

3 Hours

Max. Marks -- 80

Instructions to candidates

Marks

- 1) Q.No. 1 is compulsory.
- 2) Solve any 3 questions from the remaining 5 questions.
- 3) Figures on the right side indicate full marks.
- 4) Make suitable assumptions where required.

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| Q.No 1 | Answer any four. | |
| | a) What is the significance of AWGN channel ? | 05 |
| | b) Explain Hoffman coding in brief. | 05 |
| | c) Differentiate between FSK and PSK. | 05 |
| | d) Derive the expression for entropy. When is the entropy maximum ? | 05 |
| | e) Explain Correlation receiver . | 05 |
| .No 2 | a) Draw and explain the block diagram of a digital communication system in detail. | 10 |
| | b) State and explain Shannon's theorem. The four symbols produced by a discrete memoryless source has probability 0.5, 0.25, 0.125, and 0.125 respectively. Determine the entropy of the source. | 10 |
| Q.No 3 | a) Find the probability of error of matched filter. comment on your results | 10 |
| | b) With reference to 8-PSK explain the following: (i) transmitter and receiver with a neat block diagram along with mathematical expression for transmitted signal (ii) sketch its PSD indicating the bandwidth (iii) draw its constellation diagram and find its Euclidian distance | 10 |
| Q.No.4 | a) Compare BASK, BFSK & BPSK based on following parameters:- bandwidth requirement, noise immunity, transmission rate, efficiency & applications. | 10 |
| | b) What is ISI ? How is it caused? Discuss the remedies to overcome ISI. state the Nyquist's Condition for zero ISI. | 10 |
| Q.No.5 | a) Why line coding is used ? Draw the various line code formats and state their important properties. | 10 |
| | b) A (7 ,4) cyclic code is generated using the polynomial $x^3+ x + 1$ i) Generate the systematic cyclic code for the data 1100. ii) Draw the encoder & show how parity bits are generated for the data 1100. | 10 |
| Q.No.6 | Write short notes on | |
| | a) Powerline carrier communication | 05 |
| | b) Optical fiber communication | 05 |
| | c) Satellite communication. | 05 |
| | d) Linear Transversal Equalizer | 05 |

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