Assignment 5

1. Define 2.5 D Memory Organization?

2. What is pipelining? What are the different stages of pipelining.

3. What is the basic difference between interrupt initiated I/O and programmed I/O? Explain in detail.

4. Discuss the design and logic of a microprogram sequencer.

5. Write one example of a 1-Address and 2-Address instruction.

6. Define the term Memory Hierarchy in computer system.

7. Compare microinstruction and microprogram.

8. Differentiate between horizontal and vertical microinstruction.

9. Discuss the need of virtual memory. Demonstrate its implementation using paging.

10. Describe serial communication technique in detail.

11. Explain and compare the synchronous and asynchronous communication.

12. Demonstrate floating-point number representation in computer, also give IEEE 754 standard 32-bit floating point number format of (12.21)10 justifying each step.

13. Calculate the number of page faults using optimal page replacement algorithm for the reference string: 1,5,4,3,2,5,1,2,4,3,6,4 if the number of frames in the memory is 3 and 4 illustrating each step.

14. Explain Cache performance measures. Evaluate the performance of 2-level Cache memory.

15. What is an Associative memory? What are its advantages and disadvantages?

16. Differentiate between static RAM and Dynamic RAM.

17. What are the different types of instruction formats?

18. Explain destination-initiated transfer using handshaking method.

19. Show the multiplication process using Booth algorithm, when the following binary numbers, (-17) x (-11) are multiplied.

20. Show the multiplication process using Booth algorithm, when the following binary numbers, (+13) x (-15) are multiplied.

21. Show the multiplication process using Booth algorithm, when the following binary numbers, (-21) x (+11) are multiplied.

22. Show the multiplication process using Booth algorithm, when the following binary numbers, (+19) x (+07) are multiplied.

23. Explain in detail multiple bus organization with the help of a diagram.

24. Write a program to evaluate arithmetic expression using stack organized computer with 0-address instructions.

$$X = (A-B) * (((C - D * E) / F) / G)$$

25. What are the different methods of asynchronous data transfer? Explain in detail.

26. Explain the peripheral devices in a computer system?

27. Discuss the characteristics and functionalities of auxiliary memories such as magnetic disks, magnetic tapes, and optical disks?

28. Provide a detailed overview of processor organization, covering topics such as instruction fetch, decode, execute cycles, pipelining, and parallel processing techniques?

29. Explain the Direct Memory Access (DMA) techniques for data transfer?

30.   Write a program to evaluate the arithmetic statement.

a. $P = ((X - Y + Z) * (A \wedge B))/(C \wedge D * E)$

b. $X = A+B* [C* D+E* (F +G)]$

By using   (i) Two address instructions

(ii) One address instructions

(iii) Zero address instructions

31.   What do you mean by page fault?

32.   Calculate the page fault for a given string with the help of LRU, FIFO & Optimal page replacement algorithm, Size of frame = 4 and string 1 2 3 4 2 1 5 6 2 1 2 3 7 6 3 2 1 2 3 6.

33.   What is restoring method in division algorithm?

34.   What is non-restoring method in division algorithm?

35.   Define hit ratio.

36.   Draw and explain the block diagram of typical DMA controller.

37.   What is mean by bus arbitration? List different types of bus arbitration.

38.   Define miss ratio.

39.   Write short note on RISC.

40.   Define micro-operation and micro code.