

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**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 consistent.

**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 A continuous random variable has PDF  $f(x) = \begin{cases} k(1-x^2), & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$  (6)

(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  $513.3 \text{ ft}^2$  and standard deviation of  $31.5 \text{ ft}^2$ , what is the probability that the mean area covered by a sample of 40 of these cans will be anywhere from  $510.0 \text{ ft}^2$  to  $520 \text{ ft}^2$ ? (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  $\sigma^2$ . (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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