Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards) (Sem.–4)

B.Tech.(ECE)/(ETE) (2011 Onwards)

ANALOG COMMUNICATION SYSTEMS

Subject Code : BTEC-401

Paper ID : [A1189]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Write briefly :

a) Define modulation. Name different types of analog modulation techniques.

b) Derive the relation for Amplitude Modulated (AM) signal including power requirements for transmission. Also draw AM waveforms.

c) What is the bandwidth requirement to pass amplitude modulated signal? Find the bandwidth of AM signal if modulating signal frequency is 4 KHz.

d) What is the frequency range of modulating signals, if one modulates it using

i) AM

ii) FM

e) What are significant sidebands in FM? Explain.

f) Differentiate between product detector and product modulator.

g) Define Sensitivity and fidelity.

h) What is the Nyquist Sampling rate?

i) What is the function of limiter in an FM receiver?

j) What is the difference between TRF and Superhetrodyne radio receiver? Explain.

SECTION-B

2. List out the advantages and disadvantages of SSB.

3. What's significance of Pre-emphasis and De-emphasis? Explain with help of circuit diagram.

4. Draw block diagram of Superhetrodyne radio receiver and explain it in detail.

5. The equation of an angle modulated voltage is

   $v = 20Sin[5 \times 10^8 t + 4Sin1500t]$

   Find

   i) What form of angle modulation is this?

   ii) The carrier and modulating frequencies.

   iii) Modulation index and maximum deviation.

   iv) What power will this voltage dissipate in a 20 ohm resistor?

6. Explain Armstrong method of FM generation with the help of block diagram.

SECTION-C

7. (i) What is Balance modulator? Explain how Balance modulator is used as SSB Demodulator.

   (ii) Describe AM-VSB. Compare ISB (Independent Side band) system to conventional AM system.

8. Write short notes on the following :

   i) PAM modulator circuit

   ii) Noises in communication systems

   iii) PWM

   iv) FM capture effect

9. Define and describe pulse-position modulation, and explain with waveforms how it is derived from PWM.