QP Code: 22/PT/9/VII(NEW)

POST-GRADUATE COURSE

Term End Examination — June, 2022/December, 2022

COMMERCE (New Syllabus)

Paper-VII : STATISTICS FOR MANAGERIAL DECISIONS

(From January 2022 Enrolment Session)

Time : 2 hours] [Full Marks : 50

Weightage of Marks : 80%

Special credit will be given for accuracy and relevance in the answer. Marks will be deducted for incorrect spelling, untidy work and illegible handwriting. The weightage for each question has been indicated in the margin.

Use of scientific calculator is strictly prohibited.

Module - I

Answer any *two* of the following questions : 12½ × 2 = 25

1. (a) What is Probability ? If three coins are tossed simultaneously, what is the probability of getting 3 heads ? 2 + 4½

   (b) A box contains 5 white balls and 7 black balls. One ball is drawn at random from the box. What is the probability that it is black ? 6

2. (a) What is random variable ? Explain discrete random variables with example. 2½ + 4

   (b) Suppose that half of the populations of a town are consumers of rice. 100 investigators are appointed to find out its truth. Each investigator interviews 10 individuals. How many investigators do you expect to repeat that three or less of the people interviewed are consumers of rice ? 6

3. (a) The monthly income of 1,000 salesmen employed by a company is known to be approximately normally distributed. If the company wants to be 95% confident that the true mean of this month's income does not differ by more than 2% of the last month's mean income of Rs. 40,000. What sample size would be required ? Assume that the population standard deviation is Rs. 3,500. 6½

(b) A simple random sample from a population of 5,000 items is to be drawn to estimate the per cent defective within 2% of the true value with 95% probability. What would be the size of the sample if the population is assumed to be infinite ? [$p = 0{\cdot}02$]. 6

4. (a) What is multiple regression ? Discuss the applications of multiple regression. 2 + 4

(b) Distinguish between partial correlation and multiple correlations. 6½

Module - II

Answer any *two* of the following questions : $12\frac{1}{2} \times 2 = 25$

5. (a) From the following data, find out the missing frequencies :
(AB) = 900, (A) = 2700, N = 9000, (B) = 5400. 6½

(b) From the following information find out whether the data are consistent or not :
(A) = 100, (B) = 150, (AB) = 60, N = 500. 6

6. (a) What is hypothesis ? Distinguish between null hypothesis and alternative hypothesis. 3 + 3½

(b) The mean breaking strength of cables supplied by a manufacturer is 1,800 with a standard deviation 100. By a new technique in the manufacturing process, it is claimed that the breaking strengths of the cables have increased. In order to test the claim, a sample of 50 cables is tested. It is found that the mean breaking strength is 1850. Can we support the claim at 0·01 level of significance ? 6

7. (a) What is ANOVA ? What are the assumptions in ANOVA ? 2 + 4½

(b) State the methodology for two-way ANOVA. 6

8. (a) What is Statistical Quality Control ? Write the needs for Statistical Quality Control. 2 + 4½

(b) In order to construct a control chart, samples of size 3 are taken. The mean of the sample means is found to be 10.253 and the ranges of the samples of 3 observations each are 0.15, 0.53, 0.69, 0.45, 0.55, 0.71, 0.90, 0.68, 0.11 and 0.24. Find the upper and the lower control limits for mean chart. (Given that the constant of conversion for a sample of size n = 3 is A_2 = 1.023).

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