Code: 13A04404

R13

B.Tech II Year II Semester (R13) Supplementary Examinations December 2016
ANALOG COMMUNICATION SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

PART – A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a)   Define modulation. Why is modulation required in communication system?
  (b)   Compare TDM and FDM.
  (c)   The carrier swing of a frequency-modulated signal is 70 KHz and the modulating signal is a 7 KHz sine wave. Determine the modulation index of the FM signal.
  (d)   What is Threshold effect in FM?
  (e)   What is meant by thermal noise?
  (f)   Find the figure of merit when the depth of modulation of AM is:
        (i) 100%.   (ii) 50%.
  (g)   State sampling theorem.
  (h)   Compare the sampling techniques of PAM.
  (i)   What is meant by Channel Capacity and Channel efficiency?
  (j)   An event has six possible outcomes with the probabilities P1 = 1/2, P2 = 1/4, P3 = 1/8, P4 = 1/16, P5 = 1/32, P6 = 1/32.Find the entropy of the system and rate of information if there are 16 outcomes per sec.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2   Sketch the circuit diagram of balanced modulator and explain how DSB-SC waveform is generated using any two methods.
OR
3   Answer the following:
  (a)   Quadrature Amplitude modulation.
  (b)   Phase locked loop (PLL).
  (c)   Superheterodyne AM Receiver.

UNIT – II

4   Explain the generation of Narrow band Phase Modulation and Narrow band Frequency Modulation with suitable block diagrams.
OR
5   The equation for a FM wave is $s(t) = 10\sin[5.7 \times 10^8 t + 5\sin 12 \times 10^3 t]$. Calculate: (i) Carrier frequency. (ii) Modulating frequency. (iii) Modulation index. (vi) Frequency deviation. (v) Power dissipated in 100 Ω.

UNIT – III

6   Compare the noise performance of DSB-SC and SSB-SC.
OR
7   Explain the Quadrature representation of narrowband noise along with the envelope of narrowband noise.

UNIT – IV

8   (a)   Give comparison of PAM, PWM and PPM.
    (b)   How to demodulate PPM signal? What are its advantages and disadvantages?
OR
9   List and define the performance parameters of radio receivers in detail.

UNIT – V

10   Discuss Shannon's Encoding algorithm.
OR
11 (a)   Explain Entropy and information rate of markoff sources.
    (b)   Calculate the capacity of a low pass channel with a usable Bandwidth of 3000 Hz and S/N = 10^3 at the channel output. Assume the channel noise to be Gaussian and white.

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