JYOTHY INSTITUTE OF TECHNOLOGY

DEPARTMENT OF MATHEMATICS

21MAT41-Complex Analysis, Probability & Statistical Methods

21MATCS41- Mathematical Foundation for Computing, Probability & Statistics

Assignment Common to CSE, ISE, AIML, ECE-A, CIVIL

Module-3

1. Fit a parabola of the form $y = a + bx + cx^2$ to the following data

x	0	1	2	3	4	5
y	1	3	7	13	21	31

2. Obtain the coefficient of correlation for the following data

x	10	14	18	22	26	30
y	18	12	24	6	30	36

3. Ten competitors in a beauty contest are ranked by two judges A and B in the following Calculate the rank correlation coefficient

Id no of competitor	1	2	3	4	5	6	7	8	9	10
Judge A	1	6	5	3	10	2	4	9	7	8
Judge B	6	4	9	8	1	2	3	10	5	7

4. Find the equation of the least fitting straight line $y = ax + b$ for the following data:

x	5	10	15	20	25
y	16	19	23	26	30

5. Find the regression line of y *on* x for the following data. **Estimate the value** of y when x = 10

x	1	2	3	4	5	6	7
y	9	8	10	12	11	13	14

MODULE 4 : PROBABILITY DISTRIBUTION

1. A continuous random variable x has the p. d. f $f(x) = \begin{cases} k x^2 , & 0 \le x \le 3 \\ 0 , & otherwise \end{cases}$

Evaluate k and find (i) $P(x \le 1)$ (ii) $P(1 \le x \le 2)$ (iii) $P(x \le 2)$

2. **A** random variable X take the values $-3, -2, -1, 0, 1, 2, 3$ such that $P(X = 0) = P(X < 0) and\ P(X = -3) = P(X = -1) = P(X = 1) = P(X = 2) = P(X = 3)$ Find the probability distribution
3. Obtain the mean and variance of Binomial distribution
4. Obtain the mean and variance of Poisson distribution
5. An airline knows that 5 percent of the people making reservations on a certain flight will not turn up. Consequently, their policy is to sell 52 tickets for a flight that can only hold 50 passengers. What is the probability that there will be a seat available for every passenger who turns up?
6. The probability that a pen manufactured by a factory br defective is $1/10$. If 12 such pens are manufactured what is the probability that (i) Exactly 2 are defective (ii) atleast 2 are defective (iii) none of them are defective
7. In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation, given that A(0.5) = 0.19 and A(1.4) = 0.42, where A(z) is the area under the standard normal curve from 0 to z > 0

MODULE 5 : JOINT PROBABILITY DISTRIBUTION

8. A fair coin is tossed thrice. The random variables X and Y are defined as follows : X = 0 or 1 according as head or tail occurs on the first; Y= Number of heads. Determine (i) the distribution of X and Y (ii) joint distribution of X and Y.
9. The joint Probability distribution of two random variables X and Y is given below:

x \ Y	-3	-2	4
1	0.1	0.2	0.2
3	0.3	0.1	0.1

Find the (a) Marginal distribution of X and Y (b) CoV(X,Y)

10. The Joint distribution of two random variables X and Y is as follows:

Compute (i) E(X) and E(Y) (ii) E(XY) (iii) Cov (X,Y)

x \ Y	-4	2	7
1	1/8	1/4	1/8
5	1/4	1/8	1/8

11. Ten individuals are chosen at random from a population and their heights in inches are found to be 63, 63, 66, 67, 68, 69, 70, 70, 71, 71 . Test the hypothesis that the mean height of the universe is 66 inches. (Given that $t_{0.05} = 2.262\ for\ 9\ d.f.$)

12. A certain stimulus administered to each of 12 patients resulted in the following change in blood pressure 5, 2, 8, -1, 3, 0, 6, -2, 1, 5, 0, 4 (in appropriate unit). Can it be concluded that, on the whole, the stimulus will change the blood pressure. Use $t_{0.05}(11) = 2.201$.

13. Explain the terms:(i)Null hypothesis (ii)Confidence intervals (iii)Type I and TypeII

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"Those who have Knowledge don't predict,Those who Predict don't have Knowledge"