Computer Organization & Assembly Language.

Task 1:
Describe the function of each resistors?
Accumulator (A, Ax, EAx, RAX)
Base (B, BX, EBX, RBX)
Count (C, CX, ECX, RCX)
Data (D, DX, EDX, RDX)

1) Accumulator Register:

- Stores Operands and results of arithmetic & logical operations.
- Commonly used in calculations and data transfer.
  ∴ In 8-bits A, 16-bits AX, 32-bits EAX

2) Base Register: 64-bits RBX

- Used to hold a base address in memory
- Helps when accessing data stored at specific memory location
- In 16-bits mode BX
  32-bits mode EBX
  64-bits mode RBX

3) Counter Register:

- Mainly used as a loop counter.
- Also used in shifting, rotating and string Operation.
- In loops, CX/ECX/RCX stores the number of iterations.

4) **Data Registers:**

- Used for I/O operations, multiplication and di
- Often works together with AX/EAX/RAX for larger results.
- In 8-bits mode D
  16-bits mode DX
  32-bits mode EDX
  64-bits mode RDX

Task 2:

Q#02: Role of Index Registers (SI & DI) in Source and Destination Operations

- **Source Index:**
  points to the source memory location.
- **Destination Index:**
  points to the destination memory location.

Both are used in string operation like copying or comparing data.

For example: Add dl, 2 → Source
destination

∴ Mul dh, 4 → Source
destination

∴ Div 2, dl → destination
Source

∴ mov ah, 3 → Source.
destination

Task 3:

Briefly describe the function of these bits: overflow flag (OF), zero Flag (ZF), Carry Flag (CF)?

Overflow Flag:

It used to handle large amount or overflow of carry's

e.g :
```
  1 1 1 1 1 1 1 1
  1 0 1 0 1 1 0 1
+ 1 0 1 1 0 1 0 0
  1 1 0 0 1 1 1 1
```

Zero Flag:

If we have "0" in the result then zero flag will store "1" and if we have "1" or only one "1" it will be store "0"

e.g
```
  0 0
  0 0
-------
  0 0
```

e.g
```
  1 0
  1 1
-------
  0 1
```

Carry Flag:

If we do operations in A.L if it has carry that will be handled by Carry Flag.

2 => 10 → carry flag
3 => 11 will handle
01 it.