Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

MCA (Two Years) S2 (R,S) Degree Examination May 2025

Course Code: 20MCA162

Course Name: APPLIED STATISTICS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. *Marks*

1	Define discrete random variable and continuous random variable with examples.	(3)
2	A random variable X takes the values 1, 2, 3 and 4 such that $2P(X=1) = 3P(X=2) = P(X=3) = 5P(X=4)$. Find the probability distribution of X.	(3)
3	Define probability density function and give its two properties.	(3)
4	Write the pdf of exponential function, its mean and its variance.	(3)
5	The two lines of regressions are $x+2y-5=0$ and $2x+3y-8=0$. Find the coefficient of correlation between x and y.	(3)
6	Define confidence interval.	(3)
7	If the standard error of the mean is 50 for a sample of size 25 drawn from a population, what is the standard error of the mean when the sample size is 64?	(3)
8	Define sampling and discuss any two types of sampling.	(3)
9	Define level of significance.	(3)
10	Give the procedure for testing of hypothesis on mean of two populations.	(3)

PART B

Answer any one question from each module. Each question carries 6 marks.

Module I

11	Eight unbiased coins were tossed simultaneously. Find the probability of getting (i) Exactly 4 heads (ii)No head (iii) 6 or more heads (iv) At most 2 heads	(6)

OR

12	Define binomial random variable. Write the pdf and derive the mean and variance of binomial distribution.	(6)

Module II

13 The mileage obtained by the car owners with a certain kind of radial tyre is a random variable following exponential distribution with mean 40,000 km. Find the probability that one of these tyres will last (i) at least 20,000 km (ii) at most 30,000 km. (6)

OR

14 In an examination, 30% of the students got marks below 40 and 10% got marks above 75. Assuming the marks are normally distributed find the mean and standard deviation of the distribution. (6)

Module III

15 Fit a curve of the form $y = a + bx$ to the following data (6)

x	1	2	3	4	5	6
y	0.56	0.89	1.04	1.63	2.95	6.5

OR

16 From the following data, find the regression equation of y on x (6)

x	2	3	4	5	6
y	3	5	4	8	9

Module IV

17 The number of trips to a grocery store per week was recorded for a randomly selected collection of households in a town, with the results shown in the following frequency table (6)

No of trips (x)	0	1	2	3	4	5
No of households(f)	1	16	28	22	12	6

Construct a 95% confidence interval for the average number of trips to a grocery store per week for all households.

OR

18 A random sample of 49 packets of a certain brand of chocolate bar yield a mean weight 35 gm with a standard deviation of 11 gm. Find a 98% confidence interval. (6)

Module V

19 An insurance agent has claimed that the average age of policy holder who insure through him is less than 30.5 years. A random sample of 100 policy holders who had insured through him reveals that the mean and standard deviation are 28.8 years and 6.35 years respectively. Test his claim at 5% level of significance. (6)

OR

20 A small component in an electronic device has two small holes where another tiny part is fitted. In the manufacturing process the average distance between the two holes must be tightly controlled at 2 mm, else many units would be defective and wasted. Many times throughout the day, quality control engineers take a small sample of the components from the production line, measure the distance between the two holes and make adjustments if needed. Suppose at one time, four units are taken with mean 2.07 and variance 0.029. (6)

Determine at 1% level of significance, if there is sufficient evidence in the sample to conclude that an adjustment is needed. Assume the distances are normally distributed.

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