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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER MCA DEGREE EXAMINATION, DECEMBER 2017

Course Code: RLMCA105

Course Name: APPLIED PROBABILITY AND STATISTICS

Max. Marks: 60 Duration: 3 Hours

Statistical tables can be used.

PART A

Answer all questions, each carries 3 marks. Marks

1 Why Arithmetic Mean is considered as best measure of central tendency? (3)
2 State multiplication theorem of probability. (3)
3 Define Binomial distribution and write its mean and variance. (3)
4 Derive mean of Geometric distribution. (3)
5 Define mean and variance of a continuous random variable. (3)
6 Define Normal distribution. (3)
7 Define critical region and level of significance. (3)
8 Define Stratified Sampling. (3)

PART B

Answer six questions, one full question from each module and carries 6 marks.

Module I

9 Find the missing frequencies of the following distribution. It is known that mean is 50 and total number of families is 100. (6)

Expenditure	0-20	20-40	40-60	60-80	80-100
No of families	14	…..	27	…..	15

OR

10 Scores of two batsmen A and B during a certain match are as follows. (6)

Batsman A	10	12	80	70	60	100	0	4
Batsman B	8	9	7	10	5	9	10	8

Compare their variance and find who is more consistant.

Module II

11 Probability that A solves the problem in Statistics is $\frac{2}{5}$.The probability that B solves it is $\frac{3}{8}$. If they try independently find the probability that (i) both solve the problem (ii) none solves the problem (iii) at least one solves the problem. (6)

OR

12 The chance that doctor A will diagnose disease B correctly is 60%. The chance that the patient will die by his treatment after correct diagnosis is 40% and the (6)

chance of death by wrong diagnosis is 70%. A patient of doctor A, who had disease B died. What is the chance that his disease was correctly diagnosed?

Module III

13 Seven coins are tossed and number of heads are noted. The experiment is repeated 128 times and the following distribution is obtained. Fit a Binomial distribution to the following data. (6)

No of heads	0	1	2	3	4	5	6	7
Frequencies	7	6	19	35	30	23	7	1

OR

14 If the probability that an individual suffers a bad reaction from an injection is 0.001,find the probability that out of 2000 individuals (i)at least 2 (ii) at most 3 (iii) none will suffer from a bad reaction. (6)

Module IV

15 (6)

A continuous random variable has PDF $f(x) = \begin{cases} k(1-x^2), 0 < x < 1 \\ 0 \ , otherwise \end{cases}$

(i) Find k (ii) Find mean (iii) Find P(0.4< x< 0.6)

OR

16 Of a large group of men,5% are under 60 inches in height and 40% are between 60 and 65 inches. Assuming normal distribution find mean and standard deviation. (6)

Module V

17 If 1-gallon of a certain paint covers on the average 513.3 ft^2 andstandard deviation of 31.5 ft^2,what is the probability that the mean area covered by a sample of 40 of these cans will be anywhere from 510.0 ft^2 to 520 ft^2 ? (6)

OR

18 Let the observed values of a random sample of size 9 from a normal distribution be 8.6 , 7.9 ,8.3, 6.4, 8.4, 9.8, 7.2, 7.8, 7.6 . Construct a 90% confidence interval for σ^2 . (6)

Module VI

19 A filling machine is expected to fill 5 kg of powder into bags. A sample of 5 bags gave the following weights.4.7, 4.9, 5.0, 5.1, 5.2 Test whether the machine is working properly (6)

OR

20 Intelligence test of two groups gave the following results: (6)

	Mean	S.D	Number
Girls	84	10	121
Boys	81	12	81

Is the difference in mean scores significant?

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