<u>CT 3</u>

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<u>Am to the Q. No # (ii)</u>

(a) <u>Am :</u>

Here : $R[i] = R[i] + Y$ Let,
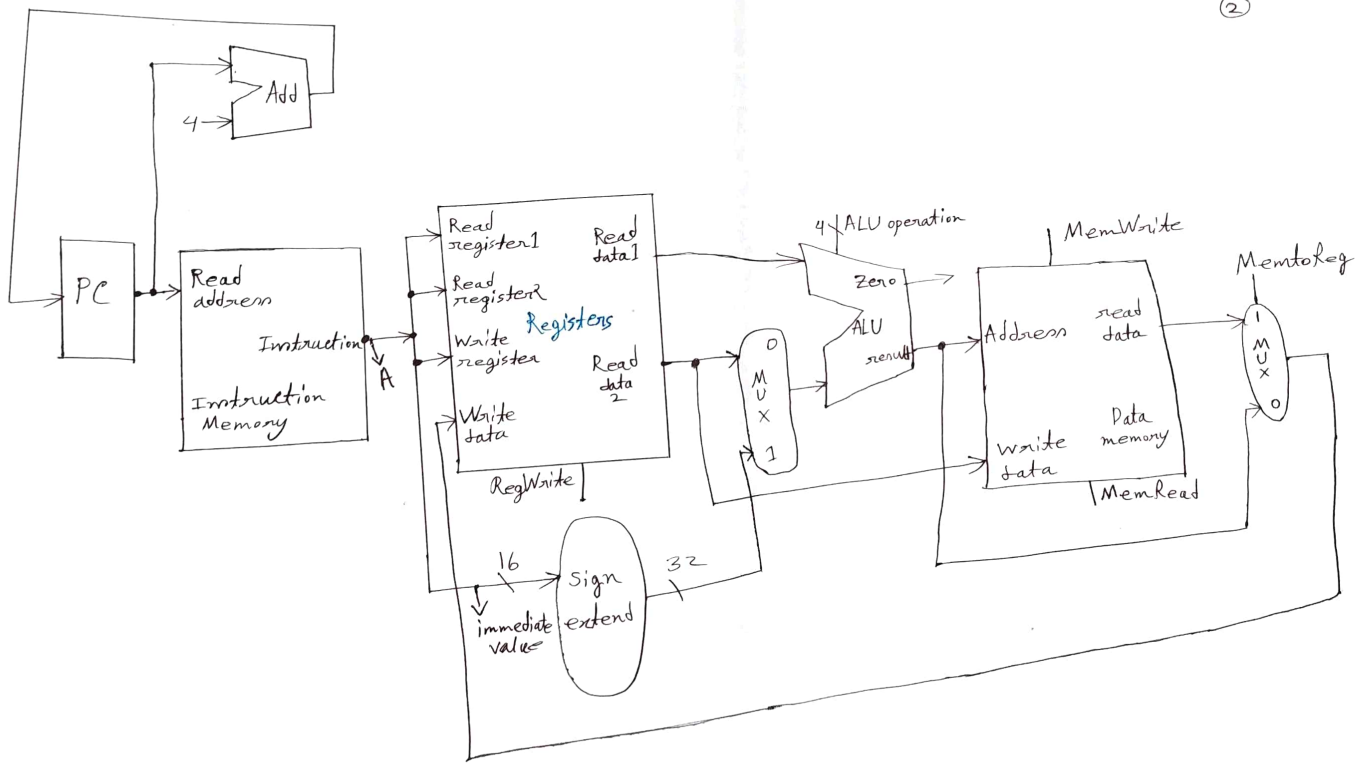   the
                                                                 offset
∴ 1. lw $to, z ($So) $i \times 4 = z$

   2. Add $to, $S₂, $to   Registers,

   3. Sw $to, z ($So) $R = So$
                                                                 $y = S_2$

Add

4 →

PC

Read address

Instruction

Instruction Memory

Read register1

Read register2

Write register

Write data

Registers

RegWrite

Read data1

Read data2

Zero

ALU result

4 ALU operation

MemWrite

Address

Write data

read data

Data memory

MemRead

MemtoReg

MUX

16

immediate value

Sign extend

32

②

At first, I type : (datapath)

lw $to, z ($so)

↓rt ↓immediate ↓rs

steps :

① At first Grab the instruction from program counter, at read address at instruction memory.

② Now decode the instruction and result at point 'A' (at diagram).

③ Now at registers, Pass, rs at read register 1, rt at write register.

~~And pas~~

④ Now pass immediate value 'z' at sign extend which make 'z' as 32 bit address and send to MUX. MUX will send it to ALU. MUX is set here.

⑤ In the mean time Read data 1 will pass the value of Read Register1 to

ALU.

⑥ ALU will pass the Result
~~At~~ at address point of Data Memory.
MemRead is set here.

⑦ Read data of Data Memory will pass
the value to MUX, where MUX
is set.

⑧ MUX will pass the value to
write data of Registers. where
RegWrite is set. Program counter
will increased to next instruction

⑨ 2nd,
No instruction steps are same
till 2nd step.
Add $tord, $S_2^{rs}, $to^{rt}

⑨ rs, rt, rd will pass to
Read register 1,2 and write
register respectivly.

⑩ then Read Data 1, 2 will pass the value to ALU, here MUX is not set

⑪ ALU will give result to 2nd MUX where MUX is not set.

⑫ MUX pass ~~the~~ the value to register.

program counter counter will increase.

Now   Sw $ t_0, Z ($s_0)
                ↓   ↓
               rt   rs

⑬ For this instruction steps one same till 6. just in step

~~⑭~~ 3 rt will be passed to read data 2.

(14) Now Data memory will be,
~~set~~ ~~to~~ MemWrite in set.

(b) Ans:

7 basic components

1. **Pc :** ~~#~~ Holds the address of the current instruction.

2. **Instruction Memory :** Provides read ~~R~~. access.

3. **ALU :** Used to Add values.

4. **Sign extend:** exted the 8 bits to double

5. **Registers :** Do read & write operation.

6. **MUX :** select value from Multiple values.

Data memory : reading, writing
Data .