

(see note 2 below)

FORENAME(S): MATTHEW
LEWIS

12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) 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		List the numbers of the questions you have attempted	Office Use
2	Title of Examination Paper	COMPUTER ARCHITECTURE AND NETWORKING	1 2 3 4 6	10 10 13 13 11 11 16 16 9 9
3	Module Code	D4X00002		
4	Date and Time of Examination	30.04.18 9:30		
5	Examination Venue	TYCOCH COLLEGE MAIN HALL		
6	Seat Number	3		
7	Number of Answer Books handed in	1		
			Office Use	59 59

(Gweler yr ochr arall am y fersiwn Cymraeg)



Prifysgol Cymru
Y Prifddod Dewi Sant
University of Wales
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12 Tudalen

ENW(AU) CYNTAF:

Llenwch, plygwch a seliwch

(gwelet nodyn 2 isod)

1. Rhowch yr holl wybodaeth y gofynnir amdani yn y blychau isod.

2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, pligwch

ef a' i selio i lawr (gan ddefnyddio'r label a ddarparwyd) i

guddio'ch enw.

3. Rhaid i'r atebion fod mewn llawysgrifen ddarllenadwy. Gall

4. Ysgriennwch eich atebion mewn inc.

5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu i'nnell drydddyn.

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 gwylwlwr/gwylwyr.

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.

[illegible]

(See the other side for English version)

1a)

RAID 0 is striping, the linking of 2 hard disks to utilize both of the disks speed and capacity. RAID 0 has no fault tolerance as if one drive fails the whole array will.

It is however the fastest option.

RAID 1 is mirroring, A separate disk is used to mirror the data to allow it to recover the data if the hard disk fails.

RAID 1 has a very high fault tolerance but is more expensive due to the extra drive without capacity and speed gain.

RAID 0+1 is striping with mirroring, utilizing both the speed and capacity upgrade of striping but the fault tolerance of mirroring. RAID 5 is using at least 3 hard disks and sharing 1 disk's worth of recovery data across all 3 drives. In the event of a failure no data will be lost while still being able to access and use ~~all 3 drives~~ 2 drives.

RAID 5 with 3 2TB drives should be used for this scenario as it has the necessary redundancy to protect the companies data but with the speed and capacity of 3 drives.

b)

Preventative maintenance has a key role in maintaining hard disk health by performing regular disk cleansups you remove unused and unwanted data. Defragmentation allows the drive to store files in a contiguous fashion preventing possible slowdown and hard disk failure. Utilizing S.M.A.R.T monitors the hard disk. Disk Error checking checks the hard disk for unfinished tasks and corrupted files allowing for removal.

Examiner Only		Question No.	Examiner Only		Question No.
	3a) The address bus generates a memory location address from the CPU chipset.	3a)		The user should first check their motherboard manual to reassure them that the board can support 32GB RAM, it shows the board only supporting 32GB. Only 3-5GB is being used due to a 32-bit OS being installed, this limits the amount of RAM available to 4GB including virtual memory. The CPU is only 64-bit (core and processor), upgrading the core count and speed would increase performance. Upgrading the motherboard to one that supports 32GB of RAM in 4 DIMM lanes and installing a 64-bit operating system to use that memory is the best course of action.	2a)
	The control bus is a bi-directional bus which sets/monitors signals in the system.	1		A restart interrupt is used when the OS triggers a restart, a program error interrupt is sent when a program crashes or is no longer responding in order for it to be ended. A hardware error interrupt occurs when a disk fails or memory fails, usually resulting in a blue screen error report. A timer interrupt is called using the interval clock usually found on the CPU.	b)
	The data bus transfers data between elements in the system.			The process manager allows the user to manage active processes, stop programs or destructive processes and prevents any one process from locking out the operating system. It can also set process priority for use with interrupts and process affinity. The process manager is useful for control and security.	c)
	USB is the most widely known and used interface. Many devices are compatible with versions of USB. It can support up to 127 devices, it is hot swappable allowing you to just plug in and go. Many USB devices are portable. USB is limited by speed, its data transfer rate is usually lower than SATA. USB can be used to transfer data and receive electrical charge simultaneously.	c)			
	The data bus is bi-directional because it sends and receives data.				
	The control bus is bi-directional because it sends and receives signals when monitoring.	b)			
Rhif y Cwestiwn		Arholwr yn unig	Rhif y Cwestiwn		Arholwr yn unig

4.91) 30

i) 192.168.74.0 - 192.168.74.31

192.168.74.32 - 192.168.74.63

192.168.74.64 - 192.168.74.95

192.168.74.96 - 192.168.74.127

192.168.74.128 - 192.168.74.159

192.168.74.160 - 192.168.74.191

192.168.74.192 - 192.168.74.223

192.168.74.224 - 192.168.74.255

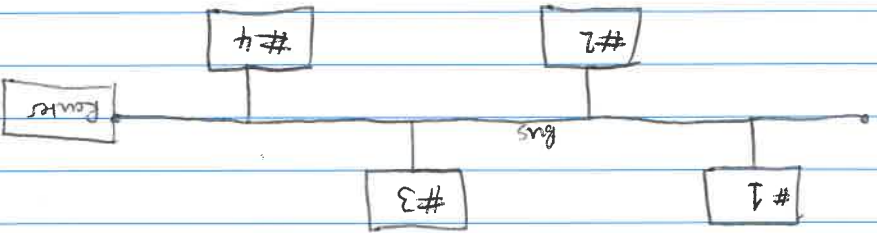
iii) The gateway address is the IP address of the router allowing the computer to connect the router will allow it to connect to the internet.

5) DHCP is a protocol specifically designed to minimize error by automatically assigning IP addresses to new devices. It also

renewes old and unused IP addresses after a period of time selected by the user. DHCP also assigns the default gateway and subnet mask automatically. DHCP avoids IP conflicts.

* Dynamic Host Configuration Protocol

6/6



Advantages of the Bus topology are that it's easy to set up and requires the least amount of cabling and no switch. Can support up to 10 hosts before performance loss.

Disadvantages of the Bus topology are that it is difficult to find faults on the network. When a host fails the whole network fails. No use of CSMA/CD so when packets collide an error is returned and all actions are suspended. Security is compromised due to the packets being received at each host along the bus.

	Source Address	Destination Address	Type of packet	data	Checksum
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The source address and destination address show where the packet is being sent from and to. The type of packet determines what data type is being sent. The data is the data inside the packet. The contents. The checksum is used to check to see if the packet was received or if there was an error.

c) The session layer is what connects the application and presentation layers. It checks for incompatibilities between the programs and the OS. The transport layer is where the type of data and amount of data is determined, then it is sent and received.