

SUBJECT CODE:- 321
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(ECT/E&C) Examination Nov/Dec 2015
Digital Communication
(Revised)

[Time: Three Hours]

[Max. Marks: 80]

“Please check whether you have got the right question paper.”

- N.B i) Q.No.1 and Q. No.6 are compulsory.
 ii) Solve any two questions from Q.No.2 to Q.No.5
 iii) Solve any two questions from Q.No.7 to Q.No.10
 iv) Assume suitable data, if necessary.

Section A

- Q.1 Attempt any two questions 10
 a) Define digital communication. How digital communication is better from analog communication.
 b) Derive the equation of ideal sampling with waveform.
 c) What are the advantage & disadvantage of PCM?
 d) Describe interpolation formula.
- Q.2 08
 a) Explain working of PAM with block diagram and waveform. 07
 b) For a PAM of voice signal having maximum frequency equal to $G_m=3\text{KHZ}$, calculate the transmission bandwidth. Given that the sampling frequency $G_s=8\text{KHZ}$ and the pulse duration $T=0.1T_s$. And derive transmission Band width in PAM
- Q.3 08
 a) Derive the expression for natural sampling with waveform and draw the spectrum of natural samples signal. 07
 b) State and prove sampling theorem with three conditions.
- Q.4 07
 a) Classify quantization and derive quantization error $= \frac{\Delta^2}{12}$ 08
 b) A television signal having bandwidth of 4.4MHZ is transmitted using binary PCM system. Given that the number of quantization level is 512. Determine.
 i) Code word length ii) Transmission Bw iii) Find bitrate
 iv) Output signal to noise ratio.
- Q.5 Write short note on 15
 i) PWM
 ii) A law and μ -law companding
 iii) PCM transmitter & receiver

Section-B

- Q.6 Solve any two questions. 10
 i) What is reason to use adaptive delta modulation with waveform?
 ii) How to generate ask signal? Write equation.
 iii) Describe spread spectrum communication system.
 iv) Compare performance of BPSK & DPSK.
- Q.7 07
 a) Define write Gaussian noise. How to use the PDF curve? What is effect of Gaussian noise on bipolar signals? 08
 b) Explain working principle and mathematical expression of delta modulation. 07

- Q.8 a) Describe the scheme to recover the baseband signal in BPSK with the help of a block diagram and signal marked at input, output of these blocks. 08
b) For the input binary sequence $b(k)=\{1, -1, 1, -1, -1, -1, 1, 1\}$ find the transmitted phase sequence and sketch the transmitted waveform for QPSK.
- Q.9 a) Give application of spread spectrum with reference to WLAN, space systems and GPS. 07
b) What is meant by process gain, jam margin, J/S rution and antijam margin? Explain their importance in SS communication system. 08
- Q.10 Write short note on 15
i) ISI and its ideal solution
ii) Discuss MKS systems
iii) Optimum filter