

Electrical Engineering

ANALOG ELECTRONIC CIRCUITS (EE)

1. Sketch a combinational clipper circuit. Explain its working.
2. Explain the drain characteristics of JFET and mark the pinch-off voltage.
3. Differentiate between positive and negative feedback. Explain how does the negative feedback modify the gain of an amplifier.
4. Explain the Barkhausen Criteria of oscillations.
5. What is a zero-crossing detector?
6. An inverting amplifier using the 741 IC must have a flat response up to 40KHZ. The gain of the amplifier is 10. What maximum peak to peak input signal can be applied without distorting the output?
7. Explain the operation of a triangular wave generator.
8. Design a phase shift oscillator so that $f_a \sim 200$ Hz.
9. a) What factors are to be considered for selecting the operating point Q for an amplifier?
b. Draw a voltage divider bias circuit and derive the equations of voltage and current at input and output terminals.
10. a. Derive the equation for voltage gain and current gain for a BJT using approximate h- parameter model for Common Emitter configuration.
b. A CE amplifier has the h-parameters given by $h_{ie} = 1000/\Omega$, $h_{re} = 2 \times 10^{-4}$, $h_{fe} = 50$, $h_{oe} \sim 25/\Omega$. If both the load and source resistances are $1k \Omega$, determine the (a) current gain and (b) voltage gain.
11. How does the constructional feature of a MOSFET differ from that of a JFET?
12. Draw the circuit of a Two Stage RC- Coupled amplifier and explain its working and advantages.
13. Derive the equation for power output and conversion efficiency of a class A series fed amplifier.
14. Write short notes on the following:
 - a. CMRR
 - b. Slew rate

- c. Common mode gain
 - d. Differential mode gain
15. Draw the inverting and non-inverting amplifier circuits of an OP-AMP in closed - loop configuration. Obtain the expressions for the closed loop gain in these circuits.
 16. With the help of internal functional diagram, explain how a monostable multivibrator works with use of 555 timer.
 17. Draw the circuit of a Halfwave Precision Rectifier circuit and explain its operation.