19IT301 - COMPUTER ORGANISATION ANS ARCHITECTURE

Unit – I

BASIC STRUCTURE OF COMPUTER

1. Explain the basic functional units of a simple computer. (16)
2. Explain the basic I/O operations of modern processors. (16)
3. Explain various addressing modes found in modern processors (16)
4. Discuss various issues to be considered while assigning the ISA of a processor 08
5. Difference between CISC and RISC (06)
6. Describe detail about instruction and instruction sequencing (16)
7. Describe detail about the performance of the system.(16)

Unit -2
ARITHMETIC UNIT
1. (a)Discuss the principle of operation of carry-look ahead adders. (08) (b)Discuss the non-restoring division algorithm. (08)
2. (a) Multiply the following pair of signed 2‟s complements numbers using bit pair recoded multiplier: Multiplicand = 110011 Multiplier = 101100. (08) (b)Describe the algorithm for integer division with suitable example. (08)
3. With a neat sketch, Explain in detail about logic design for fast adders. (16)
4. Describe how the floating-point numbers are represented and used in digital arithmetic operations. Give an example. (16)
5. (a) Explain the representations of floating point numbers in detail. (06)
(b) Give the block diagram of the hardware implementation of addition and subtraction of signed number and explain its operations. (10)
6. (a) Design a multiplier that multiplies two 4-bit numbers. (06)
(b) Explain the working of floating point adder and subtractor. (10)
7. Explain the Booth Algorithm for multiplication of Signed two‟s Complement number

Unit - 3
BASIC PROCESSING UNIT

1. Give the organization of typical hardwired control unit and explain the functions performed by the various blocks. (16)
2. Discuss the various hazards that might arise in a pipeline. What are the remedies commonly adopted to overcome/minimize these hazards. (16)
4. With a neat block diagram, explain in detail about micro programmed control unit and Explain its operations. (16)
5. (a)Explain the execution of an instruction with diagram. (08)
   (b) Explain the multiple bus organization in detail. (08)
7. (a) Explain the function of a six segment pipeline showing the time it takes to process eight tasks. (10)
(b) Highlight the solutions of instruction hazards. (06)
8. (a)Explain the instruction cycle highlighting the sub-cycles and sequence of steps to be followed. (08)
(b)Illustrate memory read and write operation. (08)
9. Explain the concept of Superscalar Architecture.
10. Describe the basic structure of the pipeline processor and explain how it carried out in floating point adder.
11. Given the sequence of control signals to be generated to fetch an instruction from memory in a single-bus organization

Unit - 4
MEMORY SYSTEM
1. Discuss the various mapping techniques used in cache memories. (08)
2. (a)Explain the concept of virtual memory with any one virtual memory management technique. (08)
(b)Give the basic cell of an associative memory and explain its operation. Show how associative memories can be constructed using this basic cell. (08)
3. Give the structure of semiconductor RAM memories. Explain the read and write operations in detail. (16)
4. (a)Explain the organization of magnetic disks in detail. (08) (b)Write a short note on PCI (08)
5 Explain the concept of memory hierarchy. (06)
6. Explain about the secondary storage devces
7. Describe the performance consideration of cache memory.
8. Give the structure of semiconductor ROM memories. Explain read and write operation.

9. Explain the virtual memory address translation and TLB with necessary diagram.

10. Explain the basic concepts of memory system.

UNIT – 5
I/O Organisation and Parallelism

1. Explain the functions to be performed by a typical I/O interface with a typical input output interface. (16)

2. (a)Discuss the DMA driven data transfer technique. (08) (b)Discuss the operation of any two input devices (08)

3. Explain in detail about interrupt handling. (16)

4. Explain in detail about standard I/O interface. (16)

5. Describe the functions of SCSI with a neat diagram. (16)

6. (a)What is the importance of I/O interface? Compare the features of SCSI and PCI Interfaces.(08)

(b) Explain the use of vectored interrupts in processes. Why is priority handling desired in interrupt controllers? How does the different priority scheme work? (08)

7. Write note on the following.

• Bus arbitration

• Printer process communication

• USB

• DMA (16)

8. Explain how DMA transfer is accomplished with a neat diagram.

9. Write short notes on, i)PCI

ii)SCSI

10. Describe Bus Arbitration.

11. Explain the use of vectored interrupts in processors. Why is priority handling desired in interrupt controllers? How do the priority schemes work?

12. Explain briefly about Tomasulo's approach. [16]

13. (i) Explain the implementation methods of Tomasulo's approach. [10]

(ii) Explain ILP with a suitable example. [6]

14. Explain the mechanism and steps involved in speculation. [16]
15. Explain the compiler technique that is used to expose ILP. [16]
16.. Explain briefly about dynamic branch prediction. [16]
17. What is ILP? Explain the dependence and data hazards in ILP [16]