

Roll No.

Total No. of Questions : 09]

[Total No. of Pages : 02

B.Tech. (Sem. - 6th)
DIGITAL COMMUNICATION
SUBJECT CODE : EC - 304
Paper ID : [A0318]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A

Q1)

(10 x 2 = 20)

- a) Differentiate with the help of neat diagram between sampling and quantization.
- b) What is a band limited signal?
- c) Explain the term 'Statistical TDM'.
- d) Explain uniform and non uniform quantization.
- e) Draw the waveforms of an unmodulated carrier, data, ASK, PSK and FSK.
- f) State the disadvantages of DPSK and PSK.
- g) Sketch the QPSK waveform for the sequences 1101010111 assuming the carrier frequency to be equal to the bit rate.
- h) What is a Non-coherent FSK Detector? Discuss briefly.
- i) Explain Fundamentals of time division multiplexing?
- j) Explain Gaussian Minimum Shift Keying.

Section - B

(4 x 5 = 20)

- Q2) Describe with block diagram the working of adaptive delta modulation.
- Q3) Sketch phase state diagram of QPSK modulator.
- Q4) Define FSK Modulation scheme using appropriate block diagram.
- Q5) In a binary PCM system, the output signal-to-quantizing-noise ratio is to be held to a minimum of 40 dB. Determine the number of required levels and find the corresponding output signal-to-quantizing-noise ratio.
- Q6) Compare A-Law and μ -Law.

Section - C

(2 x 10 = 20)

- Q7) (a) Explain how DPCM improves system performance.
(b) Describe Codec and Combo chip.
- Q8) (a) Consider an audio signal comprised of the sinusoidal term:
$$s(t) = 4 \cos 800\pi t$$

(i) Find the signal to quantization noise ratio when this is quantized using 10-bit PCM.
(ii) How many bits of quantization are needed to achieve a signal to quantization noise ratio at least 40 dB.
(b) Discuss the advantages and disadvantages of the following:
(i) TDM.
(ii) DBPSK.
(iii) Alternate mark inversion RZ.
- Q9) (a) Explain how eye pattern are useful for studying inter symbol interference in Digital Communication System.
(b) What is ISI and remedy for ISI?

