M.Sc. Physics Examination

Semester - IV

Communication Syatems (Phys-E402)

Paper Code- 4755

Time : 2 Hours 30 min April · 2016 Maximum Marks 70

Notes: Attempt all questions

1. (a)Explain exponential form of Fourier series. How is it used in understanding the signals used in communication systems. What is FFT? [7]
(b) How much bandwidth is required by various analog transmissions? Explain Spectral Density, Energy signals and Power Signals. [7]

OR

1. (a) Write approximate formulas for the Fourier coefficients. Explain the common properties of a general periodic waveform. [7]
(b) Analyze the saw-tooth waveform into its Fourier components. [7]

2. (a) Describe the different types of noise sources in electronic circuits. Write their mathematical equivalents and describe the origin and methods of reducing them. [7]
(b) Calculate the thermal noise power from a 50 ohm resistor at 290K for a bandwidth of 2MHz. What will be its corresponding noise voltage. [7]

OR

2. (a) How is S/N affected when more than one stage of amplifiers is connected in tandem? Derive its equation. [7]
(b)Explain noise factor and derive expression for output noise power. [7]

3. (a) Why is modulation needed? What are the different parameters of carrier which can be modulated? [7]
(b) Derive expression for Amplitude modulated signal. Show its frequency spectrum and explain its energy content in various components. What is the advantage of suppressing carrier? [7]

OR

3. Explain the any one method of generating FM signal using its circuit / block diagram. Give spectrum of a typical FM. How stereo signals are transmitted, explain using spectrum. Explain Foster-Seely discriminator. [14]

4. (a) With a diagram explain doubly balanced diode ring modulator. [7]
(b) With spectrum explain the advantages of Pilot carrier and independent side-band systems. [7]

OR

4. (a) What is the advantage of Pulse Modulation? Describe its different types with their waveforms.. [7]
(b) Explain the Delta modulation system. [7]

5. (a) What is meant by probability of bit error in baseband transmission?Give its expressions for Bipolar and Unipolar binary signals. [7]
(b) With a block diagram explain Amplitude Shift Keying. Discuss its spectra. Why is synchronous modulation preferred? [7]

OR

5. (a) What is Phase Shift Keying? How is BPSK generated and detected explain with a block diagram. [7]
(b) Why is compression needed in signals being modulated? Compare A law and Mu law systems. [7]