Question Bank:

Q1. Define forward static and dynamic resistances of diode.

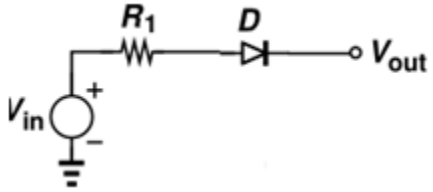
Q2. Draw the V-I characteristics of PN junction Diode.
Q3. Write down the expression for Diode Current.
Q4. Write any two differences between Zener breakdown and Avalanche breakdown.
Q5. What is meant by Zener diode?
Q6. Draw the V-I characteristics of Zener diode.
Q7. List the applications of Zener Diode.
Q8. Define the ripple factor for a half-wave and full-wave rectifier.
Q9. Compare the performance of half-wave rectifier and full-wave rectifier.
Q10. Define Transformer utilization factor.
Q11. What are the advantages of Bridge rectifier?

Q12. Define avalanche breakdown and zener breakdown.

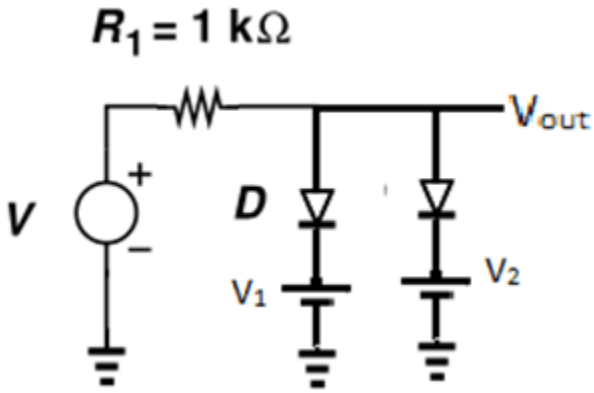
Q13.Explain the operation of forward biased and reverse biased PN junction Diode.
Q14. Derive the diode current equation.

Q15. Explain about the effect of temperature on diode characteristics.

Q16. For a circuit given below, what will be the output if input signal is a sine wave shown below. (Use ideal diode model of diode)



Q17. Describe output V_{out} of the circuit given below?
(The voltage V_1 is 1V, V_2 is 1V and input to the circuit V is 5sint. Assume both diodes are identical. Use constant voltage drop model for diode and take cut-in voltage as 0.7V)



Q18. What is transistor? Give its circuit symbol.

Q19. In a transistor operating in the active region although the collector junction is reverse biased the collector current is quite large. Explain.

Q20. What is reverse saturation current?

Q21. Define α and β.

Q22. Find the relation between α and β.

Q23.List some applications of BJT.

Q24. Define cutoff and active region of a transistor.

Q25. Draw the output characteristics of a transistor in CE configuration.

Q26.Why base made thin in BJT?

Q27. Among CE, CB and CC configurations which is most popular? Why?

Q28. Define Base Width modulation.

Q29.What are the bias conditions of base-emitter and base-collector junction to operate a transistor in cut off region?

Q30. Define the current I_{CEO}.

Q31. Explain why $I_{CEO} >> I_{CBO}$

Q32. Why is emitter follower so named?

Q33. I_E=5mA, I_c=4.85mA, I_{CEO}=200uA. Calculate βdc and leakage current $I_{CBO.}$

Q34. What do you understand by h-parameters?

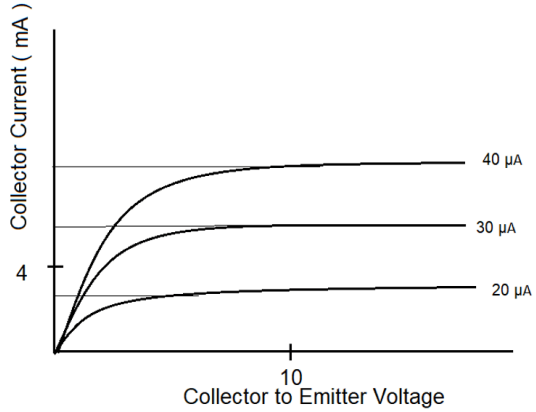
Q35. What is the significance of h-parameters?

Q36. Which factors determine the switching speed of the transistor?

Q37. What are the limitations of switching parameter?

Q38. What is the need for small signal model of BJT?

Q39. . From the figure, what is β_{ac} when V_{CE} is 10V and I_c is 4 mA?



Q40. Derive the expression for A_I, A_V, Ri and Ro for CB amplifier using h-parameter model.

Q41. A CE amplifier is driven by a voltage source of internal resistance Rs = 1000Ω and the load impedance of RC=2kΩ. The h-parameters are hie=1.3k, hfe=55, hoe = 22μA/V and hre = 2 x10-4. Neglecting biasing resistors, compute current gain, voltage gain, input impedance, output impedance for the value of Emitter Resistor RE = 200Ω inserted in the emitter circuit.

Q42. Derive input impedance, output impedance and voltage gain of JFET Common Drain amplifier with neat diagram.

Q43. Draw the circuit diagram of JFET Common Source amplifier with voltage divider bias for bypassed Rs and determine the expression for input impedance, output impedance and voltage gain.

Q44. Why hybrid model is used for the analysis of BJT amplifier at low frequencies?

Q45. Compare the CE, CB and CC transistor amplifier parameters.

Q46.Why is FET is known as unipolar device ?

Q47. Compare Depletion-MOSFET & Enhancement-MOSFET.

Q48. Draw the drain characteristics of JFET & mark the regions of operation.

Q49. Explain with the help of neat diagrams, the structure of an N-channel FET and its Volt-ampere characteristics. In what ways it is different from a bipolar transistor.

Q50. Describe the construction and explain the operation of depletion mode MOSFET. Also draw the static characteristics.

Q51. What are the features of JFET?
Q52. What is meant by Pinch-off voltage?

Q53. How is drain current controlled in JFET?
Q54. Define amplification factor.

Q55. Write Shockley's equation.
Q56. What are the applications of JFET?
Q57. What are the precautions to be taken when handling MOSFET?

Q58. What are the parameters of JFET?

Q59. Why noise level in FET is smaller than BJT?
Q60. Why the input impedance in FET is very high in comparison with BJT?

Q61. In a n-channel JFET, I_{DSS} = 20 m A and V_P = -6 V. Calculate the drain current when V_{GS} = -3 V.

Q62. Draw and explain the small signal model of common source amplifier.

Q63. Write short notes on threshold voltage and gate capacitance.

Q64. Give the relationship between different JFET parameters?

Q65. Explain the classification of amplifiers.

Q66. Discuss the need of cascading amplifiers.

Q67. Describe different methods used for coupling multistage amplifiers with their frequency response.

Q68. Draw the block diagram of n-stage cascaded amplifier and analyze its various parameters.

Q69. Analyze Two stage RC coupled amplifier with neat diagrams.

Q70.Briefly explain about differential amplifiers.

Q71. With neat diagram explain cascode amplifier and derive the overall voltage gain of cascode amplifier.

Q72. Explain the effect of cascading of amplifiers on bandwidth.

Q73. An amplifier consists of 3 identical stages in cascade, the bandwidth of overall amplifier extends from 20 Hz to 20 kHz. Calculate the bandwidth of individual stage.

Q74. With neat diagram explain Series fed, Directly coupled Class A Power Amplifier and derive its maximum efficiency.

Q75. Describe Higher order harmonic distortion.

Q76. With neat diagram explain Push Pull Class B Power Amplifier and derive its maximum efficiency.

Q77. Describe Complementary Symmetry Class B Power Amplifier with diagram and write about crossover distortion in class B power amplifiers.

Q78. Explain the effect of cascading single tuned amplifiers on bandwidth.

Q79. Write notes on Class AB operation.

Q80. Explain the characteristics of negative feedback amplifiers.

Q81. Discuss the limitations of multistage amplifiers.

Q82. Discuss Feedback topologies.

Q83.An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% due to temperature, find the percentage change in gain of the amplifier with feedback.

Q84. Derive the expressions of input and output resistances for Voltage Series Feedback Amplifier.
Q85. Determine the input and output resistances of Current Shunt feedback amplifier.

Q86. Derive the expressions of input and output resistances for Voltage Shunt feedback amplifier.

Q87. Determine the input and output resistances of Current Series feedback amplifier.

Q88. Distinguish between series and shunt feedback.

Q89. How does a oscillator differ from an amplifier?

Q90. Draw the circuit diagram of a voltage series feedback amplifier and derive expressions for voltage gain with and without feedback.

Q91. Write notes on frequency stability of an oscillator.
Q92. A negative feedback of $\beta = 0.01$ is applied to an amplifier of gain 500. Calculate the change in overall gain of the feedback amplifier if the internal amplifier is subjected to a gain reduction of 10 %.

Q93. What is Gain Margin?

Q94. What do you understand by Noise Margin?

Q95. What is an oscillator?
Q96. What are sustained oscillations?
Q97. What is Piezo electric effect?

Q98. What are the different types of feedback depending in the type of feedback signal?
Q99. Define Barkhausen criterion.

Q100. Mention the expression for frequency of oscillation for a hartley oscillator.
Q101. Mention two reasons why LC oscillator is preferred over RC oscillator at radio frequency.

Q102. What is sustained oscillation?
Q103. What are the essential parts of an oscillator?

Q104. Explain the working of Colpitt's oscillator and derive an expression for frequency of oscillation for Colpitt's oscillator.

Q105.Write short notes on LC oscillator.

Q106.Write short notes on crystal oscillator.