Roll No. ..... Total Pages : 3

BT-3/D-18 **33006**

ANALOG COMMUNICATION

Paper-ECE-203(E)

Opt : II

Time : Three Hours] [Maximum Marks : 100

Note : There are total *eight* questions. Attempt *five* questions in all, selecting *one* question from each unit. Each question carries equal marks.

UNIT–I

1. (a) Determine expression for noise figure of cascaded amplifier and write final expression for multistage amplifier. (10)

(b) An amplifier operating over the frequency range of 455 to 460 kHz has a 200 kΩ input resistor. What is the rms noise voltage at the input to this amplifier if ambient temperature is 27°C. (5)

(c) Give classification of external noise. (5)

2. (a) Determine the Noise equivalent bandwidth of RC low pass filter whose frequency response is given by:

$$H(f) = \frac{1}{1 + j2\pi f RC}.$$ (10)

(b) Explain noise temperature in detail. (10)

UNIT–II

3. (a) Define modulation. What is the need for modulation? Derive an expression for instantaneous voltage of amplitude modulated signal. (10)

   (b) Discuss the third methods for SSB modulation. (10)

4. (a) With the help of a diagram explain principle of envelope detection used for the demodulation of AM signals. Also derive the expression for the time constant of envelope detector. (10)

   (b) Explain with the help of waveform vestigial sideband modulation. Give its advantages. (10)

UNIT–III

5. (a) Define modulation index for a FM system and show how it effects the spectrum of FM signal. (10)

   (b) Describe the reactance modulation method of FM generation. How is frequency stability obtained in this method? (10)

6. (a) Draw the circuit diagram of a radio detector and explain its operation. How is amplitude limiting obtained in this detector? (10)

   (b) Explain the effect of noise on carrier signal in FM. (10)

UNIT–IV

7. (a) Explain the working of a radio transmitter using low power level modulation system. (10)

   (b) Explain radio telephone transmitter, highlighting its special features like volume compressors, VODAS and privacy devices. (10)

8. (a) Write note on AM super heterodyne receiver. (10)

   (b) What is image frequency problem related with super heterodyne receiver and how it can be removed? Elaborate. (10)

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