



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	2238365
2	Title of Examination Paper	Computer Architecture
3	Module Code	4022
4	Date and Time of Examination	22.11.2023
5	Examination Venue	GP
6	Seat Number	E4
7	Number of Answer Books handed in	

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)



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

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

1. Rhwch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, plynwch et a'i seilio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.

3. Rhaid i'r atebion fod mewn llawysgriften ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu dsgrif annarllennadwy, neu drefnu lddi! 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 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 gwyllwyr/gwylwyr.
8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliaeth o dan unrhyw amgylchriad.

7	Nifer y Llyfrau Atebion a gyflwynwyd	
6	Rhif Sedd	
5	Lleoliad yr Arholiad	
4	Dyddiad ac Amser yr Archoliad	
3	Cod y Modwl	
2	Teitl y Papur Arholiad	
1	Rhif Myfyriwr	

(See the other side for English version)

[illegible]

Llenwch, plygwch a seliwch
(gweler nodyn 2 isod)

CYFENW:

ENW(AU) CYNTAF:

QUESTION ONE:

i. a. $(769)_{10}$ to $(?)_2$

2	769	REMAINDER
2	384	1
2	192	0
2	96	4
2	48	0
2	24	0
2	12	0
2	6	0
2	3	0
2	1	1

 $(1200000401)_2$ ii. b. $(9A2)_{16}$ to $(?)_2$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ 1001 & 1010 & 0010 \end{array}$$
 $(100110100010)_2$ ii. a. $(87)_{10}$ to $(?)_8$

8	87	R
8	10	7
8	1	2

 $(127)_8$ ii. b. $(5D9)_{16}$ to $(?)_8$

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ 0101 & 1101 & 1001 \end{array}$$
 $(010111011001)_2 \rightarrow (2731)_8$ iii. a. $(1110101001)_2 \rightarrow (?)_{10}$

$$1 \times 2^9 + 1 \times 2^8 + 1 \times 2^7 + 0 \times 2^6 + 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

$$1 \times 512 + 1 \times 256 + 0 + 1 \times 32 + 0 + 1 \times 8 + 0 + 0 + 1 = 809$$

$$512 + 256 + 32 + 8 + 1 = 809$$

 $(809)_{10}$

$$\text{iii b } (50E)_{16} \rightarrow (?)_{10}$$

$$\begin{array}{ccc} & 2 & 1 & 0 \\ & \downarrow & \downarrow & \downarrow \\ & 5 & 0 & 14 \end{array}$$

$$5 \times 16^2 + 0 \times 16^1 + 14 \times 16^0$$

$$5 \times 256 + 0 + 14 \times 1$$

$$1280 + 0 + 14 = 1294$$

$$(1294)_{10}$$

$$\text{iv a } (4278)_{10} \text{ to } (?)_{16}$$

16	4278	R
16	267	6
16	15	11
16	1	0

$$(10B6)_{16}$$

$$\text{iv b } (670)_{10} \text{ to } (?)_{16}$$

16	670	R
16	41	14
16	3	9

$$(3914)_{16}$$

QUESTION TWO

(a) CPU

(b) MEMORY

(c) INPUT DEVICE

(d) OUTPUT DEVICE

(e) STORAGE DEVICE

(f) COMMUNICATION DEVICE

1 RAM

2 RAM

2 ETHERNET PORT

5 Gamepad

4 Flash Drive

3 Microphone

QUESTION THREE

TIME REQ 5000 BY DUAL CORE CPU

FREQUENCY 2.5 GHz

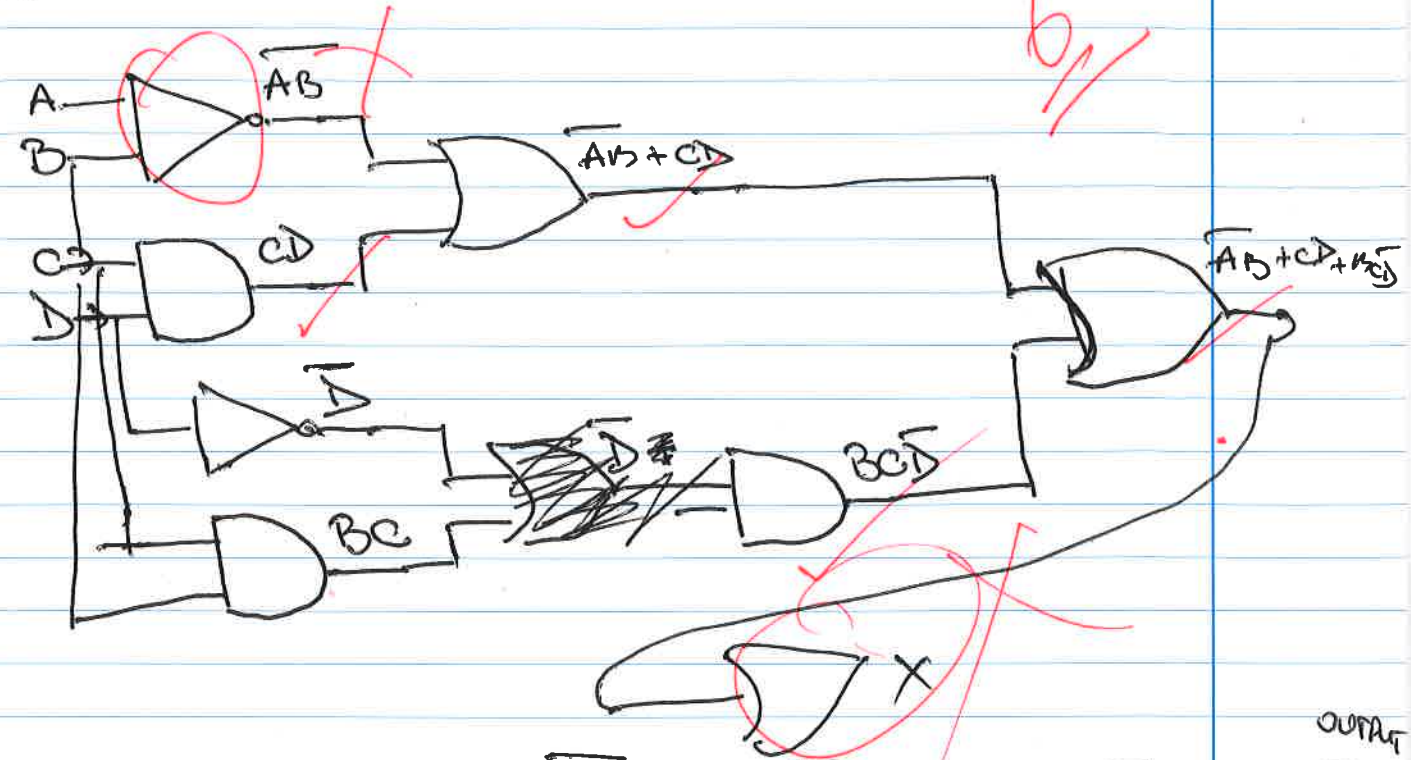
$$5000 \div 2 = 2500$$

TIME REQ IS 00/100,

$$G = 10^9$$

2.5 GHz

QUESTION FOUR $X = \overline{AB} + CD + BC\overline{D}$

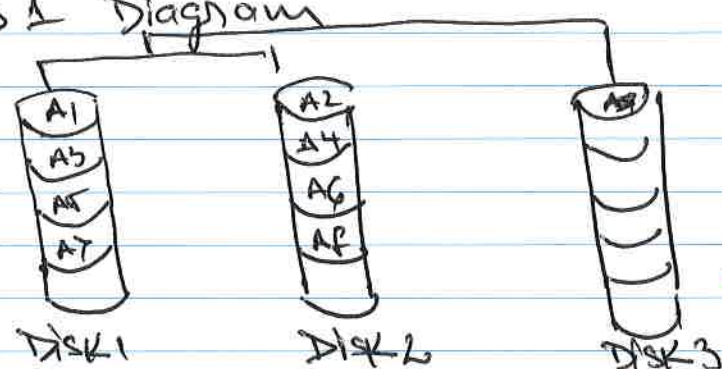


INPUT	A	B	C	D	$\overline{AB}$	$\overline{BCD}$	$\overline{AB} + CD$	$\overline{AB} + CD + \overline{BCD}$	OUTPUT
0000	0	0	0	0	1	1	1	1	1
0001	0	0	0	1	1	1	1	1	1
0010	0	0	1	0	1	1	1	1	1
0011	0	0	1	1	1	1	1	1	1
0100	0	1	0	0	1	1	1	1	1
0101	0	1	0	1	1	1	1	1	1
0110	0	1	1	0	1	1	1	1	1
0111	0	1	1	1	1	1	1	1	1
1000	1	0	0	0	0	1	1	1	1
1001	1	0	0	1	0	1	1	1	1
1010	1	0	1	0	0	1	1	1	1
1011	1	0	1	1	0	1	1	1	1
1100	1	1	0	0	0	1	1	1	1
1101	1	1	0	1	0	1	1	1	1
1110	1	1	1	0	0	1	1	1	1
1111	1	1	1	1	0	1	1	1	1

QUESTION 1 FIVE

- a) RAID is a Redundant Array of Industrial Disks
 2 Characteristics - recovery data lose
 2 benefits - they can store lots of data.
 - able to backup.
 - able to transfer information to each other.

b) RAID 1 Diagram



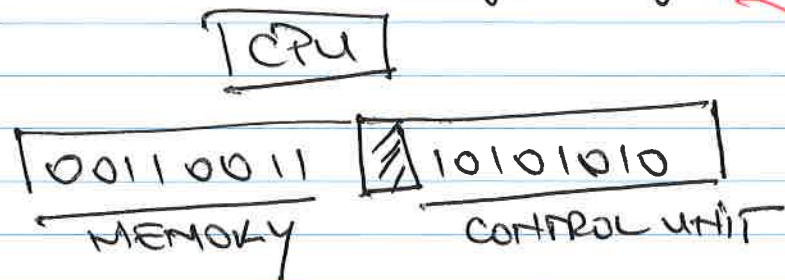
no less capacity

- c) RAID 1 If RAID 1 lose data everything can go on RAID 0 and data has a backup.

QUESTION 6

- a) CPU - is Control Processing Unit and is called, brain of the computer.

Fetch - is executing binary operations

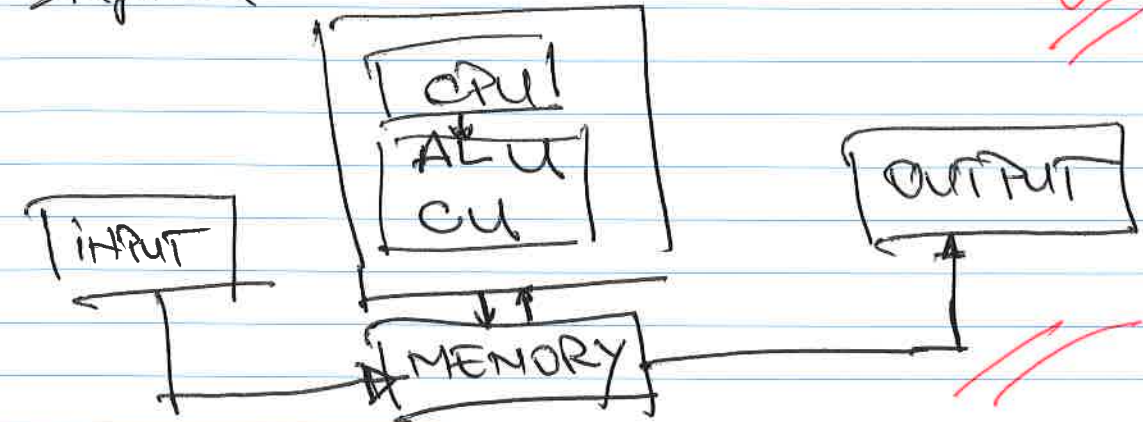


- b) Control Processing Unit is sending information to memory and from there is executing binary operations.

2

QUESTION SEVEN

a) Diagram



b) Advantages - based on V/N concept processing
 - ~~can execute 1 clock cycle~~
 - used on workstation, laptops

c) Disadvantages - can execute only 1 clock cycle
 - data and instruction are going to memory on 1 way.

Question No.

Examiner Only

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Examiner Only

Arholwr yn unig

Arholwr yn unig Rhif y Cwestiwn

Rhif y Cwestiwn