UNIT-5

Input / Output: Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.

1. What is interface? Explain the working of Interface?

2. What are different modes of transfer explain?

3. describe in detail about programmed Input/output with neat diagram?

4. Explain the Interrupt initiated IO mode of transfer?

5. Explain the following method of Asynchronous data transfer

   a. Strobe Control b. Handshaking

6. What is DMA? Explain the working of DMA Controller and DMA Transfer?

7. What is the basic advantage of using interrupt-initiated data transfer over transfer under program Control Without an interrupt?

8) What is IOP explain its block diagram and working? Give with flow chart the IOP-CPU communication?

(9). What do you mean by Priority interrupt? Explain the Daisy chaining priority interrupt and Parallel Priority interrupt with Block diagram?

(10). What is difference between isolated I/O and memory-mapped I/O? What are the advantages and Disadvantages of each?

11. In most computers an interrupt is recognized only after the execution of the instruction. Consider the possibility of acknowledge the interrupt at any time during the

Execution of the instruction. Discuss the difficulty that may arise.

12. What happen in the daisy-chain priority interrupt when device1 requests an interrupt

After device2 has sent an interrupt request to the CPU but before the CPU responds with the interrupt acknowledge?

13. Consider a computer without Priority hardware. Any one of many sources can interrupt the computer, and any interrupt results in storing the return address and branching to a common interrupt routine. Explain how a priority can be established in the interrupt service program.

14. Design a parallel priority interrupt hardware for system with eight interrupt sources.

15. Why are the read and write control lines in a DMA controller bidirectional? Under what condition and For what purpose are they used as inputs? Under what condition

and for what purpose are they used as Outputs?
16.Why does DMA have priority over the CPU when both request a memory transfer?
Q17. What is peripheral device? Give the example of peripheral devices.
Q18. Why DMA is required? Explain its functions with the help of block diagram.
Q19. Explain the difference between the programmed I/O and interrupt driven I/O.
Q20. What are interrupt? What are the different types of interrupts?

NUMERICAL PROBLEMS

1. it is necessary to transfer 256 words from a magnetic disk to memory section starting

Form address 1230. The transfer is by means of DMA

a. Give the initial values that the CPU must transfer to the DMA controller.
b . Give the step-by-step account taken during the input of the first two words.

2. A DMA controller transfers 16-bit words to memory using cycle stealing. The Words are assembled from a device that transmits characters at a rate of 2400 character
Per second. The CPU is fetching and executing instructions at an average rate of 1 million instruction per second. By how much will the CPU be slowed down because of the DMA transfer?

3).Information is inserted into a FIFO buffer at a rate of m bytes per second. The information is deleted at a Rate of n byte per second. The maximum capacity of the buffer is k bytes.

a. How long does it take for an empty buffer to fill up when m > n?
b. How long does it take for a full buffer to empty when m < n?
c. Is the FIFO buffer needed if m = n?