Department: - Electronics and Communication Engineering
Question Set: -10
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Subject: - Digital Technologies and Microprocessor
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1. What is the need for ALE signal in 8085 microprocessor?
The ALE signal goes high at the beginning of each machine cycle indicating the availability of the address on the address bus, and the signal is used to latch the low order address bus.

2. List the five interrupt pins available in 8085.
INTR, TRAP, RST 7.5, RST 6.5, RST 5.5.

3. Differentiate Software and Hardware interrupts.
The Software interrupt is initiated by the main program, but the hardware interrupt is initiated by the external device. In 8085, Software interrupts cannot be masked or disabled, but in hardware interrupts except TRAP all other interrupts can be masked. In 8086, Software interrupts cannot be masked or disabled, but in hardware interrupts except NMI all other interrupts can be masked.

4. What is mean by TRAP interrupt and its significance?
TRAP is a Non maskable interrupt of 8085. It is not disabled by processor reset or after recognition of the interrupt.

5. What is the need for interfacing?
Generally I/O devices are slow devices. Therefore the speed of I/O devices does not match with the speed of microprocessor. And so an interface is provided between system bus and I/O devices.

6. Compare memory mapped I/O and peripheral mapped I/O.
Memory Mapped I/O: 16-bit device address, data transfer between any general-purpose register and I/O port. The memory map (64K) is shared between I/O device and system memory. More hardware is required to decode 16-bit address Arithmetic or logic operation can be directly performed with I/O data.

Peripheral Mapped I/O: 8-bit device address, Data is transfer only between accumulator and I.O port, The I/O map is independent of the memory map; 256 input device and 256. Output device can be connected Less hardware is required to decode 8-bit address, Arithmetic or logical operation cannot be directly performed with I/O data.

7. What is interrupt?
Interrupt is a signal send by an external device to the processor so as to request the processor to perform a particular task or work.

8. Name the vectored and non vectored interrupt of 8085 system.
When an interrupt is accepted, if the processor control branches to a specific address defined by the manufacturer then the interrupt is called vectored interrupt. In Non-vectored interrupt there is no specific address for storing the interrupt service routine. Hence the interrupted device should give the address of the interrupt service routine.

9. What is the need for a timing diagram?
The timing diagram provides information regarding the status of various signals, when a machine cycle is executed. The knowledge of timing diagram is essential for system designer to select matched peripheral devices like memories, latches, ports, etc, to form a microprocessor system.

10. Define (i) Instruction cycle (ii) Machine cycle and list
- (i) The sequence of operations that a processor has to carry out while executing the instruction is called Instruction cycle. Each instruction cycle of a processor indium consists of a number of machine cycles.
- (ii) The processor cycle or machine cycle is the basic operation performed by the processor. To execute an instruction, the processor will run one or more machine cycles in a particular order. opcode fetch, memory read, memory write, I/O read, I/O write, interrupt acknowledge, halt, hold and reset.

11. What do you mean by masking the interrupt? How it is activated in 8085?
Masking is preventing the interrupt from disturbing the current program execution. When the processor is performing an important job (process) and if the process should not be interrupted then all the interrupts should be masked or disabled. In processor with multiple interrupts, the lower priority interrupt can be masked so as to prevent it from interrupting, the execution of interrupt service routine of higher priority interrupt.

12. What is Address Bus?
The address is an identification number used by the processor to identify or access a memory location or I/O device. It is an output signal from the processor. Hence the address bus is unidirectional.

13. What is the function of program counter in 8085 processor?
The microprocessor uses this register to sequence the execution of the instructions. The function of the program counter is to point to the memory address from which the next byte is to be fetched. When a byte (machine code) is being fetched, the program counter is incremented by one to point to the next memory location.

14. What are the limitations of 8085 MPU?
(i) The lower order address bus of the 8085 microprocessor is multiplexed (time shared) with the data bus. The buses need to be demultiplexed. (ii) Appropriate control signals need to be generated to interface memory and I/O with the 8085.

15. Why is the data bus bi-directional?
The microprocessor has to fetch (read) the data from memory or input device for processing and after processing, it has to store (write) the data to memory or output device. Hence the data bus is bi-directional.

16. What is a flag?
The data conditions, after arithmetic or logical operations, are indicated by setting or resetting the flip-flops called flags.

17. Explain the function of ALE and IO/M signals in the 8085 architecture?

The ALE signal goes high at the beginning of each machine cycle indicating the availability of the address on the address bus, and the signal is used to latch the low order address bus. The IO/M signal is a status signal indicating whether the machine cycle is I/O or memory operation. The IO/M signal is combined with the RD and WR control signals to generate IOR, IOW, MEMW, MEMR.

18. What is pipelined architecture?

In pipelined architecture the processor will have number of functional units and the execution times of functional units are overlapped. Each functional unit works independently most of the time.

19. Specify the size of data, address, memory word and memory capacity of 8085 microprocessor.

8085 operate 8bit data. The 8085 has 16 address lines, hence it can access (216) 64 Kbytes of memory

20. What are the various flags used in 8085?

The 8085 has five flags and they are Carry Flag (CF), Overflow Flag (OF), Parity Flag (PF), Auxiliary carry Flag (AF), Zero Flag (ZF),

21. To obtain a 320 ns clock, what should be the input clock frequency? What is the frequency of clock signal at CLK OUT?

The input clock frequency should be twice of the operating frequency. So, to obtain a 320ns frequency, i.e. (3.125 MHz), the input clock frequency should be 6.25 MHz, The frequency of CLK OUT must be the operating frequency i.e., half the input frequency.

22. What is meant by level-triggered interrupt? Which of the interrupts in 8085 are level triggered?

In level triggering the circuit will become active when the gating or clock pulse is on a particular level. A negative level triggering is, in which the circuit is active when the clock signal is low and a positive level triggering is, in which the circuit is active when the clock signal is high. The level triggered interrupts in 8085 are RST 6.5, RST 5.5, INTR, and TRAP (both edge and level triggered).

23. List the control and status signals of 8085 microprocessor and mention its need.

Control signals: RD and WR, **Status signals:** IO/M, S1 and S2. They are used to perform write and read operation through any IO devices or through memory.

24. What is the maximum number of byte of memory addressable by the 8086 processor?

The 8086 has 20 bit address lines and it can allow 220 or 1MB memory locations and contains 8 bit data or one byte data.

25. What is the use of Stack pointer?

The stack pointer is also a 16-bit register used as a memory pointer. It points to a memory location in

- Read or Write memory called the stack. The beginning of the stack is defined by loading 16-bit address in the stack pointer.