

R09

Code No: F3104

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**MCA I Semester Examinations January - 2018****PROBABILITY AND STATISTICS****Time: 3hrs****Max.Marks:60**

Answer any five questions
All questions carry equal marks

- 1.a) A can hit a target once in 5 shots. B can hit 2 in 3 shots. C can hit one among 4. What is the probability that exactly two shots hit the target?
- b) In a certain town 40% have brown hair, 25% have brown eyes and 15% have both brown hair and brown eyes. A person is selected at random from the town.
- i) If he has brown hair, what is the probability that he has brown eyes?
- ii) If he has brown eyes, what is the probability that he does not have brown hair? [6+6]
- 2.a) A continuous Random variable has the p.d.f $f(x) = \begin{cases} K(1-x^2), & 1 \leq x \leq 4 \\ 0 & \text{else where} \end{cases}$.
- Determine: i) K ii) the mean iii) variance.
- b) The probability that the life of a bulb of 100- days is 0.05. Find the probability that out of 6 bulbs.
- i) At least one ii) None iii) more than 4 will have a life of 100 days. [6+6]
- 3.a) If the variance of a Poisson variate X is 2, find the probability that
- i) $x=0$ ii) $1 < x < 4$ iii) $0 < x < 3$
- b) 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? [6+6]
4. A population consists of five numbers 5, 8, 15, 24, 32. Consider all Samples of size two which can be taken without replacement from this population. Find:
- a) The population mean.
- b) The population Standard deviation.
- c) The mean of the sampling distribution of mean.
- d) Standard deviation of the sampling distribution of mean. [12]
- 5.a) A sample of 400 items is taken from a population whose standard deviation is 18. The mean of the sample is 82. construct 95% confidence interval for population mean.
- b) A sample of 121 students is found to have a mean weight of 68 kgs. Can this be regarded as a sample from a population with mean weight 75 kgs and standard deviation 31 kgs. [6+6]

- 6.a) In a city A 20% of a random sample of 900 school boys had a certain slight physical defect. In another city B 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions is significant at .05 level of significance.
- b) Studying the flow of traffic at two busy junctions between 4 p.m and 6. p.m to determine the possible need for turn signals. It was found that on 40 week days there were on the average 247.3 cars approaching the first junctions from the south which made left turns, while on 30 week days there were on the average 254.1 cars approaching the first junction from the south which made left turns. The corresponding sample standard deviations are 15.2 and 18.7 Test the significance between the difference of two means at 5% level. [6+6]
7. Four methods are under development for making discs of a super conducting material. Fifty discs are made by each method and they are checked for super conductivity when cooled with liquid nitrogen.

	Method-I	Method-II	Method-III	Method-IV
Super Conductor	31	42	22	25
Failures	19	8	28	25

Perform a Chi-square test at 0.05 level whether there is a significance difference between the proportions. [12]

8. Calculate the coefficient of correlation and the two lines of regression between the two variables x and y. [12]

x	55	56	58	59	60	60	62
y	35	38	38	39	44	43	44

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