

4E1330

Total No. of Questions : 22

Total No. of Pages : **04**

Roll No. :

4E1330

B.Tech. IV-Sem. (Main/Back) Exam. 2024

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 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)

ersahilkagyan.com

1.

2.

PART-A

[10x2=20]

(Answer should be given up to 25 words only)

All questions are compulsory

Q.1. Define frequency translation.

Q.2. What is Amplitude Modulation (AM)?

Q.3. Differentiate between DSBSC and SSB modulation.

- Q.4. Explain the concept of Frequency Division Multiplexing (FDM).
- Q.5. What is Phase Modulation (PM)?
- Q.6. Describe the role of pre-emphasis and de-emphasis in FM.
- Q.7. State the Sampling Theorem.
- Q.8. What is aliasing in the context of sampling?
- Q.9. Define Pulse Amplitude Modulation (PAM).
- Q.10. Explain the difference between Uniform and Non-uniform quantization.

PART-B

[5x4=20]

(Analytical/Problem solving questions)

Attempt any five questions

- Q.1. Derive the mathematical expression for an AM signal and illustrate its spectrum.
- Q.2. Explain the process of generating and demodulating a DSBSC signal.
- Q.3. Describe the process of ideal sampling and its significance in Communication.
- Q.4. Analyze the error probability in a PCM system and derive the expression for signal to quantization noise ratio.
- Q.5. Illustrate the concept of intersymbol interference (ISI) and its impact on baseband transmission.
- Q.6. Compare the performance of PSK and FSK modulation techniques in terms of bandwidth efficiency and error probability.
- Q.7. Discuss the working of a Direct Sequence Spread Spectrum (DSSS) system with coherent BPSK.

(Descriptive/Analytical/Problem Solving/Design questions)**Attempt any three questions**

- Q.1. Explain the generation and demodulation of SSB signals and compare their bandwidth efficiency with DSBSC and full AM signals.
- Q.2. Describe the process of natural and flat top sampling and their representation in the frequency domain.
- Q.3. What are the different methods of generating FM signals? Explain with suitable diagrams and equations.
- Q.4. Discuss the principles of Delta Modulation and Adaptive Delta Modulation (ADM). How does ADM improve over standard Delta Modulation?
- Q.5. Explain the Nyquist criterion for distortion-free baseband transmission. How does raised cosine filtering help in reducing ISI?

----- x -----