Question Bank
BCA II Year (3rd Semester)
Subject:-Computer Organization & Architecture

1. Compare and contrast between sequential circuit and combinational circuit.

2. Draw and explain instruction cycle and interrupt cycle.

3. What is mode of transfer? Explain the various modes of transfer in detail.

4. What is stack organization? Explain the functioning of register stack and memory stack with suitable example.

5. Write short notes on any FOUR of the following
a) Auxiliary memory
b) Input-Output processor (IOP)
c)Vectored interrupts
d)RISC characteristics
e)Memory management hardware

6. A digital computer has a common bus system for the 16 registers of 32 bits each. The bus is constructed with multiplexers.
    a.   How many selection inputs are there in each multiplexer?
    b.   What size of multiplexers is needed?
    c.   How many multiplexers are there in the bus?

7. Explain the term selective set, selective compliment, selective clear micro operation?

8. Write a note on:
        a) Shift and rotate instruction
        b) Logical instruction
        c) Machine instruction encoding.

9. Explain the IEEE standards for floating point number.

10. With a neat diagram explain the hardwired control unit.

11. Give the details of number representation with their equivalent singed value.

12. Distinguish between the multiprocessors and multicomputers.

13. Write short notes on following
    a. MAR   b. MIR   c. PC

14. Explain the memory operations load and store in brief.

15. Give the draw back of straight line sequencing and how it can overcome with the branching.

16. How an instruction is executed explain briefly?

17. What is meant by straight – line sequencing?

18. Differentiate micro programmed control from hardwired control.

19. Differentiate horizontal microinstruction from vertical microinstruction.

20. Explain the multiple bus organization in detail.

21. Explain the instruction cycle highlighting the sub-cycles and sequence of steps to be followed.

22. Explain the hardwired control in detail.

23. Explain the following:
(a) Isolated Vs Memory mapped I/O
(b) I/O Bus Vs Memory Bus
(c) I/O Interface
(d) Peripheral Devices

24. Write an instruction sequence for evaluating A + B x C + D / E x F using zero address instructions and one address instructions.

25. The 8 bit registers AR, BR, CR and DR, initially have the following values:
AR = 10110110
BR = 10010101
CR = 11100101
DR = 00111010

26. Determine the 8 bit values in each register after the execution of the following sequence of micro operations :
(i) AR ? AB ^ BR
(ii) BR ? CR ? DR
(iii) DR ? DR - CR
(iv) CR ? AR x DR where '^' denotes AND and '?' denotes XOR.

27. Using four (4 x 1) multiplexers and four full adders, construct a 4 bit arithmetic circuit, with the help of suitable tables, explain how this circuit can perform different arithmetical operations.

28. Convert the following expression from infix to reverse Polish notation.
    A*B + C*D +E*F

29. Convert the following numerical arithmetic expression into reverse Polish notation and show the stack operations for evaluating the numerical result.
    (3+4)[10(2+6)+8]

30. Define auto increment & auto decrement mode of addressing?

31. Which data structure is best supported using indirect addressing mode?

32. Differentiate between RISC and CISC?

33. What are the types of microinstructions available?

34. Explain the multiple bus organization in detail.

35. Write a steps to evaluate (A+B)*(C+D) using one address instructions.

36. What is the need of addressing mode?

37. Explain status bit condition in program control.

38. Draw a neat diagram of connection of I/O bus to input-Output devices.

39. Differentiate b/w strobe vs handshaking process.

40. Write a diagram for destination initiated strobe for data transfer.

41. Explain Start bit and stop bit in Asynchronous data transfer.

42. What are modes of transfer, how many types of it?

43. Explain in detail about standard I/O interface.

44. What is port? What are the types of port available?

45. What are the different methods used for handling the situation when multiple interrupts occurs?

46. Write the factors considered in designing an I/O subsystem?

47. Define Hit and Miss rate?

48. Give the organization of typical hardwired control unit and explain The functions performed by the various blocks.

49. With a neat block diagram, explain in detail about micro programmed Control unit and explain its operations.

50. Explain the instruction cycle highlighting the sub-cycles and Sequence of steps to be followed.

51. Give five examples of external interrupts and five examples of internal Interrupts. What is the difference between a software interrupt and a Subroutine call?

52. Explain the working of register set with common ALU with neat diagram.

53. A stack is organized such that SP always points at the next empty location on the stack. This means that SP can be initialized to 4000. and the first item in the stack is stored in location 4000. List the micro operations for the push and pop operations.

54. Draw any two DMA configurations and explain the advantages and disadvantages of these configurations.

55. What is parallel processing? Also explain the categories of Flynn's classification

56. Discuss the instruction fetch and execute cycles in a digital computer.

57. Briefly explain the terms unit of transfer and access modes for the memory system

58. Write the steps involved in the communication of l / O module with the peripheral for a read or write operation.

59. Explain any two addressing schemes for the computer system, with suitable examples.

60. What is an interrupt? How is it processed?

61. Discuss the operation of Programmed I/O and Interrupt driven I/O techniques using flow chart. Compare them briefly.

62. What are the functions of an I/O interface?

63. Explain the use of the following registers for a computer system:
(1)MAR
(2)MBR
(3)PC
(4)IR
(5)AC

64. Discuss the various Addressing schemes used in 8086, with the help of examples

65. What do you understand by micro-programming? Discuss about micro-programmed control unit, using a block diagram. Compare it with the hardwired control unit

67. Explain the following:
(1)Flash Memory
(2)Direct Memory Access
(3)Instruction Pipeline
(4)Hardwired Control Organization

68. What is the difference between direct and indirect address instruction ? Show how many memory references are required for each type of instruction to bring an operand into processor register.

69. Give two reasons why a RISC processor is better than a CISC processor.

70. What is interrupt? Briefly explain the four interrupt conditions.

71. An instruction is stored at location 300 with its address field at location 301 . The address field has the value 400. A processor register R1 contains the number 200. Evaluate the effective address if the addressing mode of the instruction is
(a)Direct
(b)Register indirect
(c)Relative
(d)Index with R1 as index register

72. Draw the block diagram of a hardwired control unit. What are its advantages and disadvantages?

73. An 8-bit register contains the binary value 11011101. What is the register value after arithmetic shift right?

74. Explain the six differences between hardwired and micro programmed control. Is it possible to have a hardwired control associated with control memory? Justify your answer.

75. Explain four possible hardware schemes that can be used in an instruction pipeline in Order to minimize the performance degradation caused by instruction branching

76. Why are read and write control lines in DMA controller bidirectional? Under what condition and what condition and for what purpose are they used as outputs?

77. What is a micro-operation? Explain all the categories of a micro-operation, giving one example each.

78. Give four differences between programmed input / output and interrupt driven input / output.

79. What is the need of a control unit in a computer? What is a hardwired control unit? What are its advantages and disadvantages?

80. Explain four characteristics of the RISC architecture. Why do we use a large register file in RISC? Explain this with the help of a suitable example

81. Explain the relative addressing scheme and stack addressing scheme, with the help of an example each.

82. Explain, with an example, the following logic-micro operation.
(a)Selective complement
(b)Mask operations
(c)Insert
(d)Clear

83. What is a micro-instruction? Explain the three micro-instruction formats, with the help of suitable diagrams.

84. Compare and contrast isolated I/O and memory mapped I/O.

85. What is the difference between multiprocessing and parallel processing?

86. Explain how parallel processing affects the speed of computer processing?