

Question Bank

Class: IV Sem B.Tech. (EEE)

Subject: Analog and Digital electronics

1. Differentiate between combinational and sequential circuit.
2. Differentiate between digital and analog electronics.
3. Write short notes on
4. a) latch b) Flip flop c) counter d) Register
5. Differentiate between Mux and Demux.
6. what is decoder?
7. What do you mean by encoder?
8. Write the short notes on Shift register, universal shift register, Bidirectional shift register.
9. What is multiplexer? Draw the logic diagram of 8 to 1 line multiplexer
10. Implement the switching function $F = (0,1,3,4,7)$ using a 4X1 MUX .
11. Derive the characteristic equation of D flip flop
12. Distinguish between combinational and sequential logic circuits
13. What are the various types of triggering of flip-flops?
14. Derive the characteristic equation of a T flip flop
15. Derive the characteristic equation of a SR flip flop
16. What is race round condition? How it is avoided?
17. Define Master slave flip flop.
18. Why 'T' FF and 'D' FF called as toggle and delay flip flop?
19. Explain different types of Counters.
20. What is the primary disadvantage of an asynchronous counter?
21. How synchronous counters differ from asynchronous counters?
22. Write a short note on counter applications
23. Draw an asynchronous 4 bit up-down counter and explain its working
24. Explain the operation of JK FF.

25. Draw the diagram of a JK flip-flop and D flip-flop and derive various tables.
26. Design and explain the working of a synchronous mod – 3 counter
27. Design and explain the working of a synchronous mod – 7 counter
28. What are the advantages of shift registers?
29. What are the applications of a shift register?
30. How many flip-flops are needed to build an 8 bit shift register?
31. List the basic types of shift registers in terms of data movement.
32. Design a BCD or MOD -10 or decade synchronous counter.
33. Implement $ABC+BCD+ACD$ using 8X1 MUX.
34. Implement 3 bit up/down synchronous counter.
35. Explain edge triggered flip flops.
36. Explain ring counter with suitable diagram.
37. Explain Johnson counter with suitable diagram.
38. Convert RS flip flop to JK flip flop.
39. Convert JK flip flop to T flip flop.
40. Implement full adder as decoder.
41. Implement 3 bit down synchronous counter.
42. Implement 3 bit up/down asynchronous counter.
43. Implement 3 bit asynchronous counter.
44. What is an oscillator?
45. What are sustained oscillations?
46. What is Piezo electric effect?
47. Why quartz crystal is commonly used in crystal oscillator?
48. Why is an RC phase shift oscillator called so?
49. Name three high frequency oscillators.
50. Distinguish between LC and RC oscillator.
51. Name two low frequency oscillators.

52. What are the advantages of crystal oscillator?
53. Define Barkhausen criterion.
54. Distinguish between positive and negative feedback.
55. How does an Oscillator differ from an amplifier?
56. Mention the expression for frequency of oscillation for a Hartley oscillator.
57. Mention two reasons why LC oscillator is preferred over RC oscillator at radio frequency.
58. What are the advantages of positive feedback?
59. What are the essential parts of an oscillator?
60. With a neat sketch explain the working of an RC phase shift oscillator and derive an expression for frequency of oscillation for an RC phase shift oscillator.
61. Explain the working of Colpitt's oscillator and derive an expression for frequency of oscillation for Colpitt's oscillator.
62. (i) Write short notes on LC oscillator. (ii) Write short notes on crystal oscillator.
63. Write notes on frequency stability of an oscillator.
64. 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%.
65. Write notes on Wien bridge oscillator and calculate the frequency of oscillations and condition of oscillation.
66. Explain the operation of Hartley oscillator along with suitable diagram and derivation.
67. Why is negative feedback employed in high gain amplifiers?
68. What is feedback ?
69. What are the different types of feedback depending on the type of feedback signal?
70. Determine the voltage gain of the negative feedback amplifier whose open loop gain is -150 and 7% of the output is feedback
71. Draw the circuit diagram of a current series feedback amplifier and derive expressions for voltage gain with and without feedback.
72. Briefly analyse the performance measures of negative feedback amplifiers.

73. Explain in detail about the different feedback topologies.
74. Draw the circuit diagram of voltage series feedback amplifier and derive expressions for voltage gain with and without feedback.
75. An amplifier has a voltage gain of 50 dB with an negative feedback and with a feedback ratio of $1/10$. Calculate the gain with feedback. (b) The voltage gain of an amplifier without feedback is 50 dB. If it is reduced to 30 dB with feedback, calculate the feedback factor.
76. What are the different feedback topologies?
77. What are the effects of negative feedback?
78. Distinguish between series and shunt feedback.
79. Define desensitivity factor.
80. What are the advantages of negative feedback.
81. Explain low and high frequency response of common emitter amplifier.
82. Explain low and high frequency response of common source amplifier.
83. Differentiate between negative feedback and positive feedback.
84. Discuss the switching characteristics of a transistor for a pulse input.
85. Explain the working of a 4 bit weighted Register D/A Converter with a neat diagram.
86. Explain with a neat diagram, the Dual slope A/D converter.
89. Explain the working of a Comparator using op-amp.
90. With a neat diagram and Waveforms, explain Zero Crossing detector using op. amp.
91. Explain a monostable Multivibrator using 555 IC.
92. State difference between static and dynamic memory.
93. Differentiate between astable and monostable multivibrator.
94. Explain the working of a Decade counter with a neat diagram and waveforms.

95. Explain with a neat diagram serial in serial out 4 bit shift register.
96. Explain the working of a 4 bit weighted Register D/A Converter with a neat diagram.
97. Explain with a neat diagram, the Dual slope A/D converter.
98. Explain CE configuration of BJT with i/p and o/p characteristics.
99. Explain CB configuration of BJT with i/p and o/p characteristics.
100. Compare the CB, CC, CE configuration with application.
101. Explain transistor as a switch .
102. What is a single tuned amplifier?
103. What are the disadvantages of tuned amplifiers?
104. What is feed back?
105. What are feed back amplifiers?
106. What are the types of feed back? 8. What is negative feed back?
107. What is positive feedback?
108. Which feedback increases the gain of the amplifier?
109. State Barkhausen criterion.
110. Give the classification of oscillators.
111. Define feedback factor .
112. Draw the schematic representation of Hartley oscillator.
113. In Hartley oscillator calculate L_2 if $L_1 = 15\text{mH}$, $C = 50\text{pF}$ mutual inductance of $5\mu\text{H}$ and frequency of oscillations is 168 KHz.
114. Compare the frequency response characteristics of an amplifier with and without Feedback.
115. What is the condition for the sustained oscillation?
116. Draw and explain the working of colpitt oscillator.
117. Why is RC –phase shift oscillator is preferred for the generation of low frequency ? Derive the frequency of oscillation for the same.
118. Explain in detail(i) Voltage-shunt feedback amplifier(ii) current – series feedback amplifier.
119. Give the circuit diagram of a non inverting schmitt trigger and derive the expression for hysteresis voltage.
120. Explain the operation of a astable multivibrator ckt. using an opamp. also derive expression for cut off frequency.
121. Explain the operation of a monostable multivibrator ckt. using an 555 timer.

122. Distinguish between A/D and D/A converter.
123. Explain the operation of any D/A converter ckt. .
124. Explain the operation of any A/D converter ckt. .
125. Give the diagram of a sample and hold circuit and explain its operation.
126. Explain the procedure for obtaining a 32 X 4 memory chips along with circuit diagram.
127. Explain the operation of LED along with type of material used, applications, advantages and disadvantages.
128. Explain the operation of varactor diode along with type of material used, applications, characteristics, advantages and disadvantages.
129. Explain the operation of tunnel diode along with type of material used, applications, forward and reverse characteristics, advantages and disadvantages.
130. Explain the operation of photo detector.
131. Explain the responsivity, quantum efficiency, directivity and dark current in case of photo detector.
132. Explain the operation of schottky diode along with type of material used, applications, characteristics, advantages and disadvantages.
133. Explain different types of A/D converter.
134. Explain different types of D/A converter.
135. Explain Successive approximation along with suitable diagram and working.
136. Explain Dual slope along with suitable diagram and working.
137. Explain the block diagram of regulated power supply.
138. Explain the block diagram of shunt regulated power supply.
139. Explain the block diagram of series regulated power supply.
140. Explain the advantages of semiconductor memory.
141. Differentiate between SRAM and DRAM.
142. Differentiate between RAM and ROM.
143. Differentiate between PROM and EPROM.
144. Explain the working of SRAM .
145. Explain the organization of ROM.

146.Explain the organization of RAM.

147.Differentiate between PHASE SHIFT and WEIN BRIDGE oscillator.

148.Explain the operation of phase shift oscillator using FET along with suitable diagram and derivation.

149.Explain the operation of phase shift oscillator using BJT along with suitable diagram and derivation.

150.Differentiate between R/2R ladder and weighted resistor.

