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Ans. to the Question no :1

@ Instruction is a set of a group of command for a cpu. In other words, instruction set provides command to the processor, to tell what it needs to do.

ISA and Microarchitecture:

ISA define as Instruction Set Architecture. Basically, ISA describes the design of a computer in terms of the basis operation it must support. It is only concerned with the set or collection of basic operation.
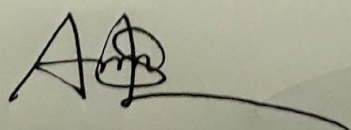
For Example: AMD, x86 etc.

on the other hand, A microarchitecture is a hardware implementation of an ISA (Instruction Set Architecture). Like, x84 ISA is implemented by various microarchitecture; including those designed by Intel and AMD.

b

① add $ S1, $S2, $S3
   meaning ⇒ $S1 = $S2 + $S3

② lw $ S1 , 20 ($S2)
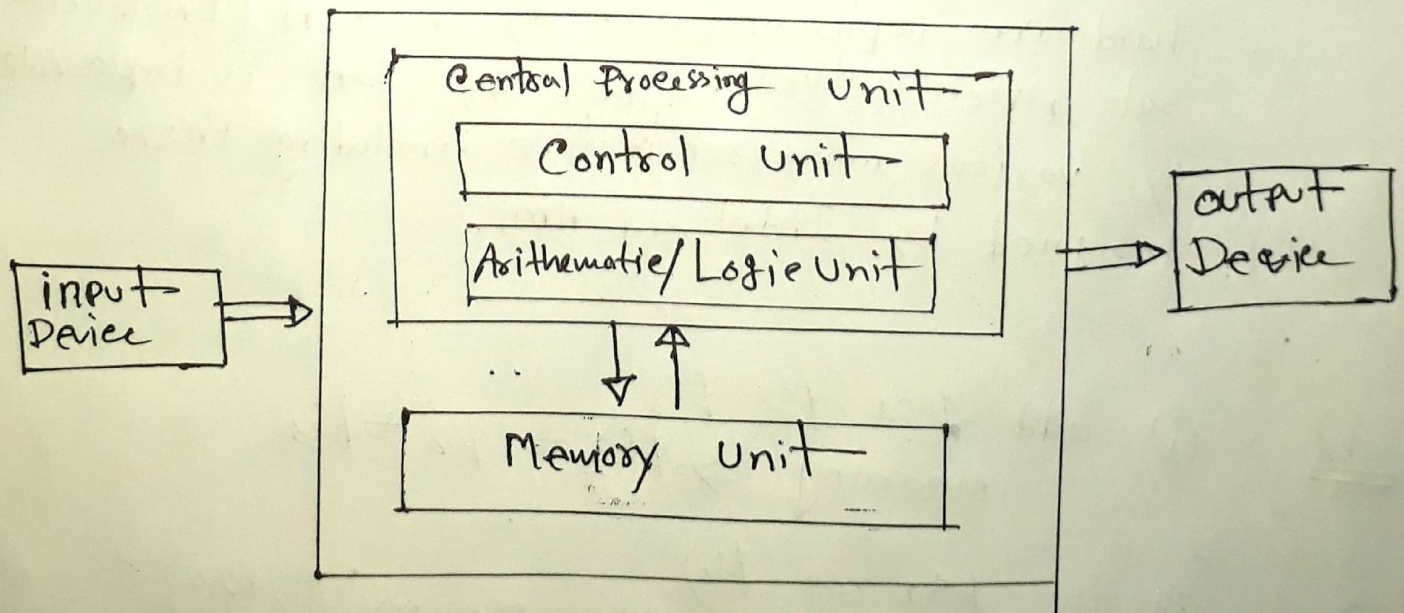   meaning ⇒ $S1 = Memory[$S2 + 20]

③

Sign → A

(iii) andi $s_1, $s_2, 10

  meaning $\longrightarrow$ $s_1 = $s_2 \& 10

(iv) sltu $s_1, $s_2, $s_3

  meaning $\longrightarrow$ if ($s_2 < $s_3) $s_1 = 1;

  else $s_1 = 0

(v) bne $s_1, $s_2, 25

  meaning $\rightsquigarrow$ if ($s_1! = $s_2) go to

  PC + 4 + 100

Ans. to the question no: 2

(a) The following diagram for Von Neumann Architecture:-

(b) Five classic components of Computer system

    1. Input
    2. Output
    3. Memory
    4. Control
    5. Datapath

(c) The term Stored Programme Control concept refers to the storage of instruction in computer memory to enable it to perform a variety of tasks in sequence or intermittantly.

(d) Moore's law: Moore's law is a term used to refer to the observation made by Godon Moore in 1965 that the number of transistors in a dense integrated circuit (Ic) doubles about every two years.

Amdahl's Law: Amdhal's law states that in parallelization, if P is the proportion of a system or programme that can be made parallel, and 1-P is the proportion that remains serial.

sign→ A&P

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Ans. to the question no: 3

Sequence 1 executes $4+2+4 = 10$ instruction
Sequence 2 executes $6+3+2 = 11$ instruction

Sequence 1: cpu clock cycle $= (4\times1) + (2\times2) + (4\times3)$
$$= 20 \text{ cycles}$$

Sequence 2: cpu clock cycle $= (6\times1) + (3\times2) + (2\times3)$
$$= 18 \text{ cycles}$$

now, Sequence 2 executes faster than sequence 1

$$cPI_1 = \frac{cpu \ clock \ cycle}{Ic_1} = \frac{20}{10}$$
$$= 2$$

$$cPI_2 = \frac{cpu \ clock \ cycle}{Ic_2}$$
$$= \frac{18}{11} = 1.63$$

Ans:

Sign —