



II B.Tech I Sem Supplementary Examination, February-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) A problem of statistics is given to three students A, B and C whose chances of solving it are $1/2$, $3/4$ and $1/4$ respectively. What is the probability that the problem will be solved? 7M CO1 U
- b) Find the mean of the following discrete random variable X, whose distribution function is 7M CO1 Ap
- | | | | | | |
|------|-------|-------|-------|-------|-------|
| X | 0 | 1 | 2 | 3 | 4 |
| P(X) | $1/8$ | $3/8$ | $1/8$ | $2/8$ | $1/8$ |
- 2 An urn I contains 3 white and 4 red balls and an urn II contains 5 white and 6 red balls. One ball is drawn at random from one of the urns and is found to be white. Find the probability that it was drawn from urn I. 14M CO1 Ap
- 3 Fit a binomial distribution to the following: 14M CO2 Ap
- | | | | | | | |
|-----------|---|----|----|----|----|---|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| frequency | 5 | 16 | 28 | 12 | 10 | 4 |
- 4 Fit a Poisson distribution to the following: 14M CO2 Ap
- | | | | | | |
|-----------|----|----|----|---|---|
| x | 0 | 1 | 2 | 3 | 4 |
| frequency | 46 | 38 | 22 | 9 | 1 |
- 5 In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5. Assuming the distribution to be normal, find (i) how many students score between 12 and 15? (ii) how many score above 18? (iii) how many score below 8? (iv) how many score 16? 14M CO3 Ap
- 6 a) Fit a second degree parabola to the following data 7M CO4 U
- | | | | | | |
|---|---|-----|-----|-----|-----|
| x | 0 | 1 | 2 | 3 | 4 |
| y | 1 | 1.8 | 1.3 | 2.5 | 6.3 |
- b) Find the curve of best fit of the type $y = ae^{bx}$ to the following data by the method of least squares 7M CO4 Ap
- | | | | | | |
|---|----|----|----|----|----|
| x | 1 | 5 | 7 | 9 | 12 |
| y | 10 | 15 | 12 | 15 | 21 |

7 a) Find correlation coefficient for the following data:

x	12	10	14	11	12	9	10
y	18	17	23	19	20	19	13

7M CO4 U

b) The following regression equations were obtained from a correlation table: $x = -0.4y + 6.4$ and $y = -0.6x + 4.6$. Find the value of (a) the correlation coefficient, (b) the mean of x's and (c) the mean of y's

7M CO4 Ap

8 A machine which produces mica insulating washers for use in electric device to turn out washers having a thickness of 10 mm. A sample of 10 washers has an average thickness 9.52 mm with a standard deviation of 0.6 mm. Find out t.

14M CO5 Ap

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