BT-3/D11   7607

Analog Communication

Paper : ECE-203E

Time : Three Hours]   [Maximum Marks : 100
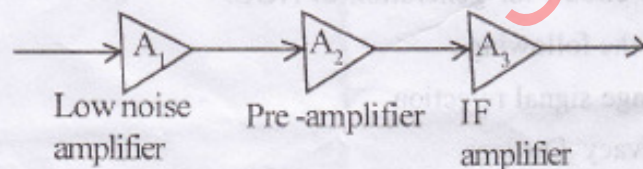
Note :– Attempt any **FIVE** questions by taking at least **one** question from each unit.

UNIT–I

1. (a) The first stage of a two stage amplifier has a voltage gain of 10, a 600 Ω input resistor, a 1600 Ω equivalent noise resistance and a 27 kΩ output resistor. For the second stage, these values are 25, 81 kΩ, 10 kΩ, and 1 MΩ respectively. Find the equivalent input noise resistance.   10

    (b) Derive the expression for noise figure in terms of equivalent noise resistance.   10

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

    $$H(f) = \frac{1}{1 + j\, 2\pi\, f\, RC}.$$ 10

    (b) Obtain the equivalent noise temperature of the system shown :–

    A_1 = 25dB, Te_1 = 4K, A_2 = 17dB, F_2 = 6dB,
    F_3 = 12dB, Room Temperature = 17°C.   10

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 method for SSB modulation.   10

4. (a) Explain with the help of waveforms vestigial sideband modulation. Give its advantages.   10

    (b) Explain the working of square law detector with the help of circuit diagram.   10

UNIT–III

5. (a) Differentiate between :

    (i)   AM and FM signals

    (ii) NBFM and WBFM signals

    (iii) Pre-emphasis and De-emphasis.   15

    (b) Discuss the spectrum of FM signal.   5

6. (a) Explain the working of balanced slope detector. What are its disadvantages ?   10

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

UNIT–IV

7. (a) With the help of block diagram, explain the working of Armstrong FM transmitter.   10

    (b) Explain the concept of AGC and AFC in receivers. Also draw the circuit for generation of AGC.   10

8. Explain the following :-

    (a) Image signal rejection

    (b) Privacy Devices

    (c) Tracking and Alignment of receivers

    (d) Radio broadcast transmitter.   5×4=20