

Code No: 132AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year II Semester Examinations, November/December - 2020****MATHEMATICS-III****(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, MIE, PTM, CEE, MSNT)****Time: 2 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

1. Derive the formula for finding the mean of the binomial distribution. [15]
2. Find the moment generating function of $f(x) = \frac{1}{8} 3c_x$, $x = 0, 1, 2, 3$ and hence find its mean and variance. [15]
- 3.a) The mean of certain normal population is equal to the standard error of the mean of the samples of 64 from that distribution. Find the probability that the mean of the sample size 36 will be negative.
b) Distinguish between the point estimation and interval estimation. [7+8]
- 4.a) In 1950 in India the mean life expectancy was 50 years. If the life expectancies from a random sample of 11 persons are 58.2, 56.6, 54.2, 50.4, 44.2, 61.9, 57.5, 53.4, 49.7, 55.4, 57.0. Does it confirm the expected view?
b) If the sample of size 36 is taken and the mean and standard deviation of samples are 50 and 6. Find the probability that x lies between 48 and 51. [7+8]
- 5.a) A random sample of 500 pineapples was taken from a large consignment and 65 were found to be bad. Show that the S.E. of the proportion of bad ones in a sample of this size is 0.015 and deduce that the percentage of bad pineapples in the consignment almost certainly lies between 8.5 and 17.5.
b) Discuss various types of alternative hypothesis with suitable example. [7+8]
- 6.a) A machine runs on an average of 125 hours/year. A random sample of 49 machines has an annual average use of 126.9 hours with standard deviation 8.4 hours. Does this suggest believing that machines are used on the average more than 125 hours annually at 5% level of significance?
b) The average marks scored by 32 boys is 72 with a standard deviation of 8. While that for 36 girls is 70 with a standard deviation of 6. Does this indicate that the boys perform better than girls at level of significance 0.05? [7+8]
7. Find the root of the equation $3x - \overline{1 + \sin x} = 0$ by iteration method. [15]
8. Solve $\frac{dy}{dx} = x + x^2y$, $y(0) = 1$ for $y(0.1)$ using Runge kutta method. [15]

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