

165)

214

1. BINARY AND OCTAL
LANGUAGE THAT COMPUTER
UNDERSTAND WITH DECIMAL

33
12
20
0

65
Agred 67

1

A) THE NUMBERS SYSTEMS BINARY, HEXADECIMAL AND OCTAL ARE IMPORTANT BECAUSE THEY ARE THE LANGUAGE THAT COMPUTER SPEAK AND UNDERSTAND, SINCE THEY DON'T WORK WITH DECIMAL NUMBERS AND THE 25 LETTERS OF THE ALPHABET

$$\begin{array}{ll}
 \text{B) } 245/2 = 122.5 & 1 \\
 122/2 = 61 & 0 \\
 61/2 = 30.5 & 1 \\
 30/2 = 15 & 0 \\
 15/2 = 7.5 & 1 \\
 7/2 = 3.5 & 1 \\
 3/2 = 1.5 & 1 \\
 1/2 = 0.5 & 1 \\
 512/2 = 256 & 0 \\
 256/2 = 128 & 0 \\
 128/2 = 64 & 0 \\
 64/2 = 32 & 0 \\
 32/2 = 16 & 0 \\
 16/2 = 8 & 0 \\
 8/2 = 4 & 0 \\
 4/2 = 2 & 0 \\
 2/2 = 1 & 0 \\
 1/2 = & 1
 \end{array}$$

$$245 = 11110101$$

$$512 = 100000000$$

i) 11010101

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ = 128 + 64 + 16 + 4 + 1 = 213

128 64 32 16 8 4 2 1

ii) 101011001

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ = 256 + 64 + 16 + 8 + 1 = 345

256 128 64 32 16 8 4 2 1

D) 1110 | 1010 | 1011 ii) 1001 | 1111 | 0010

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

E A B 9 F 2

A = 10 B = 11 C = 12 D = 13 E = 14 F = 15

E) C3 = 0 × 16 + 12 = 12

12 × 16 + 3 = 195

C3 = 195

66 = 0 × 16 + 6 = 6

6 × 16 + 6 = 102

66 = 102

F) 3 BIT = 2^3 OR $2 \times 2 \times 2 = 8$

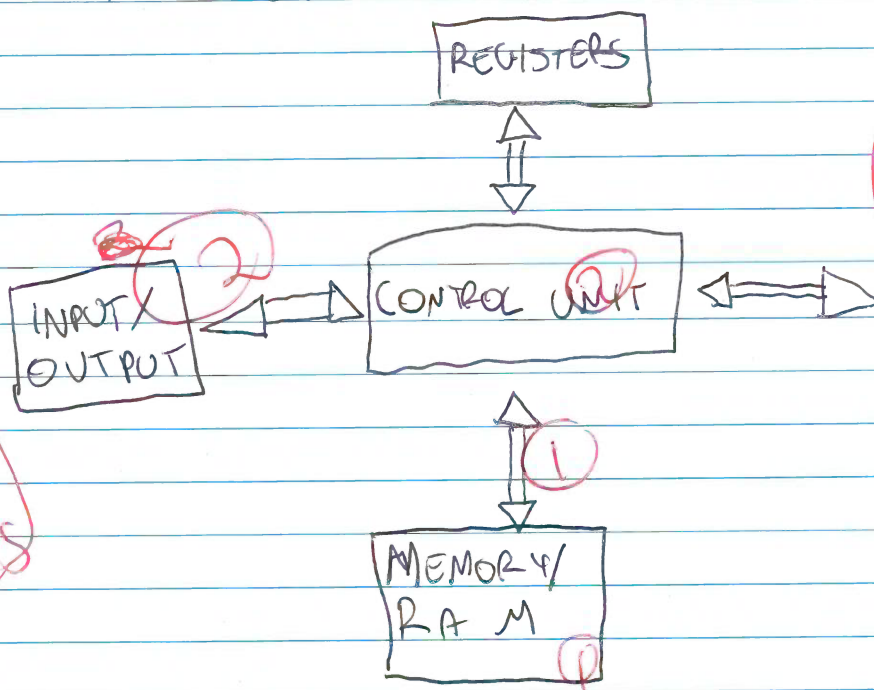
~~A 3 BIT~~ A 3 BIT NUMBER CAN REPRESENT 8 UNIQUE VALUES

G) $80 \text{ Mb/s} = 80/8 = 10$
 THE CONNECTION CAN DOWNLOAD 10 MB PER SECOND
 $10 \times 3.6 = 36$

TO DOWNLOAD THE 36 MEGABYTE FILE IT WOULD TAKE APPROXIMATELY 3 SECONDS AND A HALF

2

A

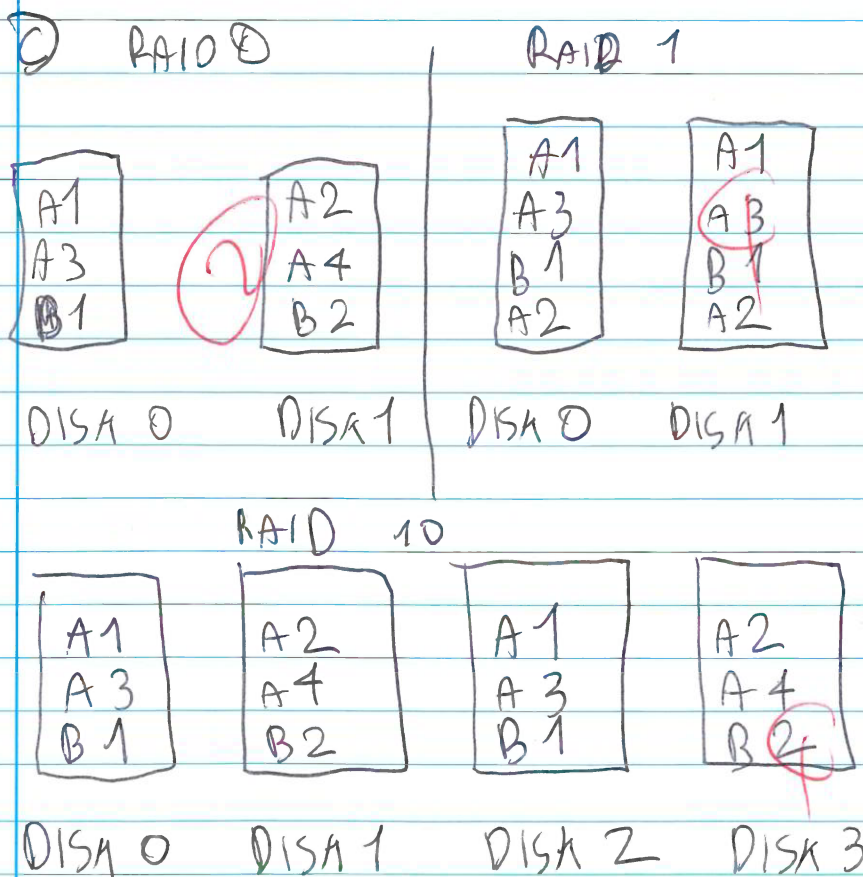


B) ~~CACHE~~ CACHE AND REGISTERS ARE BOTH PRIMARY TYPE OF MEMORY SINCE THEY ARE ACCESSED DIRECTLY BY THE CPU WHEN DOING A TASK AND ARE VOLATILE.
 REGISTERS HELP THE CPU WITH EACH STAGE OF THE FETCH-EXECUTE CYCLE AND CACHE ~~WORKS~~ WORKS LIKE RAM INTEGRATED INTO THE CPU WHERE DATA GETS STORE WITH LOWER LATENCY COMPARED TO PHYSICAL RAM

- 3] A) SECONDARY MEMORY IS MEMORY WHICH THE CPU DOES NOT ACCESS DIRECTLY MEANING ITS SLOWER AND CHEAPER COMPARED TO PRIMARY MEMORY AND MEANT FOR LONG TERM STORAGE SINCE ITS NON VOLATILE.

HARD DISK DRIVES ~~ARE~~ ARE MADE WITH PHYSICAL DISK PLATTERS WHERE A HEAD READ AND WRITES THE DATA THE MAIN DIFFERENCE COMPARED TO SSD IS THAT SSDS ARE MADE WITH NAND MEMORY CELLS THAT STORE THE DATA WHICH ARE THE SAME CHIPS RAM HAS. ~~SSD~~ SSD STORAGE IS FASTER AND LESS PRONE TO FAILURE TO HARD DISK DRIVES BUT IT IS MORE EXPENSIVE PER GIGABYTE

- B) RAID 0 STORES DIFFERENT BITS OF DATA BETWEEN ALL DRIVES INSTALLED COMPARED TO RAID 1 WHICH MIRRORS THE DATA OF ONE STORAGE DRIVE TO ALL OTHERS. RAID 10 IS A MIX OF BOTH OF THEM SINCE IN A 4 DRIVE CLUSTER IT STORE DATA IN TWO OF THEM AND THEN IT GETS MIRRORED TO THE REMAINING TWO



(20/25)

RAID 0 HAS ALL OF ITS DATA ON THE TWO DIFFERENT DRIVES

RAID 1 HAS THE DATA OF ONE DRIVE MIRRORED TO THE OTHERS

RAID 10 HAS THE DATA STORED ON DRIVE 0 AND 1 THAT WILL GET MIRRORED TO DRIVE 2 AND 3

1) ~~THE~~ THE ADVANTAGE OF RAID 0 IS THAT IT WILL ~~NOT~~ ~~DOUBLE~~ INCREASE THE READ AND WRITE SPEED THE MORE DRIVE GETS ADDED AND ITS DOWNSIDE IS THAT IT ~~DOES~~ DOES NOT GIVE ANY REDUNDANCY MEANING THAT DATA IS LOST WHEN ONE DRIVE BREAKS

~~THE~~ THE ADVANTAGE OF RAID 1 IS THAT ~~IT~~ IT IS THE SAFEST MEANING THAT WHEN ONE OR MORE DRIVE BREAKS THERE'S NO ISSUE IN REBUILDING THE DATA. THE MAIN DISADVANTAGE IS THAT NO MATTER HOW MANY DRIVES YOU ADD THE STORAGE SPACE OF THE DRIVE POOL WILL ALWAYS STAY THE SAME

THE ADVANTAGE OF RAID 10 IS THAT IT OFFERS BOTH POSITIVES OF RAID 0 AND 1 INCREASED SPEED AND REDUNDANCY. THE DISADVANTAGE FOR RAID 10 IS THAT IT ALWAYS REQUIRE AN EVEN NUMBER OF DRIVES INSTALLED AND THAT HAS A MINIMUM OF 4 REQUIRED ALSO DATA CAN STILL BE LOST IF TWO DRIVES OF THE SAME SET BREAK

6

4

(G/S)