

Exam.Code:0923
Sub. Code: 6888

1129
B.E. (Information Technology)
Fifth Semester
ITE-545: Principles of Telecommunication

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
 - a) What is Gaussian distribution?
 - b) Define noise temperature.
 - c) Find k and the mean of x, if the random variable x has the following probability distribution
x: -2 -1 0 1
P(x): 0.4 K 0.2 0.3.
 - d) What is meant by transponder?
 - e) Describe the function of core and cladding in optical fibre (5x2)

UNIT - I

- II. a) If each stage has a gain of 10dB and noise figure of 10dB, calculate the overall noise figure of a two stage cascaded amplifier. (5,5)
- b) Explain the concept of short noise (5,5)
- III. Assume that 8 digit binary words are being transmitted over a noisy channel, with a per digit error probability of 0.01. Calculate the probability that 3 digits out of 8 are in error. Also obtain the values of mean and variance for a random variable representing the number of errors. Use binomial distribution. (10)
- IV. Define the term "variance" for the random variable X. Calculate the same if PDF for X is given by:
 $F_x(x) = 1/2e^{-|x|}$ for $-\infty < x < \infty$ (10)

UNIT - II

- V. a) Explain the significance of the entropy H(X/Y) of a communication system where X is the transmitter and Y is the receiver. (5,5)
- b) Explain frequency allocations for satellite services. (5,5)

P.T.O.

(2)

- VI. a) Determine the Huffman code for the following message with their probabilities given

X_1	X_2	X_3	X_4	X_5	X_6	X_7
0.05	0.15	0.2	0.05	0.15	0.3	0.1

- b) Develop Shannon-Fano code for five message given by probabilities $1/2, 1/4, 1/8, 1/16, 1/16$. Calculate the average number of bits/message. (5,5)
- VII. a) Distinguish between step-index and graded-index fibers.
- b) Draw the block diagram of fiber optic communication system and describe the function of each component. (5,5)

x-x-x