QUESTION BANK

Subject- Analog Circuits

Subject Code: BTEC-401-18

1. What is meant by unbiased PN junction?
2. What is meant by depletion layer in unbiased PN junction?
3. Define forward static and dynamic resistances of diode.
4. Define diffusion capacitance and transition capacitance.
5. Draw the V-I characteristics of PN junction Diode.
6. Write down the expression for Diode Current.
7. Write any two differences between Zener breakdown and Avalanche breakdown.
8. Define the ripple factor for a half-wave and full-wave rectifier.
9. Compare the performance of half-wave rectifier and full-wave rectifier.
10. Define Transformer utilization factor.
11. What are the advantages of Bridge rectifier?
12. How shunt regulator is differentiated from series regulator?
13. Draw the block diagram of shunt voltage regulator.
14. Draw the block diagram of series voltage regulator.
15. Compare the rectifier and regulator.
16. Write the diffusion current expression and state how this current is formed?
17. Write the temperature dependence of reverse saturation current of PN junction diode.
18. Differentiate drift current and diffusion current.
20. Define forward and reverse recovery time of a diode.
21. Define knee voltage and breakdown voltage with respect to diode.
22. Define peak inverse voltage of diode.
23. (i) Explain about the switching characteristics of the diode.
(ii) Explain about the effect of temperature on diode characteristics.
24. In a transistor operating in the active region although the collector junction is reverse biased the collector current is quite large. Explain.
25. Draw the hybrid model for transistor.
26. Define the various h-parameters in a transistor.
27. Draw the output characteristics of a transistor in CE configuration.
28. Draw the small signal low frequency hybrid model of common base configuration.
29. Among CE, CB and CC configurations which is most popular? Why?
30. What is meant by biasing a transistor?
31. What is the significance of h-parameters?
32. Which factors determine the switching speed of the transistor?
33. What are the limitations of switching parameter?
34. What is the need for small signal model of BJT?
35. Differentiate small signal model with large signal model.
36.What are the factors that contribute to the delay time when the transistor is used as a switch?
37. Explain the operation of Power transistor.
38. Draw and explain the input and output characteristics of a transistor in CB configuration.
39.With neat sketch, explain low frequency and high frequency model of a transistor.
40.Derive the equations for voltage gain, current gain, input impedance and output admittance

for a BJT using low frequency h-parameter model for (a) CE configuration (b) CB configuration and (c) CC configuration.
41. If the common-emitter h –parameters of a transistor are given by hie = 2000 Ω ,hfe = 49, hre = 5.5x10-4 and hoe = 2.5x10-5, find the common base h-parameters of the transistor.
42.What do you mean by cascade the amplifiers?
43.Why does R-C coupling give constant gain over mid frequency range?
44.What is the effect of negative feedback on gain in an amplifier?
45. The voltage gain of an amplifier without feedback is 60dB.It increases to 40dB with feedback. Calculate the feedback factor.
46. Explain the basic principle of operation of RC oscillator.
47. Why are L-C resonant circuits impractical at audio frequencies?
48. What are various types of distortion present in power amplifier? How do you graphically determine the second order harmonic distortion?
49. What is difference between voltage and power amplifier? Discuss a method of determining the total harmonic distortion of power amplifier.
50. Explain two of stages RC coupled amplifier and derive expression for voltage gain and frequency response curve.
51. Derive an expression for the overall gain of voltage series and current series feedback amplifier.
52. What are push-pull amplifiers? Draw a model for 2-transistor in a push-pull arrangement
53. Draw and explain the circuit diagram of single and double tuned amplifier circuit. Also its frequency response.
54. Draw the small signal hybrid π-model at high frequency. Explain each component of this model and Prove that hfe = gm.rb'e.
55. Write short notes on the following :i) Wein Bridge Oscillator
ii) Stagger Tuned Amplifier
iii) High Frequency T-model
56. Differentiate between voltage and power amplifier.
57. What is an oscillator? How does it differ from an amplifier?
58. Define harmonic distortion.
59. What is the main advantage of using Transformer coupling over R-C coupling?
60. Explain the principle of multistage amplifiers.
61. Why is crystal oscillator used in radio transmitter?
62. List all advantages of negative feedback in amplifier.
63.Compare RC phase shift and crystal oscillator
64. Explain the working of Hartley oscillator and derive the expression for its frequency of operation
65. State Barkhausen's Criteria for Oscillation.
66.What are the factors responsible for reduction in gain at high frequencies?
67. Define noise figure for an amplifier.
68. Write the principle of phase shift oscillator.
69. Draw the output waveforms for class A, class B, class AB and class C of power amplifier.
70. Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%.
71. What are the advantages and disadvantages of negative feedback in amplifier? Discuss the current shunt negative feedback amplifier.

72. Draw the circuit diagram of Hartley oscillator using BJT and briefly explain how oscillations are maintained in this oscillator.
73. State and explain Miller's Theorem
74.Why FET is called voltage controlled device.
75. Derive the maximum efficiency of transformer coupled class-A power amplifier. Compare it with the direct coupled class-A power amplifier.