Hall Ticket Number :										

R-17

Code: 7GC42

II B.Tech. II Semester Supplementary Examinations May / June 2024

Probability and Statistics

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) State and prove Addition theorem on probability for two events. 8M

   b) If two dice are throw , Find the probability of getting a sum is10 6M

OR

2. a) A card is drawn from a pack of 52 playing cards. What is the probability of drawing black card? 6M

   b) State and prove Baye's theorem. 8M

UNIT–II

3. a) The mean and variance of a binomial variable X with parameters n and p are 16 and 8. Find P(x ≥ 1) and P(x > 2) 7M

   b) Find the continuous probability function $f(x)=k\,x^2\,e^{-x}$ when x≥ 0 find (i) k (ii) mean 7M

OR

4. a) In a normal distribution, 7% are under 35 and 89% are under 63. Find the mean and the standard deviation of the distribution. 7M

   b) The weekly wages of 1000 workmen are normally distributed around a mean of Rs.70 with a standard deviation of Rs.5. Estimate the number of workers whose weekly wages will be (i) Between Rs.69 and Rs.72 (ii) Less than Rs.69 (iii)More than Rs.72. 7M

UNIT–III

5. a) The variance of population is 2. The size of the sample collected from the population is 169. What is the standard error of mean 7M

   b) A population consists of 5, 10, 14, 18, 13, 24. Consider all possible samples of size 2 which can be drawn without replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means. 7M

OR

6. The mean and standard deviation of marks scored by a sample of 100 students are 67.45 and 2.92. Find (i) 95% and (ii) 99% confidence intervals for estimating the mean marks of the student population. 14M

UNIT–IV

7. A sample of 900($n=900$) members has a mean 3.4cm ($\bar{x}=3.4$)and standard deviation 2.61cm ($\pm=2.61$) is the sample has been taken from a large population of mean 3.25cm ($\ll=3.25$)and standard deviation 2.61cm. if the population is normal and its mean is unknown . 14M

OR

8. A manufacturer of electronic equipment subjects sample of two completing brands of transistors to an accelerated performance test. If 45 of 180transistors of the first kind and 34 of 120 transistors of the second kind fail the test. What he conclude at the level of significance $\sim = 0.05$ about the difference between the corresponding sample proportions. 14M

UNIT–V

9. The number of automobile accidents per week in a certain community are as follows 12, 8, 20, 2, 14, 10, 15, 6, 9, and 4. Are these frequencies in agreement with the belief that accident conditions were the same during this 10 week period 14M

OR

10. In an investigation on the machine performance, the following results are obtained

	No. of units inspected	No. of defectives
Machine I	375	17
Machine II	450	22

Test whether there is any significant performance of two machines at α = 0.05 14M

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