ELTL/CBGS/Ⅴ/Analog Commⁿ. / 13-12-2016

Q.P. Code : 588102

(3 Hours)   [Total Marks : 80

N.B. : (1)   Question **No.1** is **compulsory**.
      (2)   Attempt **any three** questions out of remaining **five**.
      (3)   **Figures** to the **right** indicate **full marks**.
      (4)   Assume suitable **data** if **required** and **mention** the same in **answer sheet**.

1.   Solve **any four** :-   20
    (a)   Justify why FM is more immune to noise.
    (b)   Define noise factor and noise figure.
    (c)   What is Pre-emphasis? Why is it used? Sketch and explain pre-emphasis circuit.
    (d)   What is quantization? Explain types of quantization.
    (e)   Why AGC is required in receivers? Differentiate between simple AGC and Delayed AGC.

2.   (a)   With neat block diagram explain filter method of SSB generation. State   10
        its drawbacks.
    (b)   Explain practical diode detector with delayed AGC.   10

3.   (a)   The antenna current of AM broadcast transmitter modulated to the depth   10
        of 40% by an audio sine wave is 11 Ampere. It increases to 12 Ampere
        as a result of simultaneous modulation by another audio sinewave. What
        is the modulation index due to this second wave?
    (b)   Derive mathematical expression for FM wave and its modulation index.   10

4.   (a)   Explain the operation of Foster seely discriminator with the help of circuit   10
        diagram and phasor diagram.
    (b)   In a broadcast superhetrodyne receiver having no RF amplifier, the loaded   10
        Q of the antenna coupling circuit (at the input to the mixer) is 100.
        (i)   If the intermediate frequency is 455kHz, calculate the image frequency
            and its rejection at 1000kHz and at 25MHz.
        (ii)   In order to make the image frequency rejection of the receiver as good
            at 25MHz as it was at 1000kHz, calculate the loaded Q which an RF
            amplifier for this receiver would have.

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5. (a) State and prove sampling theorem for low pass band limited signal. **10**
   (b) With the help of block diagram and waveform explain generation and **10**
      detection of Pulse Width Modulation.

6. Write short notes on **any four** of the following :- **20**
    (a) ISB Receiver.
    (b) Aliasing error and Aperture effect.
    (c) Slope overload distortion and granular noise.
    (d) Frequency Division Multiplexing (FDM).
    (e) Noise in communication system.

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