

Llenwch, plygwrch a seliwrch
(gweler nodyn 2 isod)

CYFENW:

ENW(AU) CYNTAF:

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

2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, plygwrch ef a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.

3. Rhaid i'r atebion fod mewn llawysgrif dda llenadwy. Gall yr Arholwyr naill ai anwybyddu sgrïpt annarllenadwy, 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 fras nodiadau yn y llyfr atebion a thynnu 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 gwyllwr/gwyllwyr.

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.

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

1	Rhif Myfyriwr	
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	

(See the other side for English version)



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Examination Answer Books

12 Pages

Instructions to Candidates

- Please give the information requested in the boxes below.
- Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
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1	Student Number	1700481
2	Title of Examination Paper	Computer Architecture and Networks
3	Module Code	ACCA4001
4	Date and Time of Examination	10/05/2018 3PM
5	Examination Venue	MB103
6	Seat Number	
7	Number of Answer Books handed in	2

(Gweler yr ochr arall am y fersiwn Cymraeg)

Complete, fold and seal
(see note 2 below)

SURNAME: HOOPER

FORENAME(S): AUSTIN

1a. a) 56

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

$$\begin{array}{r} 56 \\ 32 \\ \hline 24 \end{array}$$

~~32~~ 32 fits in with 24 remainder
 $24 - 16 = 8$.

$$56 = \underline{00111000}$$

b) 163

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

$$\begin{array}{r} 163 \\ 128 - \\ \hline 035 \\ 032 - \\ \hline 003 \end{array}$$

128 fits 35 remainder
 32 fits 3 remainder
 3 left is 2+1.

$$163 = \underline{10100011}$$

1b. ~~1b~~

$$\textcircled{a} 11100110 \rightarrow \begin{array}{cccccccc} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 0 & 0 & 1 & 1 & 0 \end{array}$$

$$\begin{array}{r} 128 \\ 64 + \\ 32 + \\ 04 + \\ 02 \\ \hline 230 \\ 12 \end{array}$$

$$11100110 = \underline{230} \quad \checkmark$$

3

$$\textcircled{b} 01010011 \rightarrow \begin{array}{cccccccc} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 0 & 1 & 0 & 1 & 0 & 0 & 1 & 1 \end{array}$$

$$\begin{array}{r} 64 \\ 16 + \\ 2 + \\ 1 + \\ \hline 83 \\ 1 \end{array}$$

$$01010011 = \underline{83} \quad \checkmark$$

3

1c.

$$\textcircled{a} 8B \quad \begin{array}{l} 8 \text{ in decimal} = 8 \\ B \text{ in decimal} = 11 \end{array}$$

$$8 = 1000 \quad B = 1011$$

$$8B = \underline{10001011} \quad \checkmark$$

2

~~1b~~

$$\textcircled{b} A7 \quad \begin{array}{l} A \text{ in decimal} = 10 \\ 7 \text{ in decimal} = 7 \end{array}$$

$$10 = 1010 \quad 7 = 0111$$

$$A7 = \underline{10100111} \quad \checkmark$$

2

1d.

a) 23

2 in decimal = 2
3 in decimal = 3

2 = 0010

3 = 0011

binary equivalent = 00100011

decimal = $32 + 2 + 1$ 23 in hex = ~~1B~~ 17 in decimalb) EF E in decimal = 14
F in decimal = 15

14 = 1110

15 = 1111

binary equivalent = 11101111

decimal =

128	
064	+
032	+
008	+
004	+
002	+
001	+
239	
12	

EF in hex = 239 in decimal.

1e.

24 values

= 16 values.

2 ⁰	=	1
2 ¹	=	2
2 ²	=	4
2 ³	=	8
2 ⁴	=	16

1f.

200 x 800 image

total pixels = 200×800

= 160,000 pixels.

16 million colours, so RGB 8-bit per colour.

160,000 px X 3 bytes

= 480,000 bytes.

÷ 1,000 to approximate KB

= 480 KB

1g. 12 point text, A4.
 Assume 10 words per line.
 One space after each word.
 Assume 40 lines.
 $40 \text{ lines} \times 10 \text{ words} = 400 \text{ words}$

Standard ASCII uses 7 bit per char, stored as 1 byte.

Assume Average word has 5 characters

5 chars + 1 space = 6 chars/word

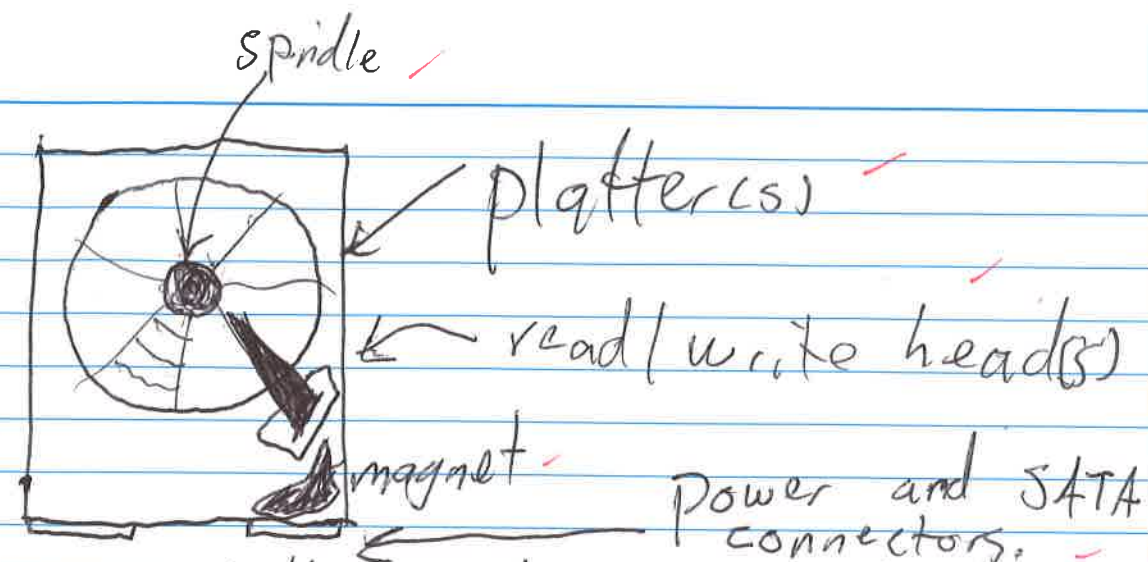
6 char x 400 words = 2,400 characters..

2,400 char x 1 byte = 2,400 byte

$\div 1,000$ to approximate KB

= 2.4 KB

2a.



The platter rotates at high RPM (7,200 is common) while the r/w head moves above it.

By rotating both, any part of the platter can be accessed and magnetised or read from.

Average access time, measured in ms, is the amount of time for the arm to position itself above the desired spot on the platter, and read data.

Sustained transfer speed refers to a speed in megabytes per second which the drive can sustain when saving large files, continuously.

Burst transfer speed refers to the speed the drive can save * smaller files. This will be faster than sustained speed as small files can be stored in cache which is faster.

* Save or access

2b.

An SSD differs from a HDD in that it uses Flash chips to store data, as opposed to on platters.

As a result, SSDs have no moving parts as there is no platter or arm.

An SSD can be likened to a higher-capacity, faster, and more durable USB Flash drive.

Advantages:

- SSD read and write speeds are far higher than HDDs.
- Since SSDs have no moving parts, they are less prone to physical damage. Lack of moving parts also means they produce less heat.

Disadvantage:

- SSDs only have a set amount of reads/writes that can be performed before the drive dies, whereas HDDs do not.

3.

No. Answer

3.

1 - ease of setup.

2 - Frame

3 - Crossover twisted-pair

4 - 128

5 - 200, 165, 200, 215

6 - data

7 - Communication

8 - Selecting the path to destination networks.

9 - Spyware

10 - Lan devices

11 - Physical network topology

12 - bandwidth; throughput.

13 - Brute force

14 - TCP

15 - NFC

16 - 10.1.1.1

✓ /

17 - SSH

✓ /

18 - SMTP

19 - default gateway

✓ /

20 - DoS

✓ /

21 - UDP

✓ /

22 - encapsulation

✓ /

23 - multicast

✓ /

24 - ff:ff:ff:ff:ff:ff

✓ /

25 - Network Interface Card (NIC)

✓ /

26 - Reference model

✓ /

27 - HTTP server

✓ /

28 - Internet

✓ /

29 - email

✓ /

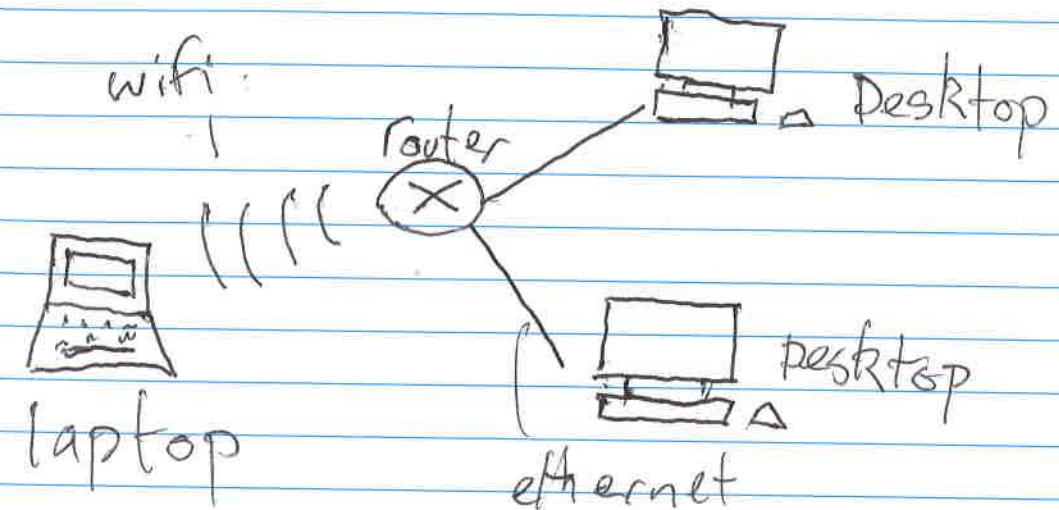
30 - 255.255.255.255

✓ /

28

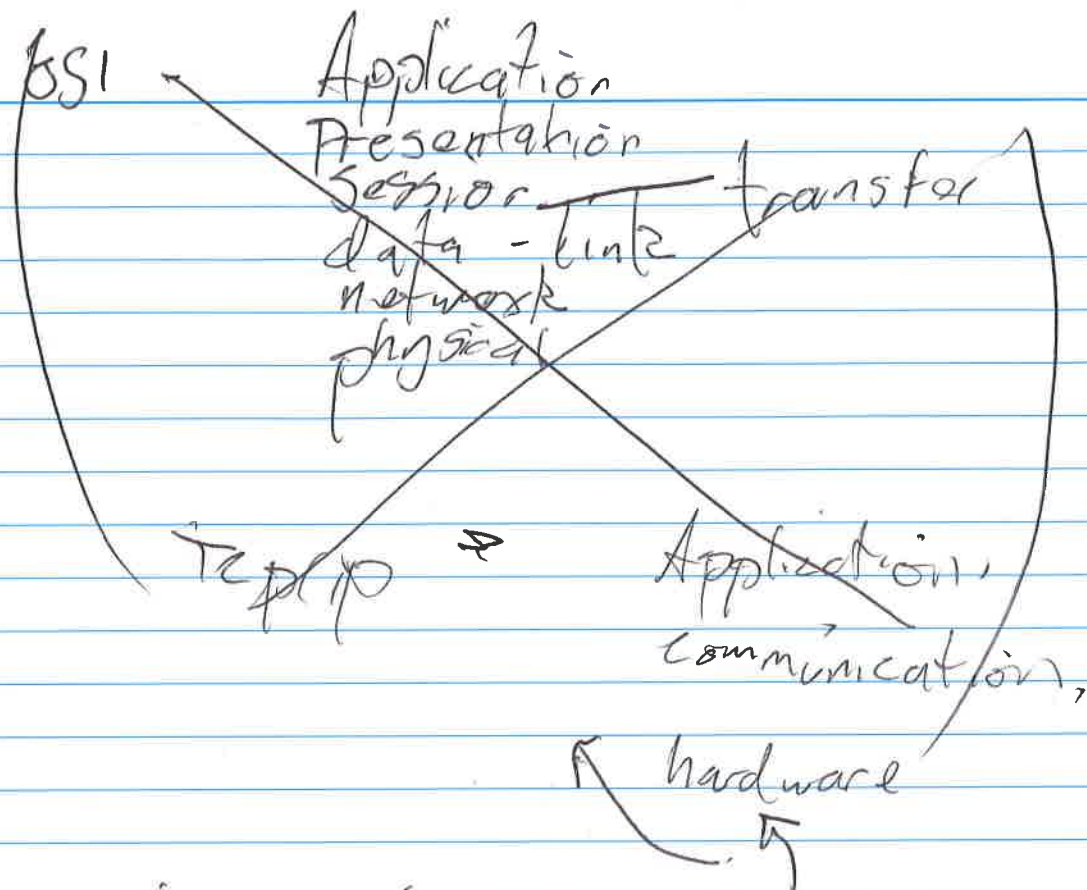
4a.

A computer network is two or more computers connected together to communicate. See home network diagram below:



4 /

A switch could be used but as I chose to illustrate a home network, a router is more appropriate.



please ignore this.
Continued in new booklet.

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5	Lleoliad yr Arholiad		
4	Dyddiad ac Amser yr Arholiad		
3	Cod y Modwl		
2	Teitl y Papur Arholiad		
1	Rhif Myfyrwr		

Rhestrwch rifau'r cwestiynau a ymgaisiwyd gennych	At Dibenion y Swyddfa
---	-----------------------

- Ni ddylid rhwgo 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 gwylwyr/gwylwyr.
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- Ysgrifennwch eich atebion mewn inc.
- Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddynt.

Cyfarwyddiadau i Ymgaiswyr

12 Tudalen

Llyfr Atebion Arholiadau

Llenwch, plygch a seliwch
(gweler nodyn 2 isod)

CYFENW:

ENW(AU) CYNTAF:

4b.

OSI reference model:

Application
 presentation
 session
 transport
 data-link
 network
 physical

✓
 ✓
 ✓
 ✓
 ✓
 ✓

6½

OK

4c. ~~Device~~ device layer - PCs, and devices

media layer - cables, wifi etc.

network layer - routers, switches, etc.

4d.

i. $192 \cdot 168 \cdot 26 \cdot 38$

$$192 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \end{matrix}$$

$$168 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \end{matrix}$$

$$26 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 \end{matrix}$$

$$38 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 0 & 0 & 1 & 0 & 0 & 1 & 1 & 0 \end{matrix}$$

So $192 \cdot 168 \cdot 26 \cdot 38 =$

$$11000000 \cdot 10101000 \cdot 00011010 \cdot 00100110$$

$172 \cdot 200 \cdot 78 \cdot 254$

$$ii. 172 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 0 & 1 & 0 & 1 & 0 & 1 & 0 \end{matrix}$$

$$200 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \end{matrix}$$

$$78 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 \end{matrix}$$

$$254 = \begin{matrix} 128 & 64 & 32 & 16 & 8 & 4 & 2 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 \end{matrix}$$

So $172 \cdot 200 \cdot 78 \cdot 254 =$

$$10101010 \cdot 11001000 \cdot 01001110 \cdot 11111110$$

iii. $255 \cdot 255 \cdot 255 \cdot 240$

$$255 = 11111111$$

$$240 = 11110000$$

So $255 \cdot 255 \cdot 255 \cdot 240 =$

$$11111111 \cdot 11111111 \cdot 11111111 \cdot 11110000$$

[illegible]

[illegible]