Master of Commerce 1st Semester Examination

1127

QUANTITATIVE METHODS FOR BUSINESS

(Same for USOL Candidates)

Paper : M.C-102

Time : 3 Hours]   [Max. Marks : 80

Note :– Attempt *five* questions in all, selecting at least *one*

question from each Unit. All questions carry equal

marks.

Unit–I

1. (a) Define independent and mutually exclusive

events. Can two events be mutually exclusive

and independent simultaneously ? Support your

answer with the help of an example.

(b) A bag contains 8 balls of which 5 are red and 3 are white. If a man selects 2 balls at random from the bag, what is the probability that he will get one ball of each colour ? 8,8

2. (a) In a large institution, 2.28 per cent of employees receive income below Rs. 4,500 and 15.8% of employees receive income above Rs. 7,500 p.m. Assuming normal distribution, find mean standard deviation of income.

(b) When does binomial distribution hold good ? Explain with examples. 8,8

3. (a) A manufacturing process turns out articles that, on the average, are 10% defective. Compute the probability of 0, 1, 2, and 3 defective articles that might occur in a sample of 3 articles.

(b) What do you understand by theoretical distributions ? Discuss their utility in Statistics. 8,8

Unit–II

4. (a) At an inspection station, the probability of acceptance of the items is 0.9. If a sample of 10 items is taken. What is the probability that the number of accepted items is between 6 and 9 ?

NA–186 (2)

(b) Point out the importance of sampling in solving business problems. What are the basic principles on which sampling theory rests ?   8,8

5. (a) A sample of 100 gave a mean of 7.4 kg and a standard deviation of 1.2 kg. Find 95% confidence limits for the population mean.

(b) What is standard error of a statistic ? What does it measure ? If for a random sample of size 100, the variance of X values is 529, estimate the standard error of mean $(\overline{X})$.   8,8

6. (a) What is the purpose of hypothesis testing ?

(b) Briefly describe the steps involved in performing a two-side test concerning a population mean based on a confidence interval.   8,8

Unit-III

7. (a) Discuss the F-test for testing the quality of two sample variances. State clearly the assumptions involved.

(b) In one sample of 10 observations, the sum of the squares of the deviations of the sample values from sample mean was 120 and in the other sample of 12 observations it was 314. Test whether the difference is significant at 5 per cent level. Apply F-test.   8,8

NA–186   (3)

8. The time taken by workers in performing a job by method I and method II is given below :

Method I : 20   16   26   27   23   22

Method II : 27   33   42   35   32   34   38

Do the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly ?   16

Unit–IV

9. An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units :

     17, 15, 14, 26, 9, 4, 19, 12, 9, 15

Calculate control limits for the number of defective units and state your conclusion.   16

10. (a) Explain the following terms in the context of SQC :

Specification Limits, Tolerance Limits and Control Limits.

(b) What is quality control ? How are control limits set up ? Describe the different types of control charts.   8,8