[Total No. of Questions - 9] [Total No. of Printed Pages - 3] (2125)

15155

B. Tech 5th Semester Examination

Communication System-II (OS)

EC-5005

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) Attempt any one question form Section A, B, C and D.

(ii) Question No. 9 Section E is compulsory.

SECTION - A

1. (a) Explain the concept of Time Division Multiplexing (TDM) with the help of suitable block diagram (10)

   (b) Describe differential pulse code modulation in detail. (10)

2. (a) Discuss the sampling theorem as applicable to the low pass signal. (12)

   (b) A signal m(t) = $2\cos 6000\pi t + 4\cos 8000\pi t + 6\cos 10000\pi t$ is to be truthfully represented by its samples. What is the minimum sampling rate from

   (i) low pass sampling theorem consideration and

   (ii) band-pass consideration. (8)

SECTION - B

3. Describe in brief frequency shift Keying digital technique with the help of suitable diagrams of transmitter and receiver. (20)

[P.T.O.]

4. What is main advantage of QPSK digital technique ? Describe the mechanism by which a bit stream b(t) generates a QPSK signal for transmission and explain how QPSK signal is demodulated by the receiver. (20)

SECTION - C

5. What is optimum filter? Calculate the probability of error of optimum filter and prove that

$$P_e = \frac{1}{2}\operatorname{erfc}\left[\frac{E_s}{\eta}\right]^{\frac{1}{2}}$$

Where E_s = normalized energy

η = power spectral density. (20)

6. Give different applications of coherent receiver. Explain in detail coherent receiver application in case of Phase shift Keying (PSK) (20)

SECTION - D

7. (a) Describe DSSS communication system in detail. What are the advantages of DSSS system over conventional communication systems. (12)

   (b) Write in brief about processing gain. (8)

8. Write short notes on the following :

   (a) Code division Multiple Access.

   (b) Linear Block Codes. (10×2 =20)

SECTION - E

9. (a) Write in brief about the process of compounding.

   (b) Define Slope-over load error.

   (c) Draw the block diagram of generation of a DPSK signal.

   (d) Give the comparison of BFSK and BPSK.

   (e) Write in brief about Natural PAM.

   (f) Write in brief about frequency HOP spread spectrum.

   (g) Write a short note on MSK.

   (h) A signal band limited to f_m is sampled at Nyquist rate. How the signal can be recovered?

   (i) Explain the term interchannel interference.

   (j) Define sequence length is spread spectrum. (10×2=20)