MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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MLRS

II B.Tech I Sem Supplementary Examination, July-2022
Probability and Statistics
(CIVIL)

Time: 3 Hours.

Max. Marks: 70

Note: 1. Answer any FIVE questions.
       2. Each question carries 14 marks and may have a, b as sub questions.

1. a) The probability that Nirmal will solve a problem is 2/3 and the probability that Satyajit will solve it is 3/4 . What is the probability that (a) the problem will be solved (b) neither can solve it   7M   CO1   U

   b) The probability density function of a continuous random variable is given by $f(x) = kx(2-x), 0 \le x \le 2$. Find the value of k, mean and variance of x.   7M   CO1   Ap

2. Three urns contain 6 red, 4 black; 4 red, 6 black; 5 red, 5 black balls respectively. One of the urns is selected at random and a ball is drawn from it. If the ball drawn is red find the probability that it is drawn from the first urn.   14M   CO1   Ap

3. Fit a Poisson distribution to the following data.   14M   CO2   Ap

X	0	1	2	3	4
f	419	352	154	56	19

4. Fit a binomial distribution to the following: 14M   CO2   Ap

x	0	1	2	3	4	5
frequency	6	13	25	22	21	13

5. Assuming that the average life span of computers produced by a certain company is 2040 hours with standard deviation of 60 hours. Find the expected number of computers whose life span is   14M   CO3   Ap
   (a) more than 2150 hours
   (b) less than 1950 hours
   (c) more than 1920 hours and less than 2160 hours
   from a lot size of 5000 computers

6. a) Fit a straight line $y=a+bx$ to the following data   7M   CO4   U

x	0	1	2	3	4
y	1.0	2.9	4.8	6.7	8.6

   b) Find the curve of best fit of the type $y = ax^b$ to the following data by the method of least squares   7M   CO4   Ap

x	1	2	3	4	5
y	0.5	2.0	4.5	8.0	12.5

7 a) Obtain the rank correlation coefficient for the data following.   7M   CO4   U

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

   b) The two regression equations of the variables x and y are   7M   CO4   Ap
   $x = 19.13 - 0.87y$ and $y = 11.64 - 0.50x$ find the mean of x's, the
   mean of y's, and the correlation coefficient.

8   A manufacturer intends that his electric bulbs have a life of 1000   14M   CO5   Ap
       hours. He tests a sample of 20 bulbs, drawn at random from a batch
       and discovers that the mean life of the sample bulbs is 990 hours
       with a s.d of 22 hours. Does this signify that the batch is not up to
       the standard?

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