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Total Number of Pages : 02

M.TECH

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017
APPLIED PROBABILITY AND STATISTICS
Branch: CS, Subject Code:MCSPC1030
Time: 3 Hours
Max Marks : 70

The figures in the right hand margin indicate marks.

PART-A**(2X10=20 MARKS)****1. Answer the following questions .**

- a) Ten percent of the currency notes received by the cashier of a bank are defective. The notes collected at the end of a day were randomly checked for any defect. What is the probability that at least 5 notes are to be checked in order to get 2 defective?
- b) If X and Y are independent random variable with mean 2,3 and variance 1,2. Find the mean and variance of $Z = 2X - 3Y$.
- c) The joint probability distribution of X and Y is given by $P(x, y) =$ Find the marginal probability distribution of X and Y.
- d) The correlation coefficient of two random variable X and Y is while their variances are 3 and 5. Find the covariance.
- e) What are properties of good estimator?
- f) Write down the normal equations the curve
- g) What is the use of t-test?
- h) Where do you apply z-test?
- i) Write the advantages of MANOVA?
- j) Define co-variance vector?

PART-B**(5 X 10=50 MARKS)**

Answer any five questions from the following.

2. a) Calculate the expected frequencies for the following data pressuring the two attributes viz. conditions of home and conditions of child as independent .

[5]

		condition of home	
		clean	dirty
condition of child	clean	70	50
	fair	80	20
	dirty	35	45

Use test at 5% los to state whether the two attributes are independent.

- b) A random sample of size 100 has mean 15, the population variance

- being 25. Find the interval estimate of the population mean with a confidence level of 99% & 95%. [5]
3. a) Find the MGF of exponential distribution hence find mean and variance? [5]
 b) Find the MGF of gamma distribution hence find mean and variance? [5]
4. a) Define Multivariate Normal Distribution? [2]
 b) Explain about the Multivariate Normal Distribution? [8]
5. a) Define Principal Component Analysis? [2]
 b) Briefly explain about Principal Component Analysis? [8]
6. a) Define Gamma variate. [2]
 b) The daily consumption of milk in a city, in excess of 20,000 gallons, is approximately distributed as a Gamma variate with the parameters $k = 2$ and $\lambda = \frac{1}{10,000}$. The city has a daily stock of 30,000 gallons. What is the probability that the stock is insufficient on a particular day? [8]

7. The following table gives the joint probability distribution of X and Y. Find the:

- a) Marginal density function of X. [5]
 b) Marginal density function of Y. [5]

X \ Y	1	2	3
1	0.1	0.1	0.2
2	2.0	0.3	0.1

8. a) For the following data, find the most likely price at Bhubaneswar corresponding to the price 70 at Rayagada and that at Rayagada corresponding to the price 68 at Bhubaneswar: [8]

	Bhubaneswar	Rayagada
Average price	65	67
S D of price	0.5	3.5

- b) State any two properties of multi variate normal distribution. [2]