NKOCET Solapur

Electrical Engineering Department

Subject –Analog and digital Electronics

Question Bank

1. Explain the principle of operation of transistor as an amplifier.
2. Compare CB , CC and CE amplifier
3. Draw 2 stage amplifier RC coupled amplifier and explain its working.
4. Draw the circuit diagram of two stage directly coupled amplifier and mention the advantage of it over R-C coupled amplifier.
5. Define Ri, Ro, A, Av and Ap for a voltage amplifier. Q. 28 What should be the values of R, and R, for an ideal and practical voltage amplifier and explain why?
6. Explain the operation of emitter follower amplifier.
7. Explain the h-parameter model of CE amplifier and state the typical values of h-parameter for the same.
8. Derive the expressions for A, Av, R, and R, for a CC amplifier using hybrid π model.
9. Explain any six characteristics of an ideal OP-AMP.
10. Compare the ideal and practical values of characteristics of OP-AMP
11. Draw the block diagram of an OP-AMP and explain the purpose of using each block.

12. State important characteristics of IC 741 and compare their values with those of an ideal OP-AMP.
13. What are the factors affecting the input offset voltage, input bias current and input offset current?
14. Define thermal drift and explain its significance.
15. What is common mode operation? Define common mode gain.
16. Explain OP-AMP is used as a summing amplifier.
17. State the requirements of good instrumentation amplifier.
18. State De Morgan's theorems and prove it.
19. Write the Boolean expressions for OR,NOT, XOR and NAND
20. Explain with circuit diagrams a two input EX-NOR gate using only NOR gates.
21. Implement AB+ CD with only three NAND gates. Draw logic diagram
22. Draw the equivalent circuit of all gates using NAND gate.
23. Which are the different logic families? Write their characteristics.
24. Compare the performance of TTL, CMOS and ECL logic.
25. Explain the features of complementary symmetry
26. Draw the circuit diagram of two input TTL NAND ga and explain the function of each component in it.
27. Explain the ECL circuit.
28. Draw the circuit of SR flip-flop using NAND
29. Drew the schematic diagram of JK flip-flop and describe its working. Write down its truth table

30. Drew the circuit of J-K flip-flop using NAND gate
31. Explain the working of the master slave JK flip-flop.
32. Design a conversion logic to convert a JK flip-flop to a D flip-flop.
33. What is the basic difference between pulse-triggered and edge-triggered flip-flops?
34. Draw the circuit for mod-12 counter. Explain the same with neat waveforms.
35. Compare synchronous and ripple counters.
36. Design a 3 bit synchronous counter using JK flip-flops.
37. What is the function of a shift register? Give its applications.
38. What is race-around problem. Mention it's remedies.
39. Explain 4-bit SISO shift register.
40. Construct 4 bit Asynchronous counter. explain it's functioning with help of truth table & timing waveforms
41. Explain ring counter with diagram and truth table.
42. Draw D flip flops. Explain its working.
43. What is meant by a multiplexer ? Explain with block diagram the principle of multiplexing.
44. What is a 'Multiplexer tree' ?
45. Explain with diagram the working of 1 to 8 demultiplexer.
46. What is the necessity of multiplexer ? Draw the circuit diagram of 1 to 4 line demultiplexer
47. With a neat block diagram explain the function of an encoder.
48. Design a Gray to BCD converter and implement it using required gates.

49. Explain the K-map reduction technique.
50. Solve the following with K maps: 1. f (A,B,C) = Σm (0,1,3,4,5) 2. f(A,B,C) = m (0,1,2,3,6,7)
51. Design BCD to Excess-3 code converter using minimum number of NAND gates.