[Total No. of Printed Pages:2] **CODE NO:- Z-83**

FACULTY OF ENGINEERING & TECHNOLOGY

T.E (ECT/E&C) - Year Examination June– 2015

Digital Communication

(Revised)

[Time: Three *Hours*] **[Max. Marks: 80]**

"Please check whether you have got the right question paper."

i) Question. No. 1 & 6 are compulsory.

ii) Solve <u>any two</u> questions from each section from Q.No.2 to 5 and solve any two question from Q.7 to 10

SECTION A

Q.1 Solve <u>any two</u> questions from following 10

a) What is the definition of digital modulation? How digital modulation differences from analog? Distinguish the same with suitable example

b) Draw the block diagram of digital communication system and explain function of each block

c) Explain how aliasing effect occurs and state the removal process of aliasing effect in signal

d) What do you mean by inter symbol interference? How the problem of ISI solved?

Q.2 a) State and prove sampling theorem? Derive necessary formula for proof of sampling theorem 08

b) Explain process of quantization? Explain the pulse code modulation (PCM) technique in brief with necessary wave form 07

Q.3 a) A flat top sampling system samples a signal of maximum 1.2Hz with 2.7Hz sampling frequency. The duration of pulse is 0.21sec. Calculate amplitude distortion due to aperture effect at highest signal frequency 08

b) Draw the block diagram of delta modulation and explain functions of each block. Also state various limitations of delta modulation 07

Q.4 a) Explain the process of companding? Explain 'A 'law' and 'μ' law companding in brief 08

b) What is quantization noise? Derive the expression for signal to quantization noise ratio 07

Q.5 Write short note on following (<u>any three</u>) 15

a) Ideal, natural & flat top sampling

b) b) Adaptive delta modulation

c)Random variables & stochastic process

d)Pulse amplitude, pulse position & pulse width modulation

SECTION B

Q.6 Solve <u>any two</u> questions from following 10

a) Define and explain matched filter. Derive an expression for probability error in the matched filter system

b) Define noise. Classify the different noise & explain any one in detail

c) Explain FSK method

d) Explain slow and fast hopping in FHSS.

Q.7 a) Explain the need of spread spectrum system. What are the different users of S.S. System? 08

b) Compare ASK, PSK,FSK with reference to different parameters 07

Q.8 a) Explain the process of direct sequence spread spectrum? 08

b) How PN sequence relates with spread spectrum? Explain the chip system? 07

Q.9 a) Draw the block diagram of minimum phase shift keying (MSK) & explain the function of each 08

b) Explain in brief about raised cosine spectrum used in digital communication 07

Q.10 Write short note on following (<u>any three</u>) 15

i) QPSK modulation & demodulation

ii) Gaussian noise & its PDF

iii) FHSS technique

iv) Optimum filter