

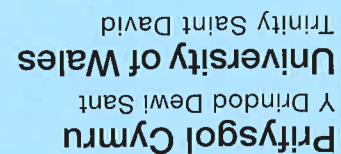


12 Pages

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.**

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)



12 Tudalen

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 ef a'i seilio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.

1. Rhaid i'r atebion fod mewn llawysgriften ddarllenadwy. Gall yr Arholwyr naill ai anwybyddu sgript annarllenadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
2. Ysgrifennwch eich atebion mewn inc.
3. Ni ddylid rhwygo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.
4. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyllwyr/gwylwyr.
5. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholio o dan unrhyw amgylchadad.

[illegible]

(See the other side for English version)

ENW(AU) CYNTAF:

Llenwch, plygwrch a seilwch
(gweler nodyn 2 isod)

QUESTION ONE

i-

a $(769)_{10} = (x)_2$

$$\begin{array}{r|l}
 769 \div 2 & 384 \text{ R } 1 \\
 384 \div 2 & 192 \text{ R } 0 \\
 192 \div 2 & 96 \text{ R } 0 \\
 96 \div 2 & 48 \text{ R } 0 \\
 48 \div 2 & 24 \text{ R } 0 \\
 24 \div 2 & 12 \text{ R } 0 \\
 12 \div 2 & 6 \text{ R } 0 \\
 6 \div 2 & 3 \text{ R } 0 \\
 3 \div 2 & 1 \text{ R } 1 \\
 1 \div 2 & 0 \text{ R } 1
 \end{array}$$

1100000001

Answer:

$(769)_{10} = (1100000001)_2$

b ~~9A2~~ $(9A2)_{16} = (x)_2$

100110100010

Answer:

$(9A2)_{16} = (100110100010)_2$

II.-

a $(87)_{10} = (x)_8$

$$\begin{array}{r|l}
 87 \div 8 & 10 \text{ R } 7 \\
 10 \div 8 & 1 \text{ R } 2 \\
 1 \div 8 & 0 \text{ R } 1
 \end{array}$$

127

Answer

$(87)_{10} = (127)_8$

b $(5D9)_{16} = (x)_8$

~~01011011001~~01011011001
2 7 3 1

Answer:

$(5D9)_{16} = (2731)_8$

III. -

$$a \quad (1110101001)_2 = (x)_{10}$$

$$2^9 + 2^8 + 2^7 + 2^5 + 2^3 + 1 = 512 + 256 + 128 + 32 + 8 + 1 = 937$$

Answer

$$(1110101001)_2 = (937)_{10}$$

$$b \quad (50E)_{16} = (x)_{10}$$

$$5 \times 16^2 + 14 = 5 \times 256 + 14 = 1280 + 14 = 1294$$

Answer:

$$(50E)_{16} = (1294)_{10}$$

IV. -

$$a \quad (4278)_{10} = (x)_{16}$$

$$4278 \div 16 \quad 267R6$$

$$267 \div 16 \quad 16R11(B)$$

$$16 \div 16 \quad 1R0$$

$$1 \div 16 \quad 0R1$$

10B6

Answer

$$(4278)_{10} = (10B6)_{16}$$

$$b \quad (670)_8 = (x)_{16}$$

$$110111000_2$$

$$1 \quad B \quad 8$$

Answer

$$(670)_8 = (1B8)_{16}$$

QUESTION TWO

1. - RAM $\rightarrow$ (b) Memory ✓
2. - Ethernet Port $\rightarrow$ (g) Communication Device ✓
3. - Microphone $\rightarrow$ (c) Input device ✓
4. - Flash Drive $\rightarrow$ (e) Storage Device ✓
5. - Gamepad $\rightarrow$ (c) Input device ✓

QUESTION THREE

$$\frac{50000}{2 \times 2.5 \times 10^3} = \frac{50000}{5 \times 10^6} = 10 \times 10^{-6} \text{ s}$$

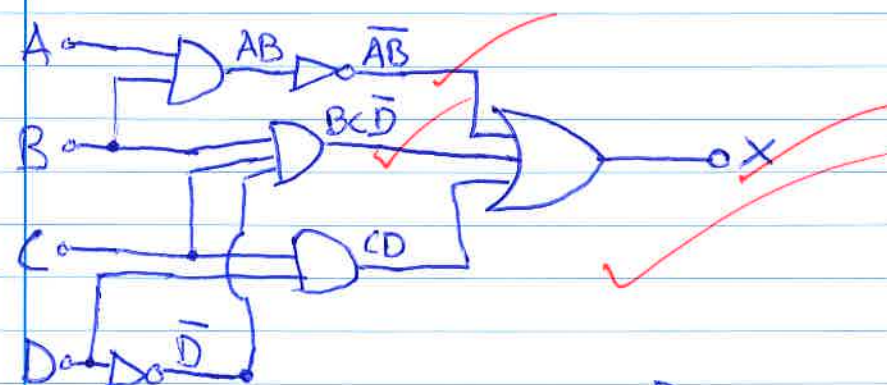
Answer

10 μ s (microseconds) ✓

QUESTION FOUR

AND			OR			NOT	
A	B	Y	A	B	Y	A	Y
0	0	0	0	0	0	0	1
0	1	0	0	1	1	1	0
1	0	0	1	0	1		
1	1	1	1	1	1		

$$X = \bar{A}\bar{B} + CD + B\bar{C}\bar{D}$$



Logical Expression

10

TRUTH TABLE

A	B	C	D	AB	$\overline{A}\overline{B}$	CD	$\overline{C}\overline{D}$	$B\overline{C}\overline{D}$	X
0	0	0	0	0	1	0	1	0	1
0	0	0	1	0	1	0	0	0	1
0	0	1	0	0	1	0	1	0	1
0	0	1	1	0	1	1	0	0	1
0	1	0	0	0	1	0	1	0	1
0	1	0	1	0	1	0	0	0	1
0	1	1	0	0	1	0	1	1	1
0	1	1	1	0	1	1	0	0	1
1	0	0	0	0	1	0	1	0	1
1	0	0	1	0	1	0	0	0	1
1	0	1	0	0	1	0	1	0	1
1	0	1	1	0	1	1	0	0	1
1	1	0	0	1	0	0	1	0	0
1	1	0	1	1	0	0	0	0	0
1	1	1	0	1	0	0	1	1	1
1	1	1	1	1	0	1	0	0	1

✓

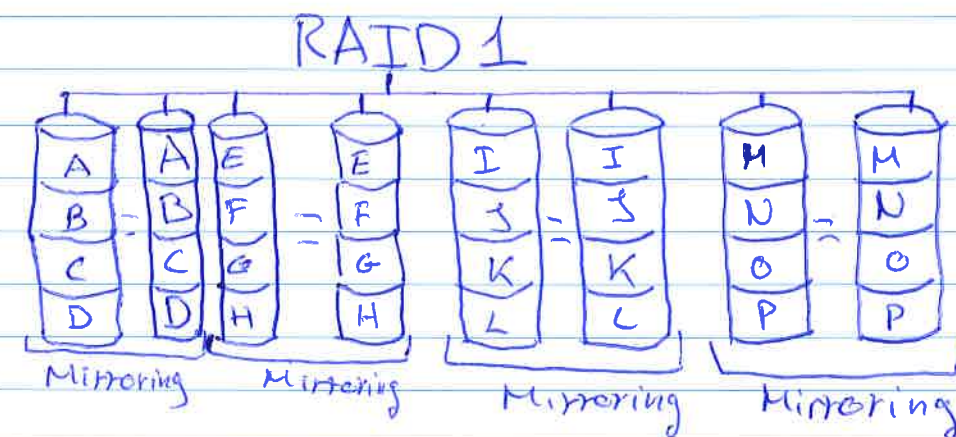
✓

QUESTION FIVE

- a - RAID is a system usually used by businesses
 - RAID has different Levels and each one has his advantages and disadvantages. Users/Businesses/companies must choose carefully which one suites better to the use they will give it, ~~the best~~ to increase the benefits and minimize the disadvantages, for example if a company needs a solution that its cheap and the stored data is not much relevant "RAID 0" can be a good option if not the best one for them.

b RAID 1: Also known as "MIRRORING"

RAID 1 makes a identical copy of a drive of each segment



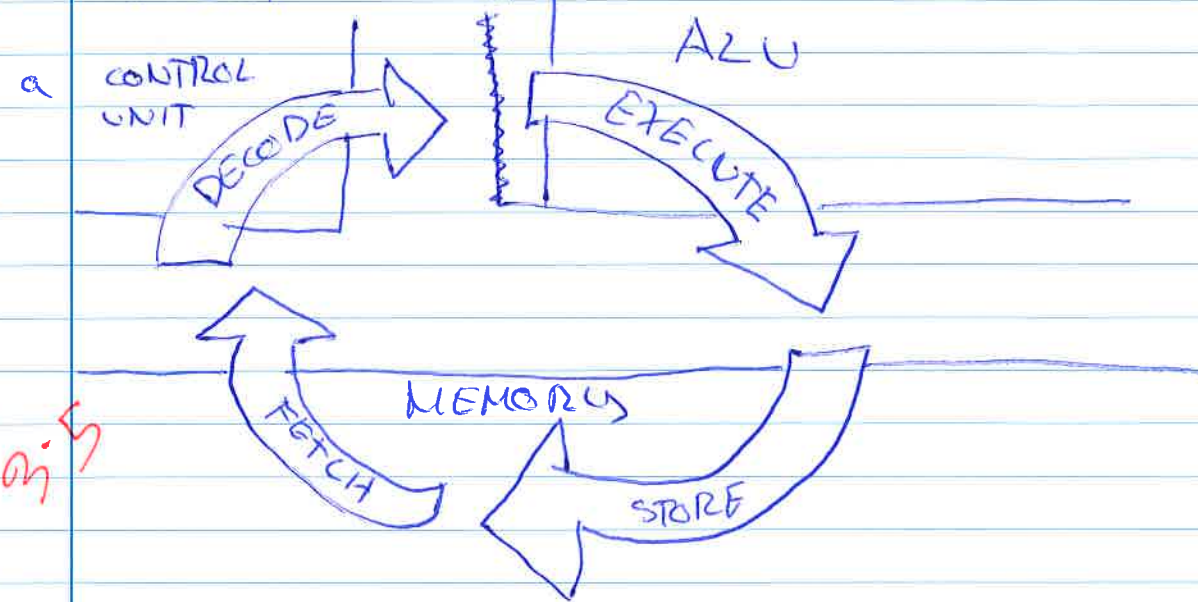
c Advantage:

Making an identical copy of each drive makes RAID 1 reliable because if one drive fails the data will still be accessible because it will be accesible from the mirrored drive

Disadvantage:

Using the RAID 1 system will increase the cost, RAID 1 will require at least one additional drive for ~~each~~ every drive to be able to make the backup mirroring that drive.

QUESTION SIX



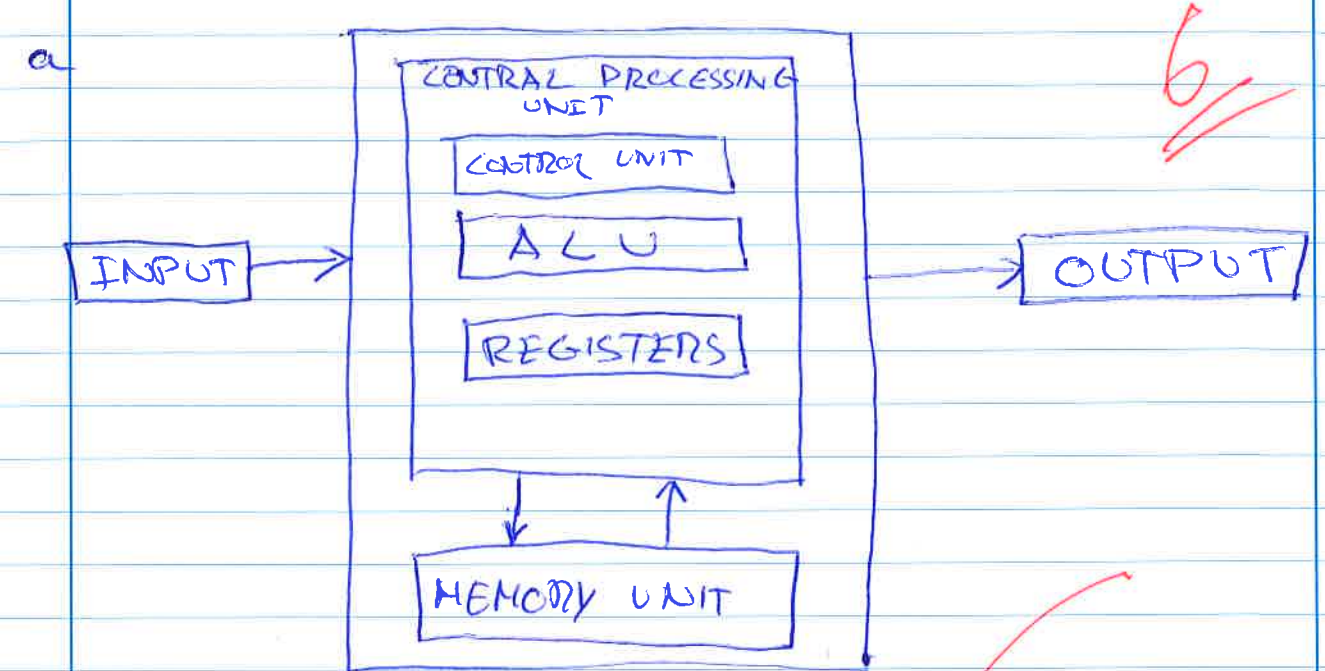
b Fetch: Get the instruction and update what to do.

Decode: Decode the instruction by using the operation code.

Execute: Connect the parts by doing the tasks.

Store: Get the result and write back if it is necessary.

QUESTION SEVEN:



b Advantages:

- Von Neumann Architecture uses the same memory unit for data and instructions, thank to this this architecture need less components this:

- Makes it cheaper (less components, less costs)
- Makes it simpler and because has a simpler ~~skeleton structure~~ architecture it is easier to develop for it.

c Disadvantages:

- Having a shared memory unit will provoke "bottleneck" when the use of memory is intense
- Non-parallel: other options like "Harvard Architecture" have separate memory unit for data and for instructions this prevents the lack of performance thank to its multiple "BUS", But "Von Neumann Architecture" cannot avoid the lack of performance when there is a high demand for the memory unit due to its single "BUS".