

Model Question Paper
Sampling Techniques and Statistical Inference - Part I

12th Standard

Business Maths

Reg.No. :

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I. Answer all the questions.

II. Use blue pen only.

III. Question number 15 is compulsory.

Time : 01:30:00 Hrs

Total Marks : 85

5 x 1 = 5

Part-A

- 1) The Z-value that is used to establish a 95% confidence interval for the estimation of a population parameter is
(a) 1.28 (b) 1.65 (c) 1.96 (d) 2.58
- 2) Probability of rejecting the null hypothesis when it is true is
(a) Type I error (b) Type II error (c) Sampling error (d) Standard error
- 3) Which of the following statements is true ?
(a) Point estimate gives a range of values (b) Sampling is done only to estimate a statistic (c) Sampling is done to estimate the population parameter
(d) Sampling is not possible for an infinite population
- 4) The number of ways in which one can select 2 customers out of 10 customers is
(a) 90 (b) 60 (c) 45 (d) 50
- 5) The standard error of the sample mean is
(a) Type I error (b) Type II error (c) Standard deviation of the sampling distribution of the mean (d) Variance of the sampling distribution of the mean

Part-B

5 x 6 = 30

- 6) A random sample of 50 branches of State Bank of India out of 200 branches in a district showed a mean annual profit of Rs.75 lakhs and a standard deviation of 10 lakhs. Find the 95% confidence limits for the estimate of mean profit of 200 branches.
- 7) A random sample of marks in mathematics secured by 50 students out of 200 students showed a mean of 75 and a standard deviation of 10. Find the 95% confidence limits for the estimate of their mean marks.
- 8) Out of 10000 customer's ledger accounts, a sample of 200 accounts was taken to test the accuracy of posting and balancing wherein 35 mistakes were found. Find 95% confidence limits within which the number of defective cases can be expected to lie.
- 9) A random sample of size 50 with mean 67.9 is drawn from a normal population. If it is known that the standard error of the sample mean is $\sqrt{0.7}$, find 95% confidence interval for the population mean.
- 10) A random sample of 500 apples was taken from large consignment and 45 of them were found to be bad. Find the limits at which the bad apples lie at 99% confidence level.

Part-C

5 x 10 = 50

- 11) A sample of five measurements of the diameter of a sphere were recorded by a scientist as 6.33, 6.37, 6.36, 6.32 and 6.37 mm. Determine the point estimate of (a) mean, (b) variance.
- 12) Measurements of the weights of a random sample of 200 ball bearings made by a certain machine during one week showed mean of 0.824 newtons and a standard deviation of 0.042 newtons. Find (a) 95% and (b) 99% confidence limits for the mean weight of all the ball bearings.
- 13) A sample poll of 100 voters chosen at random from all voters in a given district indicated that 55% of them were in favour of a particular candidate. Find (a) 95% confidence limits, (b) 99% confidence limits for the proportion of all voters in favour of this candidate.
- 14) The mean I.Q of a sample of 1600 children was 99. Is it likely that this was a random sample from a population with mean I.Q 100 and standard deviation 15 ? (Test at 5% level of significance)
- 15) a) The income distribution of the population of a village has a mean of Rs.6000 and a variance of Rs.32400. Could a sample of 64 persons with a mean income of Rs.5950 belong to this population ? (Test at both 5% and 1% levels of significance)

(OR)

- b) To test the conjecture of the management that 60 percent employees favour a new bonus scheme, a sample of 150 employees was drawn and their opinion was taken whether they favoured it or not. Only 55 employees out of 150 favoured the new bonus scheme Test the conjecture at 1% level of significance.
