

ELECTRONICS AND SOLID STATE DEVICES

Paper-II : Semester-VI

Time Allowed : Three Hours

Maximum Marks : 40

Note : The candidates are required to attempt two questions each from Section A and B carrying 8 marks each and the entire Section C consisting of 8 short answer type questions carrying 1 marks each.

SECTION-A

1. Draw the low frequency h-parameters equivalent circuit of common emitter transistor amplifier and derive expressions for current gain, voltage gain, power gain, input resistance and output resistance. 8
2. What do you understand by feedback in an amplifier ? Derive an expression for voltage gain of an amplifier with series-voltage feedback. What are advantages of negative feedback ? 8
3. Derive an expression for the voltage gain of a common source amplifier with help of a labelled circuit diagram. 8
4. (a) The overall gain of an amplifier is 150. When negative feedback is applied, the gain reduces to 15. Find the fraction of the output that is feedback to the amplifier. 4
(b) What are h-parameters ? Give the methods of obtaining h-parameters in CE configuration of the transistor. 4

SECTION-B

5. State Barkhausen criterion for sustained Oscillations. Draw the labelled circuit diagram for a Colpitt's oscillator and explain its working.
6. What do you understand by Modulation ? Derive an expression for total power in an amplitude modulated wave in term of the unmodulated carrier power and the modulation index. 8
7. (a) What are different ways by which a radio wave may travel from a transmitting to receiving Antenna ? Explain each. 4
(b) Draw a block diagram of AM radio telephone transmission and explain the function of each block. 4
8. (a) The maximum peak-to-peak voltage of an AM wave is 12 mV and minimum peak-to-peak is 6mV. Calculate (i) the percentage modulation, (ii) the amplitude of the unmodulated carrier wave. 5
(b) Give three differences between a oscillator and an amplifier. 3

SECTION-C

9. Attempt all parts :

- (i) Give the meaning of noise signal.
- (ii) Explain tank circuit.
- (iii) Explain the terms distortion in amplifier.
- (iv) Explain demodulation.
- (v) What do you understand by a equivalent circuit ?
- (vi) What are audio frequency amplifiers ?
- (vii) What is a emitter follower ?
- (viii) What is Ionosphere ?

8×1=8