

2026

COMMERCE

M.Com (2nd Semester)

Course No.:CM803C

(Statistical Analysis)

Full Marks: 60

Time: 3 hours

The questions are of equal value

The figures in the margin indicate full marks for the questions

Answer **all** questions



1. (a) Define Probability. Explain Bayes' Theorem and its significance in probability theory. (2+10 = 12)

(OR)

(b) A service desk receives 4 customers on average every 8 minutes, with arrivals assumed to be random.

(i) What is the probability that exactly 6 customers arrive in 8-minute interval?

(ii) If the probability that more than 6 customers arrive exceeds 0.25, the supervisor will increase staffing. Should staffing be increased?

(iii) Will there be any difference if the customer arrival time is 16 minutes for same 6 customers. (4+4+4 = 12)

2. (a) What is meant by sampling error? Explain the major sources of sampling and non-sampling errors in statistical investigations. (2+10 = 12)

(OR)

(b) Discuss the criteria of a good estimator in statistical inference. (5)

(c) From a population with known standard deviation of 1.65, a sample of 32 items resulted in 34.8 as an estimate of the mean. (7)

(i) Find the standard error of the mean.

(ii) Compute an interval estimate that should include the population mean 99 percent of the time.

3. (a) Two independent Sample of 9 and 8 items have the following values:

Sample A: 9 11 14 9 11 13 15 12 12

Sample B: 12 10 14 8 9 10 10 10

Using an appropriate t-test, determine whether the difference between two sample means is significant at the 5% level. (Critical Value at 5% = 2.131) (12)

(OR)

(b) Given paired observations on relief hours from Drug A and Drug B for 15 patients, test whether there is a significant difference between the two drugs using the Wilcoxon signed-rank test at $\alpha = 0.05$. (Critical Value at 5% = 25)

Drug A:	3.0	2	3.6	2.6	7.4	3	16	7	3.3	2	6.8	8.5	7	8	5.6
Drug B:	3.5	3.5	5.7	2.4	9.9	4	18.7	6.6	4.5	4	9.1	1.8	8.5	7.5	2.9

(12)

4. (a) Discuss the properties of Chi-square distribution.

(b) Explain the procedure for conducting a Chi-Square test of association between two categorical variables. (5+7=12)

(OR)

(c) Analyze the following data using analysis of variance to determine whether the yield differs significantly among three rice varieties at the 5% level of significance (F-table value = 4.26).

Per acre production data			
Plot of Land	Variety of Rice		
	A	B	C
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

(12)

5. (a) The following rankings were assigned by three teachers to five students based on their performance.

X:	1	2	3	4	5
Y:	5	4	3	2	1
Z:	3	5	2	1	4

Compute the Spearman's rank correlation coefficients and determine which pair of teachers has the most similar assessment. (12)

(OR)

(b) What is regression analysis? Explain the fundamental assumptions of linear regression and describe the common errors that may arise during regression analysis.

(2+5+5 = 12)
