# QUESTION BANK

## Subject- Electronic Devices

## Subject Code: BTEC- 301-18

1. Define Doping.
2. What do you understand by extrinsic semiconductor?
3. What are the two types of extrinsic semiconductors?
4. What is meant by unbiased PN junction?
5. What is meant by depletion layer in unbiased PN junction?
6. Define forward static and dynamic resistances of diode.
7. Define diffusion capacitance and transition capacitance.
8. Draw the V-I characteristics of PN junction Diode.
9. Write down the expression for Diode Current.
10. Write any two differences between Zener breakdown and Avalanche breakdown.
11. Draw the V-I characteristics of Zener diode.
12. List the applications of Zener Diode.
13. Define the ripple factor for a half-wave and full-wave rectifier.
14. Compare the performance of half-wave rectifier and full-wave rectifier.
15. What are the advantages of Bridge rectifier?
16. Compare the rectifier and regulator.
17. What is meant by LED? What materials are used to construct an LED?
18. Define the following for LED

a) Radiant intensity
b) Irradiance

19. Write the diffusion current expression and state how this current is formed?
20. Write the temperature dependence of reverse saturation current of PN junction diode.
21. Draw the energy band diagram of a semiconductor.
22. Why an LC filter is called load independent?
23. Draw the equivalent circuit of zener diode under proper biased condition.
24. Why a semiconductor acts as an insulator at ordinary temperature?
25. Define valence band and conductance band.
26. Name some donor and acceptor which can be added as impurities in Silicon and Germanium.
27. Why Silicon is preferred over Germanium in the manufacture of semiconductor devices?
28. Define forbidden energy gap.
29. Define forward and reverse recovery time of a diode.
30. Define knee voltage and breakdown voltage with respect to diode.
31. Define avalanche breakdown and zener breakdown.
32. Define peak inverse voltage of diode.
33. Define load regulation and line regulation.
34. What are the limitations of using zener diode regulator?
35. What are the types of filter?
36. In a transistor operating in the active region although the collector junction is reverse biased the collector current is quite large. Explain.
37. What is reverse saturation current?
38. Define $\alpha$ and $\beta$.
39. Define the various h-parameters in a transistor.
40. List some applications of BJT.

41. Define cutoff and active region of a transistor.
42. Draw the output characteristics of a transistor in CE configuration.
43. Describe how amplification and switching achieved by a BJT?
44. What are the bias conditions of base-emitter and base-collector junction to operate a transistor in cut off region?
45. Define the current ICEO.
46. Why is emitter follower so named?
47. Draw the ebers-moll model of CE transistor circuit.
48. What are the features of JFET?
49. What is meant by Pinch-off voltage?
50. Define amplification factor.
51. Draw the symbol of JFET.
52. Define drain resistance and Transconductance.
53. Write Shockley's equation.
54. Define threshold voltage of a MOSFET.
55. Why noise level in FET is smaller than BJT?
56. Why the input impedance in FET is very high in comparison with BJT?
57. Why is FET preferred as a Buffer Amplifier?
58. What are the different types of MOSFET?
59. What is the major difference in construction of the D-MOSFET and the E-MOSFET?
60. What are the applications of MOSFET?
61. What is meant by cascade connection?
62. What is meant by cascode connection?
63. Among CE, CB and CC configurations which is most popular? Why?
64. Why base made thin in BJT?
65. Describe how amplification and switching achieved by a BJT?
66. Explain the operation of forward biased and reverse biased PN junction Diode.
67. (i) Explain the current components in a PN junction diode.
(ii) Derive the diode current equation.
68. Explain the working of Bridge rectifier. Give the expressions for RMS current, PIV, ripple factor and efficiency.
69. Describe the working principle of full wave rectifier and derive the expressions for the ripple factor, efficiency, $V_{DC}$ , $I_{RMS}$, $I_{Lmax}$ and $V_{RMS}$.
70. Draw the block diagram of series and shunt voltage regulator and explain the operation of series & shunt voltage regulator.
71. (i) Briefly explain the operation of multiple LC filter.
(ii) Explain the operation of $\pi$ section filter with bridge rectifier and also derive an expression for its stability factor.
72. Draw and explain the input and output characteristics of a transistor in CE configuration.
73. (i) Explain the operation of Power transistor.
(ii) Describe two applications of BJT.
74. Draw and explain the input and output characteristics of a transistor in CB configuration.
75. Explain the working of NPN and PNP transistor.
76. With necessary circuit and waveform, explain the switching characteristics of a transistor in detail.
77. (i) Distinguish between the different types of transistor configurations with necessary circuit diagrams.
(ii) With neat sketch, explain low frequency and high frequency model of a transistor.
78. Draw and explain the input and output characteristics of a transistor in CC configuration.
79. Derive the expression for AI, AV, Ri and Ro for CB amplifier using h-parameter model.
80. 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.
81. 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.
82. Describe the construction and explain the operation of depletion mode MOSFET. Also draw the static characteristics.
83. Explain the working of a P channel JFET and draw the V-I characteristics of it.
84.Compare N-with P-channel MOSFETS.
85. Compare P-channel JFET with N-channel JFET.
86. Compare JFET and MOSFET?
87. Draw and explain the small signal model of common drain amplifier
88. Describe the kind of operation that takes place in the enhancement mode MOSFET. How does this differ from depletion mode type?
89. Draw and explain the small signal model of common source amplifier.
90. Explain the performance of FET as a voltage variable resistor.
91. Obtain low frequency and high frequency model for FET.
92. With neat diagram, explain the working of Darlington connection.
93. Draw and explain the small signal model of common gate amplifier.
94. Write short notes on threshold voltage and gate capacitance.
95. Discuss all the steps involved in fabrication of CMOS.
96. Define and explain the three parameters of a JFET give the relation between them.
97. What is etching. Explain its different types and state advantages and demerits of each.
98. What do you mean by anneaing.Why it is required in IC fabrication process.
99. What is sheet resistance.
100.What is a solar Cell and how does it work.