R15

Code No: 821AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA I Semester Examinations, August - 2017
PROBABILITY AND STATISTICS

Time: 3hrs **Max.Marks:75**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

1.a) Write the axioms of Probability. [5]
b) Derive a formula for the mean of Binomial distribution. [5]
c) Define one tailed and two tailed tests. [5]
d) The standard deviations of two samples are 8 and 12, Samples sizes are 200 and 100. Find the standard error of the difference between the means and also find the confidence interval at 0.05 level. Means of the sample are 60, 50. [5]
e) The Regression equations of two variables x and y are $x = 0.7\ y + 5.2$ and $y = 0.3\ x + 2.8$. Find the Coefficient of Correlation and the means of x and y. [5]

PART - B

5 × 10 Marks = 50

2.a) A can hit a target once in 5 shots, B can hit 2 among 3. C can hit one among 4. What is the probability that two shots hit the target?
b) The probability of A, B and C to become M.D's of a factory are ¼, 1/3 and 5/12. The probability that bonus scheme will be introduced if they become M.D's are 0.02, 0.03 and 0.04 Find the probability of becoming M.D's, if scheme will be introduced. [5+5]

OR

3.a) Two dice are thrown. Let A be the event that the sum on the faces is 9. Let B be the event that at least one number is 6. Find the probabilities of the following events.
i) $A \cap B^C$ ii) $A^C \cup B$
b) In a certain college 25% of boys and 10% of girls are studying Mathematics. The girls constitute 60% of the students. If a student is selected and is found to be studying Mathematics, find the probability that the student is a i) Girl ii) boy. [5+5]

4.a) A die is thrown 8 times. If getting a 2 or 4 is a success, find the probability of getting
i) 4 successes. ii) $P(x \leq 3)$
b) If the masses of 300 students are normally distributed with mean 68 kgs and standard deviation 3kgs.How many students have masses Greater than 72 kgs. [5+5]

OR

5.a) Given that 2 P(x=0)=p(x=2) for a Poisson variate X. Find the Probability that i) $x \leq 3$ ii) $2 < x \leq 5$

b) The marks obtained by 1000 students is normally distributed with mean 78 % and Standard deviation 11%. Determine how many get more than 90%. [5+5]

6.a) A simple sample of heights of 6400 Englishmen has a mean of 67.85 and Standard deviation of 2.56 inches. While a simple sample of heights of 1600 Australian has a mean of 68.55 and a S.D. of 2.52 inches Test the significance between the two mean.

b) A random sample of 400 items was taken from a population, whose standard deviation is 10.The mean of the sample is 40. Test at 90% level whether the sample had been drawn from a population whose mean is 38. [5+5]

OR

7. Random samples of 600 men and 900 women in a locality were asked whether they would like to have a bus stop near their residence .350 men and 475 women were in favour of the proposal. Test the significance between the difference of two proportions at 5% level. [10]

8. Two horses A, B were tested according to the time (in seconds) to run a particular track with the following results.

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Test whether the two horses have the same running capacity at 95 % level. [10]

OR

9. A story writer is bringing out a new story book. He wants to determine whether the story will appeal to a particular age group or to all age groups. He takes a random sample of 200 and got their opinion as follows. Use χ^2 test to test whether opinion of the story age group [10]

Age group opinion.	Below 20	20-39	40-59	60 and above
Liked the story	35	30	15	20
Dislike the story	15	20	5	20
Indifferent	10	5	10	15

10. Fit a parabola to the following data [10]

X	2	4	6	8	10
Y	3.7880	17.2460	41.4640	7 6.4420	122.1800

OR

11. 10 observations on price x and the supply y the following data were obtained.
$\sum x = 130$, $\sum y = 220$, $\sum x^2 = 2288$, $\sum y^2 = 5506$, $\sum xy = 3467$
Obtain the line of regression of y on x and estimate the supply when the price is 16 units and also find the standard error of estimate. [10]

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