

Roll No.

Total No. of Questions : 09]

may 08

[Total No. of Pages : 02

Paper ID [EC304]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 6th/7th)

DIGITAL COMMUNICATION (EC - 304)

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 × 2 = 20)

- a) What are the advantages and disadvantages of digital communication.
- b) What do you mean by companding.
- c) Explain the principle of non-coherent FSK demodulator.
- d) Slope overload problem can be overcome by increasing the step size. Justify it.
- e) State and Explain the sampling theorem.
- f) Draw the ASK spectrum.
- g) Explain the purpose of signaling bit.
- h) What are Guard Bands and when it is used.
- i) Contrast bit and word interleaving.
- j) What is a re-generative repeaters. Why it is used in digital signal transmission.

Section - B

(4 × 5 = 20)

Q2) Explain the principle of continuously variable slope delta modulator.

Q3) Contrast delta modulation PCM and standard PCM.

- Q4)** What is SQR? Explain the relation between SQR, resolution, dynamic range and number of bits in a PCM code.
- Q5)** Explain the relationship between the minimum bandwidth required for a 16-QAM system and the bit rate.
- Q6)** Explain ASK and FSK encoding techniques.

Section - C

(2 × 10 = 20)

- Q7)** A binary PSK signal is applied to a correlator supplied with the phase reference which differs from the exact carrier phase by φ radians. Determine the effect of phase error φ on the average probability of error of the system.
- Q8)** (a) What is a purpose of a clock recovery circuit? When it is used.
(b) Explain the relationship between bits per second and baud for FSK system.
- Q9)** (a) Explain QPSK modulator, demodulator and bandwidth requirement for that.
(b) Determine the bandwidth efficiency for the QPSK modulator and 8-PSK modulator with $F_b = 10\text{Mbps}$.