Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER MCA (REGULAR) DEGREE EXAMINATION, JULY 2017

Course Code**: RLMCA105**

Course Name**: APPLIED PROBABILITY & STATISTICS**

Max Marks: 60 Duration: 3 Hours

(Usage of statistical tables permitted.)

PART A

Answer All Questions. Each question carries 3 marks.

1. State the merits and demerits of mean, median and mode.
2. State Bayes theorem.
3. What is meant by random variables?
4. Define geometric distribution. Write its mean and variance.
5. Define continuous uniform distribution. Write its mean and variance.
6. Define conditional probability distributions.
7. What are the different types of sampling errors?
8. State Central Limit Theorem.

PART B

Answer All Questions. Each question carries 6 marks.

MODULE I

9. A number of particular articles have been classified according to their weights. After drying for two weeks the same articles have again been weighed and similarly classified. It is known that the median weight in the first weighing was 20.38oz, while in the second weighing it as 17.35oz. Some frequencies a and b in the first weighing and x and y in the second are missing. It is known that a=x/3 and b=y/2. Find the missing frequencies.

Class	0-5	5-10	10-15	15-20	20-25	25-30
Frequency(first weighing)	a	b	11	52	75	22
Frequency(second weighing)	x	y	40	50	30	28

OR

10. For a group containing 100 observations, the arithmetic mean and variance are 8 and 10.5 respectively. For 50 observations selected from these 100 observations, the mean

and standard deviation are 10 and 2 respectively. Calculate the values of mean and standard deviation for the other half.

MODULE II

11. The probability that a lab specimen contains high levels of contamination is 0.10. Five samples are checked and the samples are independent.
    a) What is the probability that none contains high level of contamination?
    b) What is the probability that at least one contains high levels of contamination?

OR

12. A company has 3 plants to manufacture 8,000 scooters in a month. Out of 8,000 scooters, Plant I manufactures 4,000 scooters, Plant II manufactures 3,000 scooters and Plant III manufactures 1,000 scooters. At plant I, 85 out of 100 scooters are rated of standard Quality or better; Plant II only 65 out of 100 scooters are rated Standard quality or better and at Plant III, 60 out of 100 scooters are rated of standard quality or better. What is the probability that the scooter selected at random came from (a) Plant I (b) Plant II (c) Plant III, if the scooter is of standard quality.

MODULE III

13. Assume that half of the population is vegetarian so that the chance of an individual being a vegetarian is ½. Assuming that 100 investigators each take a sample of 10 individuals to see whether they are vegetarians, how many investigators would you expect to report that 3 people or less were vegetarian?

OR

14. A firm has two cars which it hires out day by day. The number of demand for a car on each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days in which a) neither car is used b) some demand is refused.

MODULE IV

15. The average income of an officer is Rs.15000, standard deviation is Rs.5000. If there are 242 officers drawing salary above 18500, how many officers are there in the company?

OR

16. Time taken by the crew of a company to construct a small bridge is a normal variate with mean 400 labour hours and standard deviation of 100 labour hrs. a) What is the probability that the bridge gets constructed between 350 to 450 labour hrs? b) If the company promises to construct the bridge in 450 hrs or less and agrees to pay a

penalty of Rs.100 for each labour hr spent in excess of 450, what is the probability that the company pays a penalty of at least Rs.2000?

MODULE V

17. Explain different types of sampling.

OR

18. A random sample of 700 units from a large consignment showed that 200 were damaged. Find a) 95% and b) 99% confidence limits for the proportion of damaged units in the consignment.

MODULE VI

19. Ten boxes are taken at random. The mean net weight of 10 boxes is 11.8 and standard deviation is 0.15. Does the sample means differ significantly from the intended weight of 12? (use 5% level of significance).

OR

20. A group of 5 patients with medicine A weighs 42,39,48,60 and 41 kilograms. Second group of 7 patients treated with medicine B weighs 38, 42, 56, 64, 68, 69 and 62 kilograms. Do you agree with the claim that medicine B decreases the weight significantly?

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