

# Computer System Architecture

1. What is the limitation of direct-mapped cache? Explain with an example. How it can be improved into set associative-cache.
2. Define speed-up, efficiency and throughput of a pipelined processor.
3. Register direct, register indirect and base register addressing mode.
4. Explain instruction cycle with flow chart.
5. Explain memory hierarchy.
6. Difference between RISC and CISE.
7. Compare and contrast between memory mapped I/O and I/O mapped I/O.
8. Explain different type of bus.
9. What do you mean by race around condition? How this problem can be solved using master slave flip flop.
10. Minimize the following functions using k-map  
 $F(A,B,C,D) = \sum m(3,4,5,6,7,12,13,14,15)$
11. Draw the master slave JK flip flop using NAND gate.
12. Draw the circuit diagram of full adder. Obtain a full subtractor using half subtractor
13. What is multiplexer ? why it called data selector.
14. Multiply 7 and 3 using Booth's multiplication algorithm
15. Divide 11 by 3 using restoring and non-restoring division algorithm
16. Difference between combinational circuit and sequential circuit.
17. Write down the excitation table of JK flip flop and T flip flop
18. What is counter explain mod 6 ripple counter.
19. Difference between latch and flip flop.
20. Subtract  $1110001_2$  from  $1010111_2$  using 2's complement
21. Implement the following function using 4:1 MUX
22.  $F(A,B,C,D) = \sum m(1,3,5,6)$
23. Difference between micro programmed control and hardwired control.
24. Short note
  - a) Instruction format, RISC, fixed point representation, DMA, addressing mode, ring counter, machine language, assembly language, 8:3 encoder, computer registers
25. Explain basic block diagram of computer system.
26. Evaluate the arithmetic statement  $X = (A+B)/(C+D)$  in one, two and three addressing mode
27. Represent the decimal value -14.25 IEEE-754 single precision floating point formats.
28. Explain memory reference and register instructions
29. What is write back and write through caches?
30. Convert the following arithmetic expressions from infix to reverse polish notation:-
  - (i)  $A*B+C*D+E*F$
  - (ii)  $A*B+A*(B*D+C*E)$