

4E1330

Roll No. _____

Total No. of Pages: **4****4E1330**

B. Tech. IV - Sem. (Main / Back) Exam., - 2025
Information Technology
4IT3-04 Principle of Communication

Time: 3 Hours**Maximum Marks: 70****Instructions to Candidates:**

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

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1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 What is the main difference between DSBSC and SSB modulation?
- Q.2 State the advantages of CDMA.
- Q.3 What is the purpose of pre-emphasis and de-emphasis in FM systems?
- Q.4 Define aliasing and how it can be prevented.
- Q.5 What is the Nyquist criterion for distortion-free baseband transmission?

- Q.6 What is the role of a matched filter in digital communication systems?
- Q.7 Define processing gain in the context of spread spectrum modulation.
- Q.8 What is the significance of Pseudo-Noise (PN) sequences in DSSS?
- Q.9 State the key difference between PAM and PWM.
- Q.10 Discuss the need for modulation.

PART – B

[5×4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1 Explain the generation and demodulation of a DSBSC signal.
- Q.2 Describe the time and frequency domain representation of an FM signal.
- Q.3 What is Frequency Division Multiplexing (FDM)? Explain its applications.
- Q.4 Derive the sampling theorem and explain its importance in communication systems.
- Q.5 Describe the working of a T1 carrier system.
- Q.6 Explain the generation and detection of QPSK signals.
- Q.7 Discuss the working of a Frequency-Hop Spread Spectrum (FHSS) system.

PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Explain the working of a Phase-Locked Loop (PLL) and its applications in FM demodulation.
- Q.2 Explain the concept of Delta Modulation and Adaptive Delta Modulation (ADM). Compare their performance with PCM.
- Q.3 Discuss the geometric interpretation of signals and orthogonalization in digital modulation. Explain the coherent detection of ASK, PSK and FSK signals.
- Q.4 Describe the raised cosine spectrum and its role in achieving Nyquist's criterion for distortion-free transmission.
- Q.5 Explain the working of Direct Sequence Spread Spectrum (DSSS) with coherent BPSK. Derive the expression for its probability of error.
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