

SMALL SIGNAL AMPLIFIERS

1. What do you understand by single stage transistor amplifiers? Explain with the help of output characteristics how the variations in base current affect collector current variations. Assume the base current variations are sinusoidal.
2. Analyse a two port network with the help of a black box. Hence obtain h – *parameters* for it.
3. Draw the h – parameter equivalent circuit for a BJT, simplify it to transconductance model. Obtain an expression for voltage gain.
4. Draw the circuit diagram and transconductance equivalent circuit of a CE amplifier. Obtain expressions for its voltage gain, current gain and power gain.
5. Draw the circuit diagram and transconductance equivalent circuit of a CB amplifier. Obtain expressions for its voltage gain, current gain and input resistance.
6. Draw the circuit diagram and transconductance equivalent circuit of an emitter follower amplifier. Obtain expressions for its input resistance and output resistance.
7. Draw the circuit diagram and transconductance equivalent circuit of a common source amplifier. Obtain expressions for its voltage gain.
8. Draw the circuit diagram and transconductance equivalent circuit of a source follower amplifier. Obtain expressions for its voltage gain and output resistance.

FEEDBACK AMPLIFIERS

1. What do you understand by feedback? Why is negative feedback applied in high gain amplifiers?

2. Discuss the principle of negative voltage feedback in amplifiers with a neat diagram.
3. Drive an expression for the gain of negative voltage feedback amplifier.
4. What is a feedback circuit? Explain how it provides feedback in amplifiers.
5. Describe the action of emitter follower with neat circuit diagram.
6. Derive expressions for (i) voltage gain (ii) input resistance and (iii) output resistance of an emitter follower.
7. Explain the effect of negative feedback on bandwidth
8. Explain how negative feedback in an amplifier helps in reducing the distortion.
9. Explain how negative feedback in an amplifier helps in stabilizing the gain.
10. Explain how negative feedback in an amplifier helps in reducing the output resistance and increasing the bandwidth.
11. Draw the circuit diagram of a voltage – series feedback amplifier and obtain expressions for voltage gain with feedback and without feedback.
12. Draw the circuit diagram of a voltage – shunt feedback amplifier and obtain expressions for voltage gain with feedback and without feedback.
13. Draw the circuit diagram of a current – series feedback amplifier and obtain expressions for voltage gain with feedback and without feedback.

MULTISTAGE AMPLIFIERS

1. What do you understand by multistage transistor amplifiers? Discuss its need.
2. Explain the following terms:
 - (i) Frequency response
 - (ii) Decibel gain
 - (iii) Bandwidth

3. Explain transistorised RC coupled amplifier with neat circuit diagram. Explain its advantages and disadvantages. Give its applications.
4. With neat circuit diagram explain the working of transformer coupled transistor amplifier.
5. Explain how you will achieve impedance matching with transformer coupling.
6. Explain direct coupled transistor amplifier.
7. Explain working of Cascade amplifier and analyse the same to calculate A_v , R_i and R_o .
8. With the help of neat circuit diagram explain the working of a differential amplifier.

POWER AMPLIFIERS

1. What is an audio power amplifier? What is its need?
2. Explain the difference between a voltage and a power amplifier.
3. What do you understand by class A, class B and Class C power amplifier?
4. Define and explain the following terms as applied to power amplifiers?
 - (i) Collector efficiency
 - (ii) Distortion
 - (iii) Power dissipation capability.
5. Show that maximum collector efficiency of class A transformer coupled power amplifier is 50%.
6. Draw the block diagram of a practical power amplifier and explain it.
7. Explain the push – pull circuit with a neat diagram?
8. Write short notes on the following:
 - A. Heat sink.
 - B. Driver stage
9. Write short notes on the following:
 - A. Output stage
 - B. complementary – symmetry amplifier