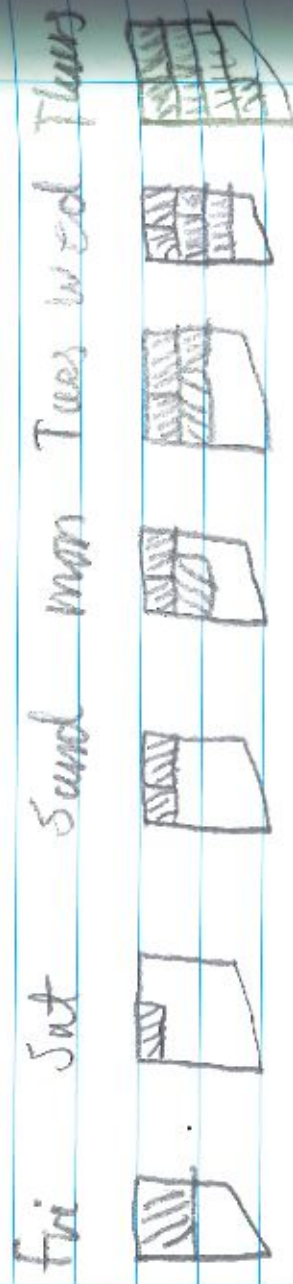
e. The NVIDIA 1080 offers 10 GB of RAM, high clock speed with boost, AIB has a large data bus width and two 1080S can be set in SLI. An alternative could be to use an Nvidia Quadro which has 12 GB RAM, similar clock speed to the 1080.

1080 and it is designed for graphics design in mind.

4a Full backup - is where data is fully backed up every day. This has the advantage of high tolerance to data loss, but it takes time to backup.



Differential backup - is where only the changes made to data is backed up. This has reduced backup time, and only the backup for the day is lost.



Incremental backup - is where only changes made on the day are backed up. This is the fastest backup.



that was change ~~the~~ since the last backup

Incremental backup - only data ~~that~~ backed up since the last incremental backup the day before.

vi Magnetic Tape - lots of tapes, so data fault tolerance is high. Tapes can be stored in safe boxes. Tapes can be cheap to buy, so cost is low.

Older technology, might not be compatible with new Tech, and not very future ~~proof~~ proofed, data could be lost if tapes use this magnetism and storage might not be large enough. ~~Tapes~~ ~~data~~ ~~have~~ have to look for the right tape with the data you need on it, so wastes time.

iii. External Hard Drive - has high capacity at least 1 TB of data, quick data retrieval and can be moved around. Could get lost/stolen easily and all data is kept in one HDD, so it could be all lost if HDD is destroyed.

iv. Storage Area Network - is a network that allows data to be stored/retrieved quickly and easily. Has high capacity and can be stored offsite.

iv. Could be hacked by hackers and data could be deleted/stolen and it costs money to ~~build~~ build and maintain ~~data~~ data cannot be saved if network goes down.

v. USB Drive - easy to transfer data, just plug and play. fast data transfer rate, highly portable. Can be cheap and lots of USB's can be stored in small storage lockboxes.

Pto →

vi. Can be lost/stolen easily, not much storage capacity
is not good for large data. Security may not be
installed, so data can be stolen. Difficult to retrieve
data, have to look for specific USB drives.

iii. Optical media - where data is stored on high capacity
disks. disks can be stored offsite easily, have decent
storage capacity, data transfer rate is high, so
good for fast data applications

If disks are scratched, then data could be lost or damaged,
this is older Tech, so it may not be very compatible with
new Tech. May require lots of disks to be effective, so adds
to cost and storage room

Complete
section,
remove
slip, fold as
indicated
and SEAL

FOLD

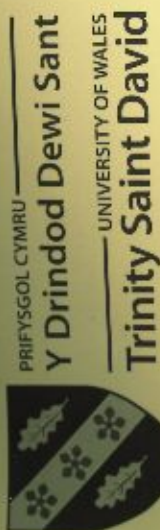
Surname

MORRIS

(Block Capitals) Forename(s)

WILLIAM

Please complete this section and SEAL before the examination starts.



Examination Answer Book

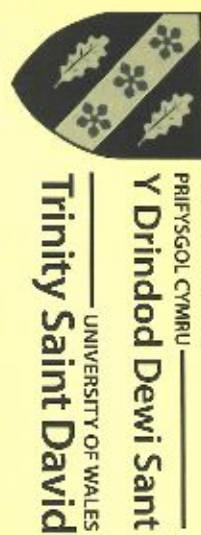
12 Pages

Instructions to candidates

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1	Student Number	185627	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	Computer Architecture + Networking	1	28
3	Module Code	ACCA4001	2	23
4	Date and Time of Examination	17/01/18 5.30pm - 7pm	3	9
5	Examination Venue	Coleg Sir gar 645	4	15
6	Seat Number			
7	Number of Answer Books handed in	1	Total	57

(Gweler yr ochr arall i'm y fersiwn Cymraeg)

PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgaiswyr

1. Rhwngch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwngch eich enw yn y lle a ddarperir i'r dde a seliwech i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgriflen **ddarlennadwy**. Gall yr Arholwyr naill ai anybyddu signifi annarllennadwy, neu drofnu iddi gael ei theipio a chael yr ymgaisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thymu llinell drwyddynt.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyllwrgwylwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Mlyfyrwr	Rheswch rhan y cwestiynau a ymgaiswyd genych	At Ddibenion y Swyddfa
2	Teitl y Papur Arholiad		
3	Cod y Modwl		
4	Dyddiad ac Amser yr Arholiad		
5	Lleoliad yr Arholiad		
6	Rhif Seod		
7	Nifer y Llyfrau Atebion a gyflwynwyd	Cyfanswm	

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw (LLYTHRENNAU BREISION) Enw(au) cyntaf

Llenwch y
rhan hon,
tyrnwch y
atbion,
pwysoch fel
a ddarperir
a SELIOWCH

I.

i)
$$\begin{array}{r} 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 0 \ 0 \ 0 \ 0 \ 1 \ 1 \ 0 \ 1 \end{array}$$
 $27 - 16 = 11$
 $11 - 8 = 3$

$27 = 00011011_2$ ✓

b)
$$\begin{array}{r} 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 0 \ 1 \ 1 \ 1 \ 0 \ 0 \ 1 \ 1 \end{array}$$
 $115 - 64 = 51$
 $51 - 32 = 19$
 $19 - 16 = 3$

$115 = 01110011_2$ ✓

ii)
$$\begin{array}{r} 128 \ 64 \ 32 \ 16 \ 8 \ 4 \ 2 \ 1 \\ 1 \ 0 \ 0 \ 1 \ 1 \ 1 \ 1 \ 1 \end{array}$$
 $128 + 16 + 8 + 4 + 2 + 1 = 159_{10}$
 $32 \times 4 + 2 + 1 = 39_{10}$

iii)
$$\begin{array}{r} B \ A \\ / \ \backslash \end{array}$$

a)
$$\begin{array}{r} 1011 \ 1010 \\ BA_{16} = 10111010_2 \end{array}$$
 ✓

b)
$$\begin{array}{r} C3 \\ / \ \backslash \end{array}$$
 $C3_{16} = 11000011_2$ ✓

iv)

a)
$$\begin{array}{r} 3B \\ / \ \backslash \\ 0011 \ 1011 \end{array}$$

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

$3B_{16} = 59_{10}$ ✓

160 x 80
240 x 6

iv)

b) F6 128 64 32 16 8 4 2 1
/ 1 1 1 1 0 1 1 0

1111 0110

$$F6_{16} = 246_{10}$$

6

v)

~~32 x 16 x 8~~

~~64~~ 64 unique values can be represented.

2

vii)

$$600 \times 400 = 240,000 \text{ total pixels}$$

Each pixel has three colour channels, each with a value of 8 bits.

$$8 \times 3 = 24 \text{ bits per pixel} = 3 \text{ bytes}$$

4

$$240,000 \times 3 \text{ bytes} = 720,000 \text{ bytes total}$$

viii)

The compressed JPEG would be much smaller.

2.

a)

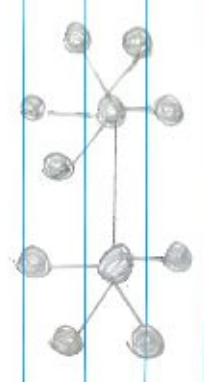
Application Layer
Presentation Layer
Session Layer
Transport Layer
Network Layer
Data-Link Layer
Physical Layer

Star

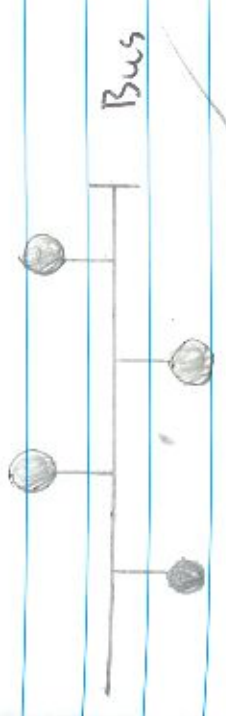


b) i)

Extended Star



ii)



iii)

Ring



iv)

2.

c)

Frames - MAC addressing - Data Link Layer.
Packets - IP addressing - Network Layer
Segments - Transport Layer

6

d)

Half Duplex is bi-directional data transfer but only in one direction at a time.

Simplex is data transfer in only one direction.

4

Full Duplex is data transfer in both directions at once.

3.

a)

I would suggest opting for an Intel i7. These CPUs can be a bit more expensive than an i5 but I think the extra cost is worth it as the spec calls for a high end machine and i7s support multithreading which will help improve performance.

b)

I would suggest ~~16~~ 16 GB of RAM as this will allow the user to have numerous graphic design programs like Blender and Photoshop open at once without slowing down.

2

c) If the PC will be used for manipulating graphics then there may be the need to store large files. For this reason I would suggest a small (128GB) SSD to store the OS and other important programs so that they can be loaded quickly. I would also suggest a larger HDD, around 1-2 TB for mass storage.

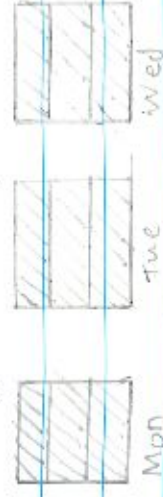
d) It is very important that the PC has plenty of USB 3.0 ports for peripherals like a graphic design tablet. As well as potentially a card reader for removable storage such as SD cards.

e) I would suggest that the chosen ~~GPU~~ GPU has HD video output such as HDMI or Display Port as well as a reasonable amount of video memory. 4GB should be plenty.

4.

a) Full Backups

A full backup of all data is taken every day. When a restore is needed you only need the previous day's backup



Incremental Backup

Differential

An incremental backup works by taking a full backup weekly and then daily backups of what has changed since the last full backup. A restore requires the last full backup and every backup since then.



Differential Backup

* This works by taking a full weekly backup and then backing up only ^{data that} ~~data~~ has changed.

b)

i) Magnetic tape has the advantage of being cheap as well as reliable but they are fairly slow. 2

ii) Optical media is ~~very~~ fairly cheap and highly available ~~but~~ but has the disadvantages of having a fairly low storage capacity as well as being pretty fragile as they can scratch easily. 2

iii) An EHD has the advantage of being very cheap per GB of storage meaning ~~to~~ large EHDs are affordable. ~~A~~ A disadvantage could be that they aren't very drop proof and can suffer performance issues if any contaminants get onto the platters or RW head. They are also comparatively slow. 2

iv) SANs have two big advantages. They can be incredibly fast and they can be accessed by a number of devices. One disadvantage of SANs is that they are very expensive compared to other solutions. Another disadvantage is that they are not ~~portable~~ portable. 2

v) Flash drives are very cheap and ^{usually} highly portable. Unfortunately they are ^{not} very sturdy and can be easily broken. They are also ~~the~~ comparatively slower when compared to SANs and ~~network~~ optical media.

2

Surname

HARRISON

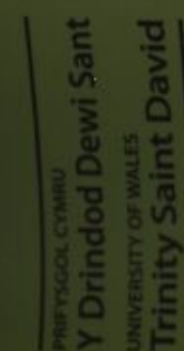
(Block Capitals) Forename(s)

ANDREW

Please complete this section and SEAL before the examination starts.

Complete
sections
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and SEAL

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Y Drindod Dewi Sant

Trinity Saint David

Examination Answer Book

12 Pages

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1	Student Number	855771	Office Use	
2	Title of Examination Paper	Computer Science	List the numbers of the questions you have attempted	1
3	Module Code	ACCA700		2
4	Date and Time of Examination	10/02/2011 08:30		3
5	Examination Venue	G45		4
6	Seat Number			
7	Number of Answer Books handed in	1		
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$$i) \quad 27 = 16 + 8 + 4 + 2 + 1 = 11011 \quad \checkmark$$

$$b) \quad 115 = 128 - 64 + 32 - 16 + 8 - 4 + 2 - 1 = 115$$

$$ii) \quad a) \quad 128 \begin{array}{|c|c|c|c|c|c|c|c|} \hline 0 & 0 & 1 & 1 & 1 & 1 & 1 & 1 \\ \hline \end{array} \begin{array}{|c|c|c|c|c|c|c|c|} \hline 64 & 32 & 16 & 8 & 4 & 2 & 1 & 1 \\ \hline \end{array} = 128 + 31 = 159$$

$$b) \quad 128 \begin{array}{|c|c|c|c|c|c|c|c|} \hline 0 & 0 & 1 & 0 & 1 & 0 & 1 & 1 \\ \hline \end{array} \begin{array}{|c|c|c|c|c|c|c|c|} \hline 64 & 32 & 16 & 8 & 4 & 2 & 1 & 1 \\ \hline \end{array} = 39$$

$$iii) \quad a) \quad BA = B = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 1 \\ \hline \end{array} \quad A = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 0 \\ \hline \end{array}$$

$$BA = 128 \begin{array}{|c|c|c|c|c|c|c|c|} \hline 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 \\ \hline \end{array} \begin{array}{|c|c|c|c|c|c|c|c|} \hline 64 & 32 & 16 & 8 & 4 & 2 & 1 & 1 \\ \hline \end{array} = 1011010$$

$$b) \quad C3 = C = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 0 \\ \hline \end{array} \quad 3 = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 1 \\ \hline \end{array}$$

$$C3 = 11000011$$

$$iv) \quad a) \quad 38 = 128 \begin{array}{|c|c|c|c|c|c|c|c|} \hline 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 \\ \hline \end{array} \begin{array}{|c|c|c|c|c|c|c|c|} \hline 64 & 32 & 16 & 8 & 4 & 2 & 1 & 1 \\ \hline \end{array} = 63 \quad \times$$

$$b) \quad F6 = F = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 1 \\ \hline \end{array} \quad 6 = 8 \begin{array}{|c|c|c|c|} \hline 4 & 2 & 1 & 0 \\ \hline \end{array}$$

$$F6 = 128 \begin{array}{|c|c|c|c|c|c|c|c|} \hline 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 \\ \hline \end{array} \begin{array}{|c|c|c|c|c|c|c|c|} \hline 64 & 32 & 16 & 8 & 4 & 2 & 1 & 1 \\ \hline \end{array} = 80 + 60 + 6 = 246$$

V) $2^6 - 32 - 1 = 31$ different values. ✓

Vii) $8 \times 3 = 24 \text{ bits}$ 8 bits = 1 Byte. 24 bits = 3 Bytes. ✓

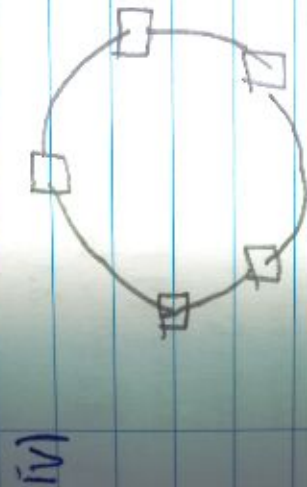
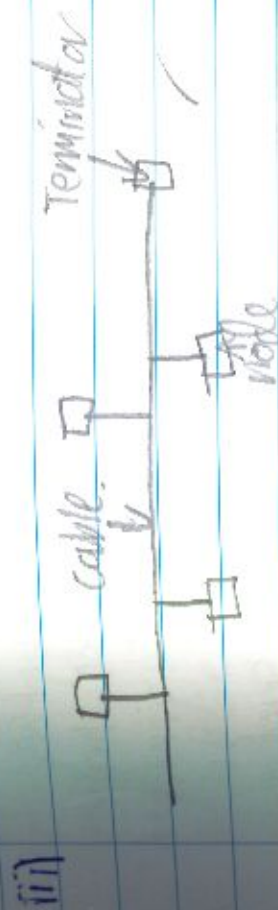
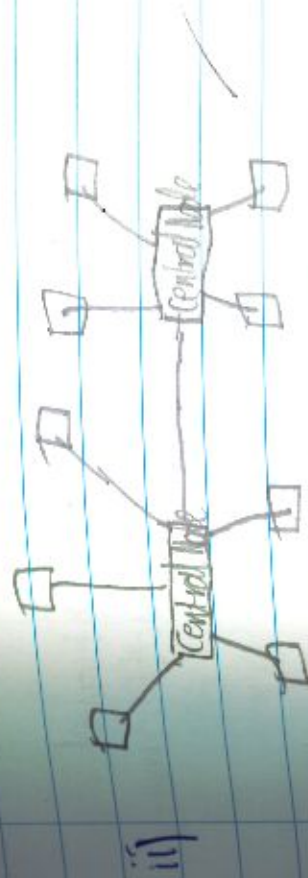
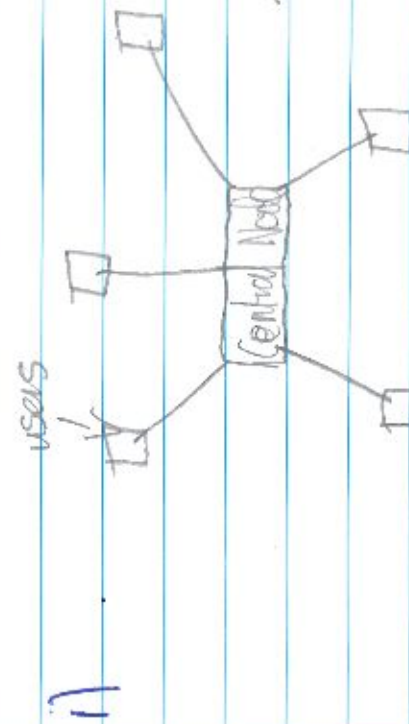
$600 \times 400 = 240,000 \times 3 = 720,000 \text{ Bytes}$ ✓

Viii) The compression ratio for JPG is 10:1. So the BMP file would be reduced to around 72,000 Bytes. ✓

2a)

Application = Layer 7 } User end
 Presentation = Layer 6 }
 Session = Layer 5 }
 Transport = Layer 4 }
 Network = Layer 3 }
 Data Link = Layer 2 }
 Physical = Layer 1 }

b)



c) Frames have MAC addressing and is in the Data Link Layer. ✓

Packets have IP addressing and is located in the Network Layer. ✓

Segments have Port addressing and is located in the Transport Layer. ✓

d) Simplex is where data can only travel one way to its destination, and not come back to its sender.

Half-Duplex is where data can be sent and received but not at the same time. If the data is being transmitted to the receiver it ~~cannot~~ cannot send data back until the original data transfer has finished.

Full-Duplex is where data can be sent & received at the same time, and so if data from the receiver needs to be sent back to the sender it can even whilst the sender is transmitting data to the receiver.

3a) A Suitable CPU for a high-end Graphics PC would be an Intel i7 because it has ~~better~~ ^{great} processing power and it also quad-core and has multiple threads which means it can handle a lot of processes at once from programs. This is ideal for programs like Photoshop, Illustrator, etc.

b) A sensible amount of RAM would be 32GB. Because if you have many instances of Photoshop, Illustrator, etc. It will ~~start~~ take up RAM and slow your PC down to the point of the program crashing. That's why if you have 32GB your PC would be smooth when editing photos.

c) I would choose to have a 250GB SSD for the operating system and the installation of the programs. But I would also have a 2TB SATA drive for the actual files stored as if you stored them in the SSD it would be full of memory very quickly as graphics can be very large files especially if you're going for high-quality images. I would suggest 2TB because it's a very large capacity which means you can store much more images and be able to keep the image quality.

d) For the input/output & parts required I would recommend a keyboard, mouse, graphics tablet, high-quality monitor & scanner. I recommend these devices because you will need the keyboard & mouse to navigate around the PC. The graphics tablet for sketching or editing images. A high-quality monitor so that you can really see the colours and any areas that need adjusting. Also a scanner for getting actual photographs scanned in a high quality directly to your PC. The parts you will need are USB for the keyboard, mouse and the connection between the PC and scanner. Also need HDMI port for the monitor as HDMI gives you a much better image quality compared to DVI, VGA, etc.

e) A Suitable Graphics Card would require a HDMI Port to connect the monitor to the PC. Have a large amount of RAM as Photoshop/Illustrator are very heavy users of RAM. Also have a fast running Speed to be able to handle the programs.

4a) Full backup is where the whole system is backed up from the server to an external drive potentially it's the slowest type of backup because it has to copy the whole system. But when it comes to restoration it's the quickest as you will only need the latest full backup.



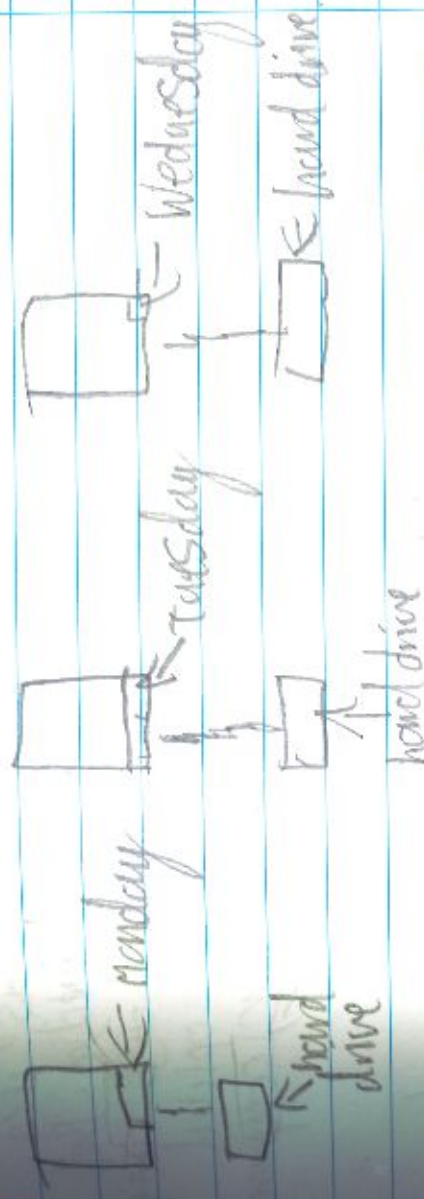
For every day.

Differential backup is where it only backs up the changes since the last full backup. For restoration you would need the last Differential Backup & the last full backup.



changes on Monday
Since last full backup

Incremental Backup is the a backup where it only copies the changes since the previous day. This can be very problematic when it comes to restoring the system as it would need the last full backup & every day after the last full backup to restore.



b) The advantages of using

1) Magnetic tape is beneficial due to it being useful for older systems and if the data was stored correctly couldn't be changed unless it was damaged. But if the tape was damaged then all of the data would be lost and cannot be recovered. Also it cannot hold large amounts of data.

i) The advantages of using optical media is that it can hold a relatively large amounts of data and also can be very attainable in the current world. But with optical media the data can be corrupted via a scratch on the media which then renders the media useless. Scratches can occur when the drive has a sudden jerk and the media may move towards the read/write head and then as it's sharp, it will scratch the media. But also the optical media is portable and can be easily transported off-site. But the optical media doesn't have the storage power compared to a hard drive for example.

ii) External hard drives are very good types of backups as they are portable which means that they are ideal for off-site storage. It also holds a vast amount of storage capacity. Also is much less likely for the data to be corrupted.

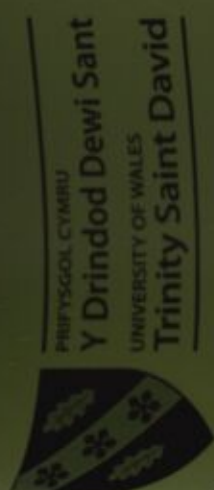
iii) Storage Area Networks can be used as backup media as they are interconnected to the system which means that it is easier & faster to backup as it's within the network. But if the whole system is down then you may not be able to access the network. For restoration also not portable.

iv) USB flash drives can be used as they are very portable and with USB can connect to the system very quickly. But the storage capacity are very poor and not ideal for backing up files. It also got lost easily due to the sheer size of them, as they can fit in the palm of your hand.

Surname **AUSTIN**(Block Capitals) Forename(s) **ASHLEY DAREN**

Please complete this section and SEAL before the examination starts.

(Gweler yr ochr arall am y SEAL Cymru)



Examination Answer Book

12 Pages

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1	Student Number	15541	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	Computer Arch.	1	27
3	Module Code	1004004	2	41
4	Date and Time of Examination	18/02/11 11:15	3	31
5	Examination Venue	Comp. Sci. - Bwr	4	6
6	Seat Number	V/N		
7	Number of Answer Books handed in		Total	67



PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgaiswyr

1. Rhwch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarperir i'r dde a selwch i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgriflen ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu sgrifl annarllennadwy, neu drefnu iddi gael ei theipio a chael yr ymgaisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddyn.
6. Ni ddylid rhwgo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyliwr/gwyliwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyriwr		Rhesurwch rhifau'r cwestiynau a ymgeisiwyd gennych	At Ddibenion y Swyddfa
2	Tcill y Papur Arholiad			
3	Cod y Modwl			
4	Dyddiad ac Amser yr Arholiad			
5	Lleoliad yr Arholiad			
6	Rhif Sedd			
7	Nifer y Llyfrau Atebion a gyflwynwyd		Cyfanswm	

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Llenwch y
man hon,
tynwch y
sitrôl
plyguwch fel
a ddarparir
a SELIOCH

Q1.

i) Decimal to Binary

a) 27

128	64	32	16	8	4	2	1
0	0	0	1	1	0	1	1

$$27 - 16 = 11 - 8 = 3 - 2 - 1 = 0$$

$$27 = 11011$$

b) 115

128	64	32	16	8	4	2	1
0	1	1	1	0	0	1	1

$$115 - 64 = 51 - 32 = 19 - 16 = 3 - 2 - 1 = 0$$

$$115 = 1110011$$

ii) Binary to Base 10

a) 10011111

128	64	32	16	8	4	2	1
1	0	0	1	1	1	1	1

$$\begin{array}{r} 128 \\ + 16 \\ \hline 144 \\ + 8 \\ \hline 152 \\ + 7 \\ \hline 159 \end{array}$$

$$10011111 = 159$$

6) 0010 0111

128 64 32 16 8 4 2 1
0 0 1 0 0 1 1 1

32

+ 7

39

0010 0111 = 39

iii) Hex to Binary

a) BA

8 4 2 1
B 1 0 1 1
A 1 0 1 0

BA = 1011 1010

b) C3

8 4 2 1
C 1 1 0 0
3 0 0 1 1

C3 = 1100 0011

Hex Values

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F

iv) Hex to Decimal

a) 3B

8 4 2 1
3 0 0 1 1
B 1 0 1 1

128 64 32 16 8 4 2 1
0 0 1 1 1 0 1 1

32 48 56

+16 + 8 + 3

48 56 59

3B = 59

b) F6

8 4 2 1
F 1 1 1 1
6 0 1 1 0

128 64 32 16 8 4 2 1
1 1 1 1 0 1 1 0

128 192 224 240

+64 + 32 + 16 + 6

192 224 240 246

F6 = 246

v) The values that can be represented include:

2, 4, 8, 16, 32 and 64

vi) $600 \times 400 = 240000 \times 3 = 720,000 \text{ bytes}$

viii) 720,000 compressed by a scale of 10:1 would be approx 72,000 bytes.

Q2.

a) Application

Presentation

Session

Transport

Network Access

Data Link

Physical

b)

i) Star



ii) Extended Star



iii) Bus



iv) Ring



c) Application

Presentation

Session

Transport - Frames

Network Access - Packets

Data Link - Segments

Physical

d) Simplex is when data can only travel one way at a time. Therefore if you are sending a file you cannot receive a file simultaneously and vice versa.

Full duplex is when data can be sent across a network either way, Simultaneously. Meaning you can both send and receive files within a network without having to wait for another transfer.

Half duplex is when data transfer can go either way across a network although only one at a time. For example, if you are receiving a file you will have to wait for that transfer to be complete before you can send a file across the network.

Simplex means that data can only be sent one way across a network. For example you may be able to send files to the network, but not receive them.

Q3.

a) Since this computer is aimed at "high-end" graphic design work, I would suggest a CPU with multiple cores, to spread the heavy load of any graphic design software more evenly. A suitable power range that I would suggest would be around 3.5 to 4.0 GHz, as this will provide you with more than enough power to withstand a graphic design program. I feel that an Intel i5 would be a suitable option to fit this criteria.

b) The software that may be used for this PC may demand a sizeable amount of RAM. Whilst also taking into consideration many programs or tabs may be open at any given time I feel that anywhere within the range of 8 to 16 GB would suffice. Preferably DDR4 RAM due to the potential speed that you could achieve, this will be especially important as you will want the programs to run smoothly and efficiently.

c) Since we are mainly working with graphic design I feel that a sizeable hard drive would be required. Such as 2TB, you would also feel that this is appropriate because the file sizes when working with graphic design can be quite large. Leaving room for further expansion would also be a good consideration. + ~~there~~ ~~over~~ a solid state hard drive as I feel it would have been a needless You may also want to consider a small solid state drive, for the operating system and some of the more important

pieces of software that you use. I would recommend a capacity such as ~~256~~ 254GB, this will leave appropriate room for the operating system (for faster startup times) and useful graphic design software (to help with its performance).

d) USB 3.0 would be very important for this PC as you would need to run devices such as a graphics tablet. Ensuring that this peripheral functions to its best potential will aid graphic design software usage for the user. Additional peripherals such as a mouse and keyboard would also be required.

e) For graphic design it relies heavily on the graphical capabilities of your machine. Therefore, consideration of a graphics card with at least 4GB of VRAM is a requirement to handle all of the potential software this machine will have to run.

Q4. The three main types of back up include:

- Full Backup
- Differential
- Incremental.

Full Backup



Mon Tues Wed Thurs Fri Mon Tues etc.

A full backup is when all of the files on the network are saved every day (not including

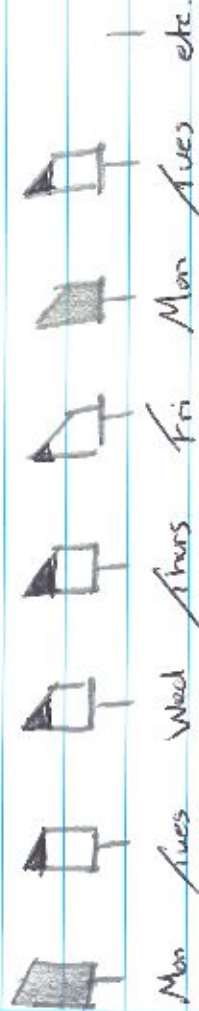
non work-days e.g. Sat / Sun). A new tape will be used every day to fully back up the network.

Differential



A Differential backup has a set rotation on one day of one week. In this example every Monday there is a full backup, in the subsequent ~~several~~ days only the new or changed files are added to the backup (as seen by the black in the diagram). This rotation will continue, ensuring that there is a full backup every Monday.

Incremental



An incremental backup is when a full backup will occur once a week. In this example, on Monday, then for one following day any new files on the network are backed up daily. This does not carry into the following days, unlike differential. Instead a new tape is used for backup, each day of the week.

b) USB Flash Drive

Advantages / Disadvantages

- Portable
- Generally has a lower capacity
- Prone to corruption if not used correctly

External Hard Drive

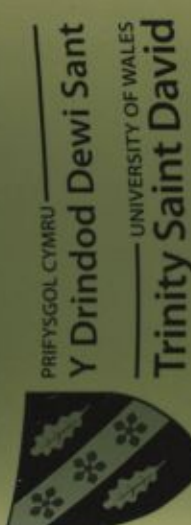
Advantages / Disadvantages

- Portable
- Can have a large capacity
- Tends to be quite fragile

Surname **DAVIES**

(Block Capitals) Forename(s) **DANIEL WYN**

Please complete this section and SEAL before the examination starts.



Examination Answer Book

12 Pages

Instructions to candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right and seal to hide your name.
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6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

1	Student Number	79762	Office Use	
2	Title of Examination Paper	Computer Networks	1	24
3	Module Code	ACC4001	2	24
4	Date and Time of Examination	8.07.2018	3	13
5	Examination Venue	Colby St. Gars	4	12
6	Seat Number			
7	Number of Answer Books handed in		Total	73

(Gweler yr ochr arall am y fersiwn Cymraeg)



Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

1. Rhwch yr holl wybodaeth y gofynnir andani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarperir i'r dde a selwch i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgrifen ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu sgript annarllennadwy, neu drehu iddi gael ei theipio a chael yr ymgeisydd i dalu.
4. Y sgrifennwch eich atebion mewn inc.
5. Dechreuwch bob arwb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thymu llinell drwyddynl.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyliwr/gwyliwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyrwr		Rhestrwch rifau'r cwestiynau a ymgeisydd genych	At Dibenion y Swyddfa
2	Tieil y Papur Arholiad			
3	Cod y Modwl			
4	Dyddiad ac Amser yr Arholiad			
5	Lleoliad yr Arholiad			
6	Rhif Sedd			
7	Nifer y Llyfrau Atebion a gyflwynwyd			Cyfanswm

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Llenwch y man hon, bwrwch y sgrïp, pwywch fel a ddarperir a SELIWCH

Application

Q2. Perspiration

Preparation

Session

Temperature

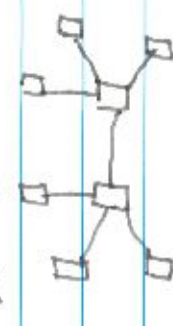
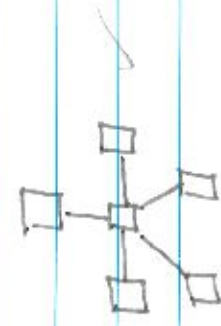
Network Policy IP

22

DirectLink Flame, MAC

MAC

Physical Bits



(2) Fines are up to 1000 Euro ~~and~~ ^{per} ~~it~~ ^{for} ~~double~~ ^{double} ~~tax~~ ^{tax} ✓

Functions are in the network layer

Segments are at the Transport layer

Q2d) Half duplex occurs when two network devices are connected to one and other but can only Transmit or Receive data, so when one device transmits the other can only receive and vice versa. Simplified it when a device can only either transmit or receive data and cannot do the opposite of which they can do. e.g. a TV only receives signals it does not transmit in most cases. Full duplex is when a device can ~~before~~ both transmit and receive at the same time.

For a high-end CPU for graphic design I would consider a processor with at least ~~3.5 GHz~~ 3.5 - 4.5 GHz and that's the CPU by Intel i7 or i9. So that it can handle complex cultural and further applications.

A sizable amount of RAM for a telegraphic design PC would be ~~at least~~ 16-32 GB as it can cause slowdown if an image not runny layers of when rendering CGE and RAM can help the program run faster.

For non volatile storage I would suggest either 2 4TB HDD's and an SSD of about 240 GB as compressed physical images and high density media can take up a large amount of space on a harddrive. The SSD would house the OS and the programs the user is working with to reduce loading times of programs and start up.

I would suggest around 4 USB 2.0/3.1 ports on the front panel. So if one user can attach graphics tablets and other accessories to the front of one PC, I would also recommend having a free Ethernet port for network access and a 3 or 5 or 30 ports on the back for the keyboard and mouse, 2 or more HDMI ports may also be required if using multiple monitors but this is covered by the graphics card.

A suitable graphics card should have minimum of 2 GB RAM + 4 GB VRAM for better detail or multi monitor set-ups. It must also have 6GB or more of VRAM if the user is interested in creating very high resolution ~~images~~ of images.

	Mon	Tue	Wed	Thur	Fri
Full backup					
incr backup					
each type is followed					

A Full backup occurs when all the selected files on a network are backed up once. Such as Tape every day. ✓

	Sun	Mon	Tue	Wed	Thur	Fri
Incremental						
An incremental backup only backs up changes to ^{data} ~~files~~ on each day but has a full backup on the Friday.						

Q4a. Differentiate between the web the data backup taking the data changes and saving (recovery) data each day until a full backup is made at Friday.

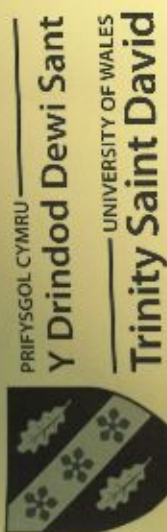
Q4s.i Magnetic Tape is transportable meaning it can be moved from place to place easily. It can store up to 130 GB of data allowing for large backups to be made. If the tape is damaged the data can be lost or damaged.

ii. Optical media can be easily purchased and is widely used. There are many types of optical media as some can only read data such as CD-R and others can only be written to, CD-RW as an example. Most kinds of optical media cannot support large data as they do not have the capacity to hold as much as tape. They are easily broken or scratched which can cause data loss.

iii. External hard drives are very reliable and can be used via USB ports in most cases. Fairly inexpensive in comparison with tape but have slow read and write speeds.

iv. Storage Area Networks or SAN are useful as they can allow for a user's files to be stored on a network rather than their workstation drives allowing them to access their files across any device which can connect to the network and buy the correct access. This does open data up to hacking and unauthorised access so access the data so it needs good security measures to be effective.

v. A USB Flash Drive is very reliable as they are small in size and can be utilised via a single USB port. They are designed for backing up of specific files such as word documents or small source files, as most are around 8GB in size. Due to the small size they are very easy to misplace but can also be cheap to replace if lost or broken.



Examination Answer Book

12 Pages

Instructions to candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right and seal to hide your name.
3. The answers must be **legibly** written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
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6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

1	Student Number	55199744	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	Computer architecture and networking	1	17/13
3	Module Code	ACC A4001	2	6
4	Date and Time of Examination	17/11/2018 5.38-7.08	3	12/13
5	Examination Venue	G-45	4	7
6	Seat Number			
7	Number of Answer Books handed in	1	Total	42

(Gweler yr ochr arall am y fersiwn Cymraeg)



PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

1. Rhwng yr holl wybodaeth y gofynnir andant yn y blychau isod.
2. Rhwng eich enw yn y lle a ddarperir i'r dde a seliwch i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgrifen **ddarlennadwy**. Gall yr Arholiwr naill ai anwybyddu sgript annadlenadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw ffas nodiadau yn y llyfr atebion a llynnu llinell drwyddylt.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwylthir/gwylthyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyrwr		Rheswch rffau'r cwestiynau a ymgeisydd genych	At Ddiabention y Swyddfa
2	Teitl y Papur Arholiad			
3	Cod y Modwl			
4	Dyddiad ac Amser yr Arholiad			
5	Lleoliad yr Arholiad			
6	Rhif Sedd			
7	Nifer y Llyfrau Atebion a gyflwynwyd			Cyfanswm

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Question 1

	12	8	64	32	16	8	4	2	1
27	0		0	0	1	1	0	1	1
115	0		1	1	1	0	0	1	1
159	1		0	0	1	1	1	1	1
39	0		0	1	0	0	1	1	1
BA									
C3									
3B									
F6									

i) 0001 1011 ✓
0111 0011 ✓

6✓

ii) 159 ✓
39 ✓

6✓

iii) 1011 1010 ✓
~~1011~~ 1110 0111

2✓

iv) 24 ✓
21 ✓

v) 36 ✓

vii) $600 \times 400 = 240000$
 $24 \times 3 = 7200.00$
 $\frac{240000}{7200.00} = 33.33$

1✓

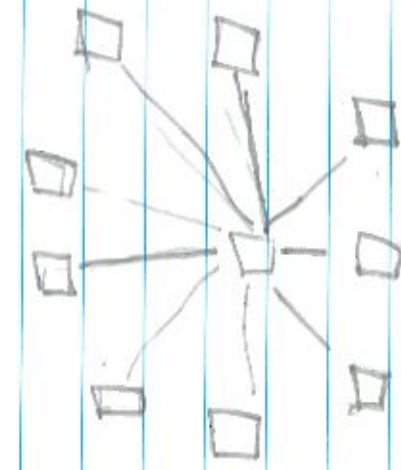
viii) Once compressing into a JPG it has a Compression rate of 10:1 meaning the File would be 7200 bytes.

2✓

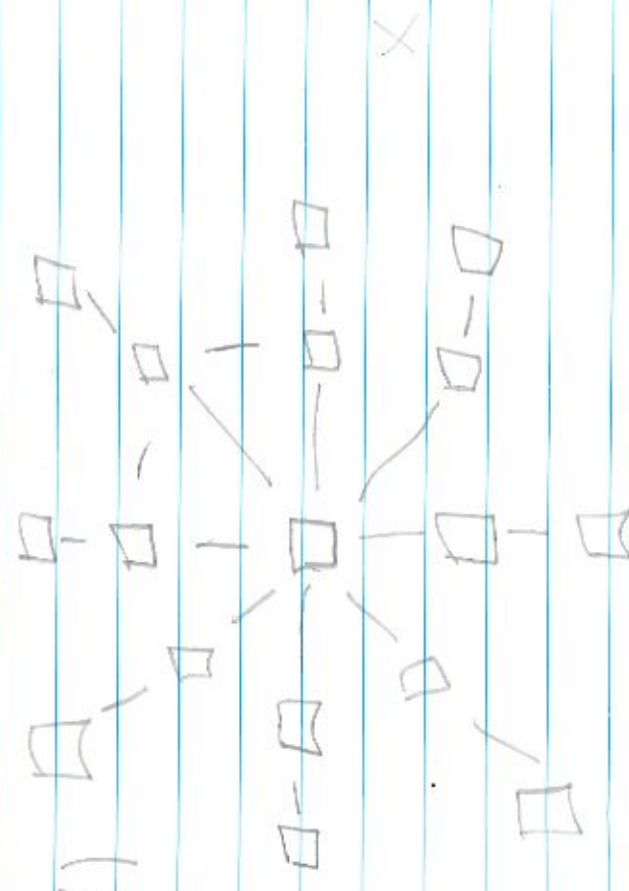
Question 2

a) TCP/IP
DHCP

b)



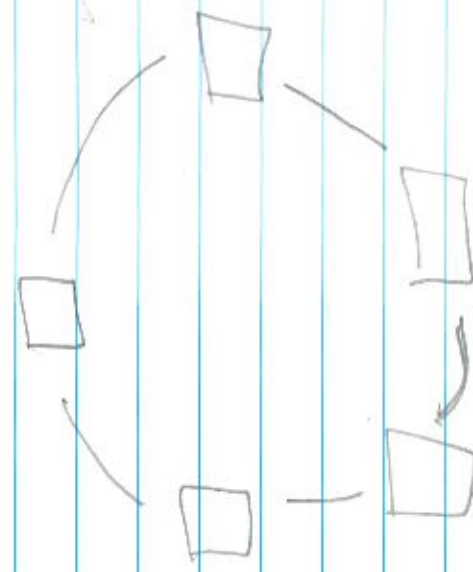
c)



iii)



iv)



c) ~~Nodes are deleted with the~~

Packets are deleted with in the DHCP layer as the packets are passed along to the IP address which is established in the DHCP layer.

d)

QUESTION 3

For a high end Graphic design PC i would recommend using the following specifications on the hardware

A) CPU - i would use a i5 Quad core / Processor as a graphic designer would use ~~for~~ multiple applications which would put strain on the Processor so having Quad core would take the strain ~~off~~ OFF. i would use an i5 as it would handle better than an i3 as you wouldn't want the system to crash.

B) RAM - For memory i would use a 12 GB / as ~~the~~ i explained earlier it would ~~not~~ take a lot of the strain off compared to an 8 GB. The more Ram the more fluent tasks will seem as it would be able to handle it.

C) Storage - i would install the ~~the~~ operating system on a ~~SSD~~ SSD as they perform faster than being on the computers hardrive. Leaving a 2TB hardrive as a ~~storage~~ storage unit to be able to hold the Graphic design files on the system.

D) Input / outputs - As a graphic designer would need other tools other than the standard monitor, keyboard, mouse they may need extra ports for a click ball alternative than a mouse as long useage puts leads to RSI people prefer a click ball. A DrawPad in which instead of using a mouse for drawing, a digital drawpad would make it easier for the graphic designer to be more detailled say if she/he was to use an actual pencil/pen.

E) Graphics Card - As it is a graphic designer PC it should have a top of the range GeForce 1080 graphics card to utilise their work so they are not being held back by the PC's requirements.

QUESTION 4

Full BACK UP

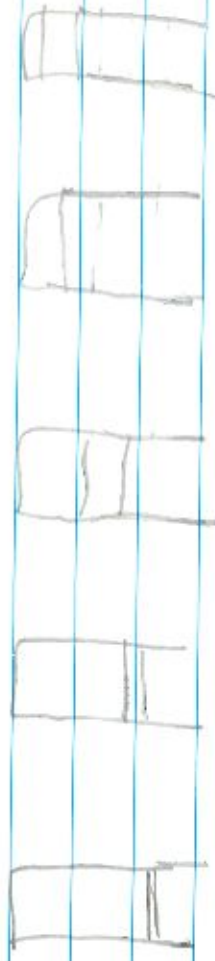
Mon Tue Wed Thurs Fri

Sat Sun

~~This method takes longer but it is more effective or recovering the~~
This is the most effective backup

In My eyes as it is the most secure IF data is lost you can obtain the most recent days backup to return it to that state.

Incremental backup



This backup method only backs up the previous days along with today's backup.

Differential backup



This method backs up that day alone meaning if data is lost and needs retrieval each tape would have to be loaded.

~~Answer~~

B) i)

ii)

iii) External harddrives are large storage devices which can hold 100's of GB even TB's. This is a benefit as they can hold many large different file types for programs which hold large files. Disadvantage of external harddrives are that they are easily damaged due to their size and weight they are not as travel friendly as other devices. Also it takes up as a USB stick which may be an issue if using a laptop with minimal USB slots.

iv)

v) USB Flash drives are good because they are easy to carry around due to their small size. Also from their size they can also carry a lot of data. 32 GB sticks are commonly available which is plenty if you use it for photos of word files etc. drives are almost instantly installed so so

They are perfect for on-the-go use
Disadvantages are they can be
fragile and are prone for corruption.
Also as it is a USB device it
takes up a slot which may be an
issue if you have other USB
components plugged in.

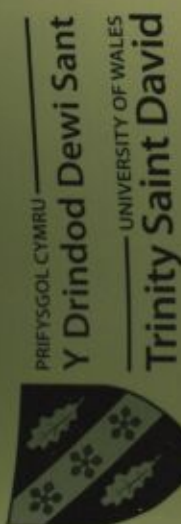
Surname

Reever

(Block Capitals) Forename(s)

Ashley

Please complete this section and SEAL before the examination starts.

REMOVE
STRIP, DO NOT
TEAR OFF
COMPLETE
FOLD

Examination Answer Book

12 Pages

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1	Student Number	AL1618066	List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	Comp Arch + networking	1	23
3	Module Code	ACCA1001	2	21
4	Date and Time of Examination	18-11-18	3	11
5	Examination Venue	53-4	4	10
6	Seat Number	N/A		
7	Number of Answer Books handed in		Total	59

(Gweler yr ochr arall am y fersiwn Cymraeg)

PRIFYSGOL CYMRU
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Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

- Rhowch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
- Rhowch eich enw yn y lle a ddarperir i'r dde a seliwch i guddio eich enw.
- Rhaid i'r atebion fod newn llawysgrifen ddatlennadwy. Gall yr Arholiwyd naill ai anwybyddu sgrïpt amallennadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
- Ysgrifennwch eich atebion newn linc.
- Ddechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnwch llinell drwyddynl.
- Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
- Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwybwr/gwyfwr.
- Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyrwr	Rhestrwch rifau'r cwrsiau a ymgeisiwyd gennych	At Ddibenion y Swyddfa
2	Teitl y Papur Arholiad		
3	Cod y Môdwl		
4	Dyddiad ac Amser yr Arholiad		
5	Lleoliad yr Arholiad		
6	Rhif Sedd		
7	Nifer y Llyfrau Atebion a gyflwynwyd	Cyfanswm	

(See the other side for English version)

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Llenwch y rhan hon, tymchwch y sribyn, plygwch fel a ddarperir a SELIWCH

Decimal to flex binary

Figure 2.

3
1145212
$$16 + 8 = 24$$

Figure 1

$$\begin{array}{r} 128 \text{ } 15 \\ 16 \overline{) 144} \\ 144 \\ \hline 0 \end{array}$$
$$32 \frac{7}{39}$$
$$38 = 0011011 = \frac{32}{+16} + \frac{2}{+1} = \frac{48}{59}$$
$$f_6 = 1110111 = \frac{128}{64} = \frac{32}{16} = \frac{8}{4} = \frac{2}{2}$$

Question 1

$$A \quad 2H = 00011611$$
$$115 = 01110011$$

Question 2

A	10011111	= 159
---	----------	-------

B	0010 0111	= 39
---	-----------	------

Question 3

A	BA = 1011 1010
---	----------------

B	C3	1100 0011
---	----	-----------

Figure 2

Question 4,

A, $3B = 59$

B, $F6 = 244$

Question 5,

A 6 bit number can represent a total of 31 unique values

Question 6,

$$600 \times 400 = 240000 \times 3 = 720000$$

Question 7,

$$720000 \div 10 = 72000$$

Speeg compression is normally at a rate of 10:1

Question 2

A,

B,

Star

Extended star

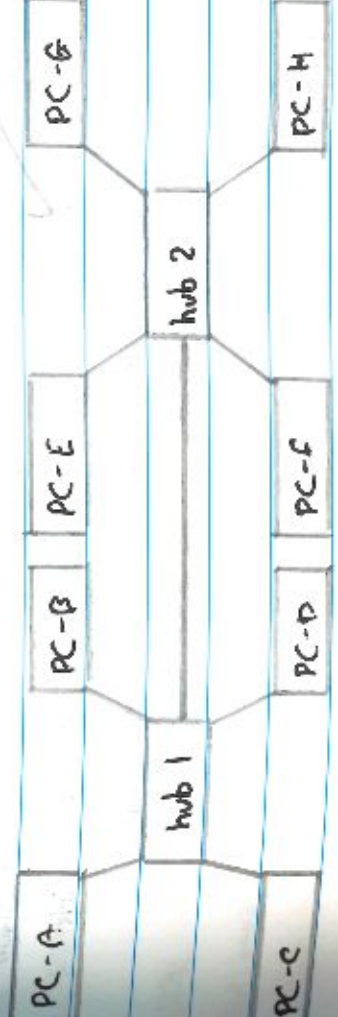
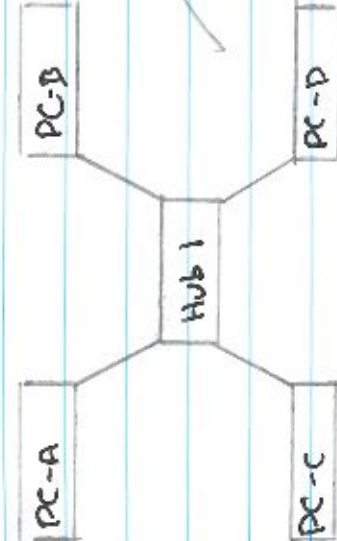
	128	64	32	16	8	4	2	1
3	0	0	1	1	1	0	1	1
F	1	1	1	1	0	1	1	1

Figure 2.

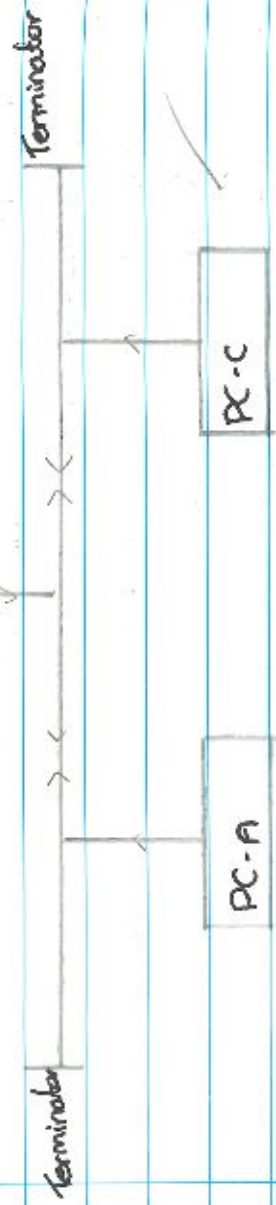
$$\begin{array}{r} 128 \ 32 \ 16 \\ + 64 \ 16 \ 48 \\ \hline 192 \ 48 \ 240 \\ + 240 \\ \hline 432 \end{array}$$

Question 2

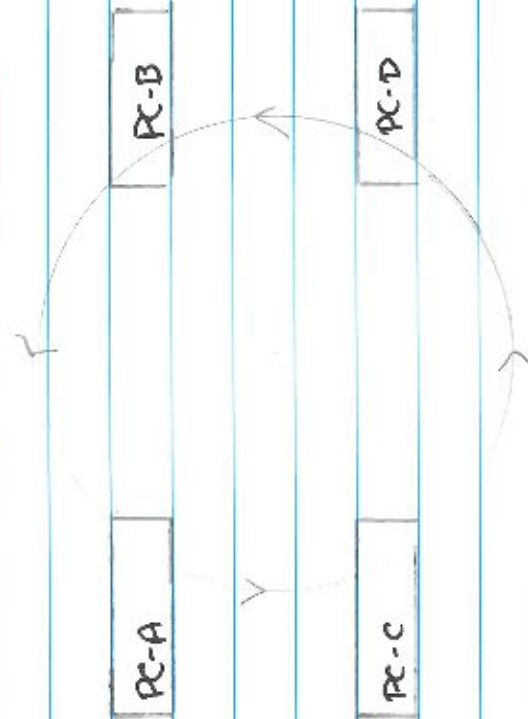
	4	Application
6	6	Presentation
5	5	Session
4	4	transport
3	3	network
2	2	Datalink
1	1	Physical



Bus,



Ring,



C,

Frames = Data link, level 2 of the OSI model.

Packets = network, level 3 of the OSI model.

Segments = transport level 4 of the OSI model.

D, half Duplex = is a form of communication but only in 1 direction

Full Duplex = is another form of communication, but it's possible

for two way communication to happen at the same time

half Duplex - walkie talkie

full duplex - phone calls

Simplex -

Question 3,

- E, GPU, - Nvidia Titan X, 6-core, 12gb
- D, RAM, - Corsair 8gb 4x8gb DDR4
- A, CPU, - Intel core i7 8700 series, 6 core, 4.6mhz not overclocked.
- C, storage - 2TB HDD, + 128gb SSD
- E, Ports - HDMI, USB 2.0, USB 3.0, microphone input

Reasoning,

the reason I choose the intel core i7, was based on mainly on the standard 4.6mhz frequency and with this CPU having 6 cores, over a CPU with less such as a quad core. the reason I choose the non-overclocked version was because I wanted a cooler and quieter setup, as this setup would be positioned in a work place.

the reason I went for 32gb of ram, from my research on a recent assignment, I found graphic designers require more ram than a standard PC workstation, I choose DDR4 over DDR3 ram for having a higher transfer speed.

My reasoning on the 2tb HDD is to provide the user with ample storage for projects, I choose the 128gb SSD, to allow the user to store the operating system on here for quicker start up times. the SSD could also be used to run such software as Visual basics as this application would work much faster than if it was stored on a HDD.

GPU, I decided on the Nvidia Titan block because of the 12GB, and the massive 3840 cores this GPU has which would result in a faster setup for the user, also this GPU would not have to be upgraded for some time.

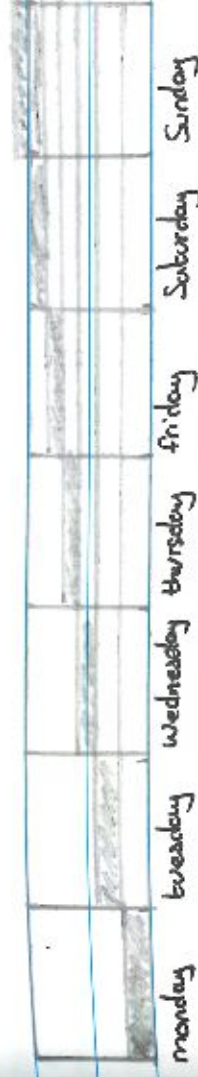
ports needed are usb 2.0 for keyboard + mouse input, but could also be used for web cam utilization which would be an advantage for most workstations, USB 3.0 was chosen for its higher transfer speed than usb 2.0, which would be another advantage for the user. HDMI, was selected to run the monitor output, the Nvidia titan can easily manage upto 4 displays, which is another reason that particular GPU was selected.

Question 4,

Backup types,

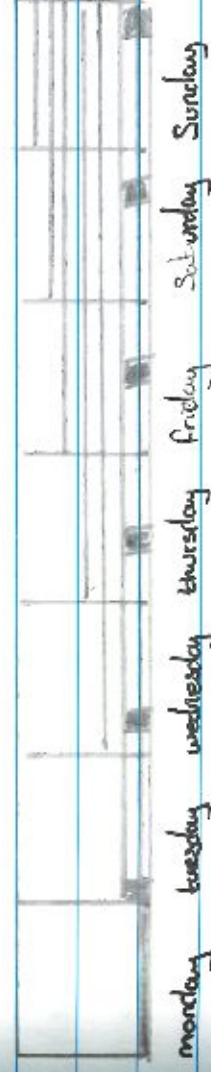
Differential, incremental, and full

Full



Full back up is when you back up everything on the network
 pro - easily recoverable data - less tapes for a restore
 Con - multiple copies of the same data, poor space management.

incremental



incremental back ups only backs up the information that has changed since the last incremental back up took place.
 in the diagram a full backup was done on monday

Con - multiple tapes, pro - no multiple copies of data
 Differential.



A differential back up only backs up the data that has changed since the last Full back up. A full back up was done on monday
 Con - multiple copies of data, multiple tapes
 pro -

B,

optical has the advantage that the information stored on a disk is permanent, and easily transported, cheap to implement, easy to use, but they can be fragile, and storage can be limited and used up quickly.

2/

SAV has the advantage of being able to be accessed from multiple locations, easy to implement

1/

the disadvantages are that if the server that is hosting the storage is corrupted or fails you loose access to the backup files, can be expensive to operate.

External hard drives for the use with file back up have the advantage of being fairly compact and hold a large amount of information.

2/

- easy to use

disadvantages that they are fairly fragile and can be expensive to purchase.

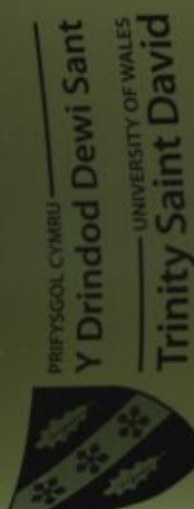
- need multiple HDD to store a large amount of information.

Surname Howden(Block Capitals) Forename(s) Oliver

Please complete this section and SEAL before the examination starts.

Complete
section,
remove
indicated
strip and
seal as
shown

FOLD



Examination Answer Book

12 Pages

Instructions to candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right and seal to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

1	Student Number	136977	Office Use	
2	Title of Examination Paper	Cam Pwrer Architecture and Networking	List the numbers of the questions you have attempted	Q1 20 24 27 28
3	Module Code	ACCA 400 1		
4	Date and Time of Examination	17 th January 2018 08:30		
5	Examination Venue	6.10.19		
9	Seat Number			
7	Number of Answer Books handed in	1	Total	99

(Gweler yr ochr arall am y fersiwn Cymraeg)

PRIFYSGOL CYMRU
Y Drindod Dewi Sant
UNIVERSITY OF WALES
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeisywyr

1. Rhwch yr holl wybodaeth y gofynnir andani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarperir i'r dde a seliwch i guddio eich enw.
3. Rhaid i'r atebion fod mewn llawysgriflen ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu sgrifft annarllennadwy, neu drehu iddi gael ei threipio a chael yr ymgeisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fräs nodiadau yn y llyfr atebion a thynnau llinell drwyddynt.
6. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyliwr/gwyliwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

1	Rhif Myfyriwr	Rheswch rhifau'r cwestiynau a ymgeisydd geinych	At Ddbenion y Swyddfa
2	Teitl y Papur Arholiad		
3	Cod y Mowl		
4	Dyddiad ac Amser yr Arholiad		
5	Lleoliad yr Arholiad		
6	Rhif Sedd		
7	Nifer y Llyfrau Atebion a gyflwynwyd	Cyfanswm	

A wnewch chi lenwi'r rhan hon a'i SELIO cyn i'r arholiad ddechrau.

Cyfenw _____ (LLYTHRENNAU BREISION) Enw(au) cyntaf _____

Q1

i)

a) $27 - 16 = 11 - 8 = 3 - 2 = 1 - 1 = 0$

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

b) $115 - 64 = 51 - 32 = 19 - 16 = 3 - 2 = 1$

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

ii)

a) $10011111 = 159$

b) $00160111 = 39$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 159 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 128 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 39 \end{array}$$

iii) a) 10111010 b) 11000011

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 10111010 \end{array}$$

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 11000011 \end{array}$$

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 10111010 \end{array}$$

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 11000011 \end{array}$$

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 10111010 \end{array}$$

$$\begin{array}{r} 128 \\ 64 \\ 32 \\ 16 \\ 8 \\ 4 \\ 2 \\ 1 \\ \hline 11000011 \end{array}$$

0

1

2

3

4

5

6

7

8

9

A = 10

B = 11

C = 12

D = 13

E = 14

F = 15

iv)

a) $3B = 59$

$3 = 8/4/2/1$
 $0 \ 0 \ 1 \ 1$

$B = 11$
 $1 \ 0 \ 1 \ 1$

128	64	32	16	8	4	2	1
0	0	1	1	1	0	1	1

32
16
8
2
1
59

b) $F6 = 2246$

$F = 15$
 $8/4/2/1$
 $1 \ 1 \ 1 \ 1$
 $0 \ 1 \ 1 \ 1 \ 0$

128	64	32	16	8	4	2	1
1	1	1	1	0	1	1	0

128
64
32
16
4
2
246

33 different unique values.

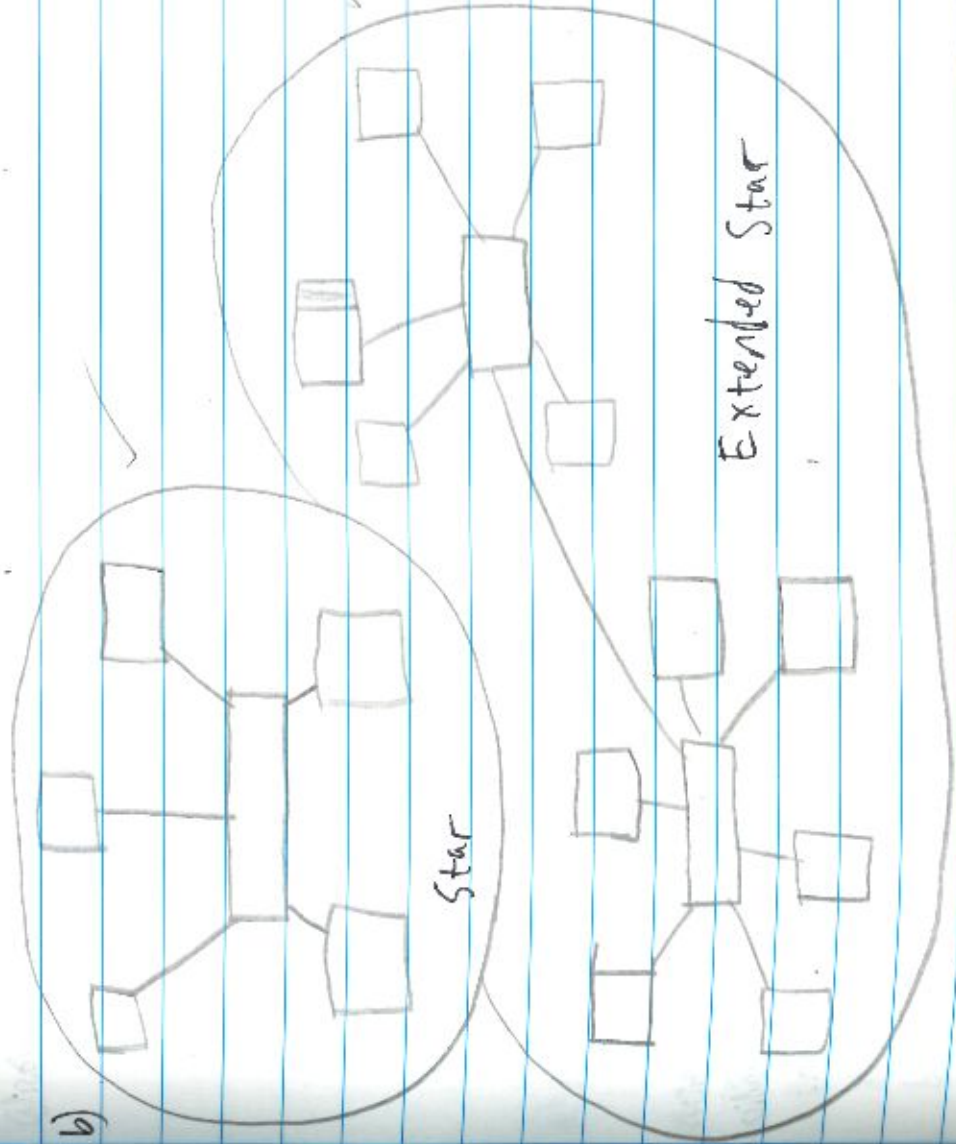
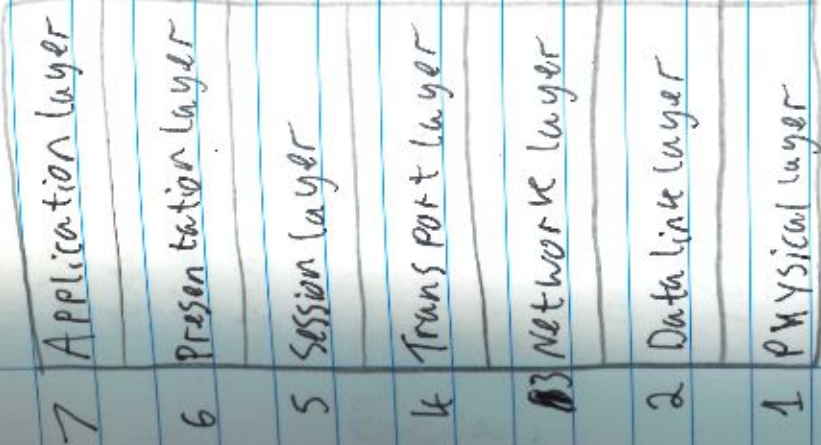
it would occupy 620000 bits

$600 \times 400 = 240000$
 $240000 \times 3 = 720000$
 $6 \times 4 = 24$

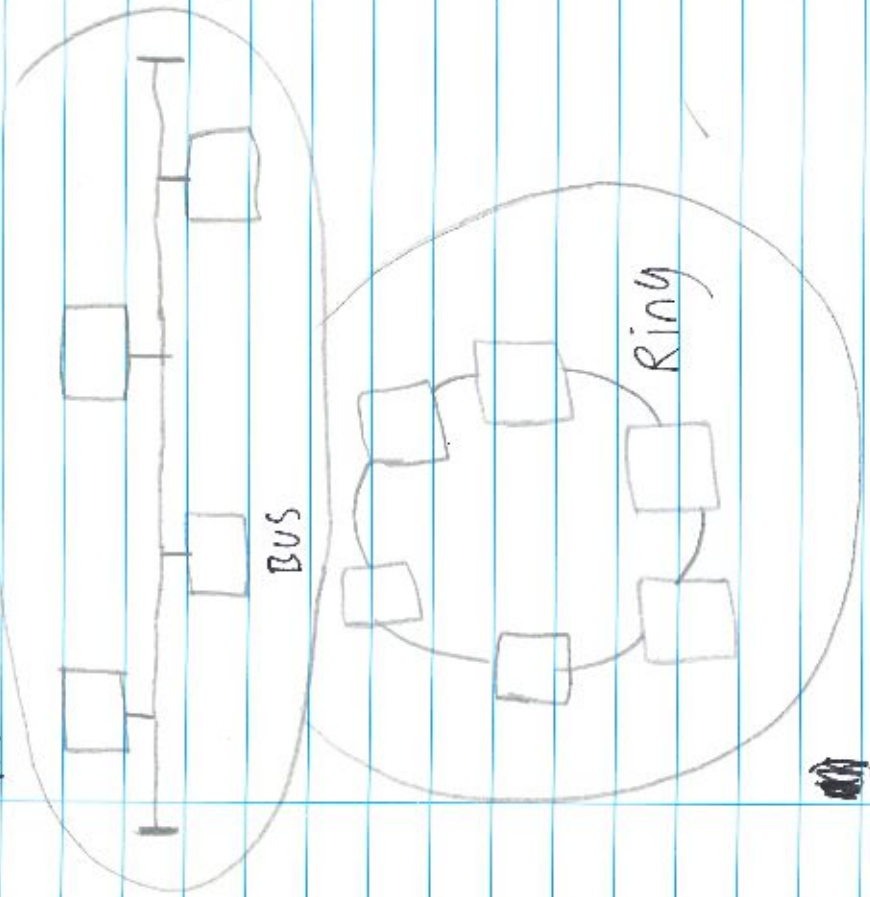
Viii) The size of the file size would decrease as compression method were taken place. An APPX image would be 31 KB
 $62 \div 2 = 31$

Q2

a) 7 layer model ISO/OSI 7 layer model.



iii)



C) Segments are found on the Transport layer of the ISO/OSI 7 layer model. This is layer 4.

Packets are found on the Network layer of the ISO/OSI 7 layer model. This is layer 3.

Frames are found on the Data Link layer of the ISO/OSI 7 layer model. This is layer 2.

D) Simplex is a transmission that can only travel in one direction. An example of this is radio stations. The radio station broadcasts to the radio, but no transmission can be sent from the radio to the radio station. So, ^{data} can only travel in one direction.

Half-duplex is data that can travel in both directions, except not at the same time. An example of this would be a walkie-talkie.

Full duplex is data that can travel in both directions, similar to a half-duplex, except that data can travel at the same time. An example of this would be a VoIP call, such as Skype, where both people can talk, send data, at the same time.

03.

A typical specification for a high-end Graphic Design PC would require a CPU that can handle processing graphical assets, a GPU that could render high resolutions, depending on the type of graphical design, storage to store the created content, and ports and features that need hardware, a decent amount of RAM to run the graphic creating software.

a) A suitable CPU would be the Intel i7 6700.

The reason I chose this CPU over i5 is because an i7 can handle processing data better than an i5. An i5 can run PC games well but I think an i7 would be not in need of gaming performance much over an i5. So, the i7 would be perfect for processing the graphical assets over an i5, purely based on the power advantage the i7 has for processing things like graphic design.

b) For graphical design, programs generally require 16GB of RAM. So here I would recommend 32GB of RAM.

The reason I chose more than recommended is because this is a high-end graphic design PC. 32GB would be beneficial if the user is going to use multiple of those graphical design software at once, which for a high-end PC build, it is going to be very likely. The 32GB would make for a smoother overall PC performance on using those demanding apps.

c) As Speed is going to be needed for this machine it would be beneficial to have

31b 7200RPM HDD

This HDD is going to allow the user of this machine to save high quality assets, that they created, without having to worry on running out of storage space. The 7200RPM is good for when the user wants to open a project quickly as the 7.2k drive would be faster to open save files over a 5.4k drive. An SSD would not be worth getting for ~~storing data~~ as they are too expensive for little ^{Storage}.

12066 SS

This is to install the operating system onto the faster boot, also to install and software needed for graphical design. It would be a faster system to use over just using a slower HDD.

d) The inputs would need to include ~~memory~~ 2 USB 3.0
4 USB 2.0

This would make for enough ports to plug in a graphics tablet, mouse and keyboard with enough room to plug in any extra external storage too.

7.4
The output must include a DMI port so to connect the monitor to the pc. This is so the port supports the content.

o) ~~ATI~~ Nvidia GTX 1060 3GB VRAM

I have chosen this card as it has an HDMI connection for the 1080p monitor and a display port to support 4k at 120Hz.

~~present~~ It could require enough VRAM to render graphical content, 3D or 2D.

I chose this card over the 1050 purely because it had more VRAM and the 1050 doesn't support 4k output. This is card is built specifically for 4k content, so it is perfect for a graphical design PC.

Q4.

Full: is a type of backup method which means for a backup on every day of the week

[illegible]

Incremental: if when you ~~load~~ full back up once or twice a week and update the images every other day

mon	Tue	wed	Thu	Fri	SAT	SUN
						

Full all changes all changes all changes Full changes

differential: is when you back up changes of each day as a new drive, since the last full backup.

Full Mon	change	change	change	change	change	change
Tue	change	change	change	change	change	change
Wed.	change	change	change	change	change	change
Thu	change	change	change	change	change	change
Fri	change	change	change	change	change	change
Sat	change	change	change	change	change	change
Sun	change	change	change	change	change	change

✓
The advantage is that USB's can easily be corrupted and lost/stolen. Making all your work/backup one in a million.

- b) ✓
- i) the advantages of this is that it is cheap to buy.
 - ii) the advantage of this is that it comes in many different storage sizes and are easily backed up.
 - the disadvantage is that you will need a lot of optical drives or person will need correct labeling.



- iii) ✓
- The advantages here is that it can be carried around and can hold a great amount of storage.
- The disadvantage is that the HDD could easily become corrupt making the drive and data unusable.
- Another advantage is that it is generally fast to back up data with fast transfer speeds.

iv) SAN = Storage Area Network.

✓

The advantage of this is that the entire system consists of only HDD, so there can be anything from 500 Tb to more than a petabyte of storage.

✓

The disadvantage is that if the network crashes all data will not be accessible. Another is that it can be easily stolen.

US criminals would know that all data is going to be stored here.

✓

v) An advantage here is that a USB can be carried around on your car keys and you can own many of them with storage going up to 512 Gb. The transfer speed is also quick, making for a speedy backup.