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Master of Commerce 1st Semester

(1129)

QUANTITATIVE METHODS FOR BUSINESS

(Same for USOL Candidates)

Paper—M.C.–102

Time Allowed : Three Hours] **[Maximum Marks : 80**

Note :— Attempt any **five** questions in all, selecting at least **one** question from each unit.

UNIT—I

1. (a) What do you mean by Poisson Distribution and discuss its main properties ?

   (b) Fit a Poisson Distribution to the following data and calculate expected frequencies :

No. of Deaths	0	1	2	3	4
Frequency	109	65	22	3	1

Also find Mean and Variance of the above distribution. (Given $e^{-0.66} = 0.5432$). 8,8

2. (a) A problem in Statistics is given to three students A,B and C whose chances of solving it are $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{4}$. What is the probability that the problem will be solved ?

(b) Four cards are drawn with and without replacement. What is the probability that they are all Kings ? 8,8

3. (a) An aptitude test for selecting officers in a bank was conducted on 1000 candidates, the average score is 42 and the standard deviation of scores is 24. Assuming normal distribution for the scores, find :

(i) The number of candidates whose score exceeds 60.

(ii) The number of candidates whose score lies between 30 and 66.

(b) In a town, 10 accidents took place in a period of 50 days. Assume that the number of accidents per day follow Poisson distribution. Find the probability that there will be three or more accidents per day. (Given $e^{-0.2} = 0.8187$). 8,8

UNIT—II

4. (a) Describe the important properties of a good estimator.

(b) A random sample of size 64 has been drawn from a population with standard deviation 20. The mean of the sample is 80. Calculate 95 % and 99 % confidence limits for the population mean. 8,8

5. (a) Explain the terms :

(i) Statistics and parameter

(ii) Level of Significance

(iii) Type I and Type II errors

(iv) Acceptance and Rejection Region.

(b) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers ? 8,8

UNIT—III

6. (a) What is standard error of a statistic ? What does the standard error of a statistic measure ? If for a random sample of size 100, the variance of X values is 529, estimate the standard error of mean.

(b) A machine puts out 16 imperfect articles in a sample of 500. After the machine is over-hauled it puts out 3 imperfect articles in a batch of 100. Has the machine improved ? 8,8

UNIT—III

7. (a) What do you understand by Small Sample Tests ? How are they different from large sample tests ? Can these tests be used for large samples also ?

(b) A random sample of size 16 has mean 53. The sum of the squares of the deviations taken from mean is 135. Can this sample be regarded as taken from the population having 56 as mean ? Table value of t at 5 % level of significance and 15 degree of freedom is 2.13. 8,8

8. (a) Explain the meaning of Analysis of Variance. Outline the various steps for ANOVA testing in one-way classification.

(b) Set up ANOVA for the adjoining data for three varieties of wheat each grown on 4 plots. State whether the variety differences are significant :

	Variety of Wheat		
Plot of Land	**A**	**B**	**C**
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

You are given $F_{0.05(2, 9)}$ is 4.26. 8,8

UNIT—IV

9. (a) What is control chart ? Explain the basic principles underlying control chart. Also discuss the role of control charts in manufacturing processes.

(b) During an assumption of equal length of cloth, the following is the number of defects observed :

2	3	4	0	5	6	7	4	3	2

Draw a control chart for the number of defects and comment whether the process is under control or not. 8,8

10. (a) What do you mean by SQC ? What are the advantages when a process is working in a state of statistical control ?

(b) Distinguish between process control and product control. How are they achieved ? 8,8