1079
B.E. (Information Technology)
Third Semester
ITE-372/301: Analog and Digital Communication

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

a) A single tone modulating signal $y = \cos(15\pi\ 10^3 t)$ modulates a carrier of 10MHz and produces a frequency deviation of 75 kHz. Find the modulation index.

b) How much power saving is obtained in the transmission of AM-SSB signals?

c) State the Shannon's Theorem.

d) What is the difference between FDD and TDD?

e) What is the meaning of PN code?   (5x2)

UNIT – I

II. a) Define Amplitude Modulation. The rms value of a radio frequency signal is 200 volts before modulation. When it is modulated by a sinusoidal audio frequency signal, its rms voltage value becomes 242 volts. Calculate the modulation index.

b) Explain the principle and working of a Balanced Modulator.   (5,5)

III. a) An FM wave is represented by the voltage equation:
$v = 10 \sin(16\pi \times 10^6\ t + 20 \sin 2\pi \times 10^3 t)$. Find:-

   i)   Carrier frequency

   ii)   Modulating frequency

   iii)   The modulation index

   iv)   Maximum deviation in the FM wave v. Power dissipated of the FM signal

b) What is the relationship between the Frequency and Phase Modulation Systems.
                                                                       (5,5)

IV. a) i)How are PPM signals demodulated?
      ii) For a PAM signal having maximum frequency 3kHz. sampling frequency 8kHz and pulse duration 0.1 Ts, calculate the transmission bandwidth.
   b) What are the limitations of Delta Modulation? How are they overcome?   (5,5)

P.T.O.

UNIT – II

V. a) Differentiate between coherent reception and non coherent detection of FSK signals.

   b) Explain the principle of QAM. Derive the probability of error in QAM signals.
   (5,5)

VI. a) Between the TDM and FDM systems, which system is better and why?

   b) What are the main random access algorithms?
   (5,5)

VII. a) Describe the working of DS-SSMA technique with figures.

   b) What are the commercial applications of SSMA?
   (5,5)

x-x-x