



QP CODE: 25024608



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Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, APRIL 2025

Fourth Semester

M Sc STATISTICS

CORE - ST010401 - STATISTICAL COMPUTING IV USING R/SAS/MATLAB

2019 ADMISSION ONWARDS

0D105AED

Time: 3 Hours

Weightage: 30

(Answer any THREE questions. Each question carries a weight of 10)

1. The following data relates to the demand x and price p of a commodity. Fit a suitable demand law and find the elasticity of demand.

p	16	20	20	24	28	32	36
x	82	70	63	60	55	55	49

2. For the simultaneous equation model

$$Y_{1t} = \beta_{12}Y_{2t} + \gamma_{11}X_{1t} + U_{1t}; \quad Y_{2t} = \beta_{21}Y_{1t} + \gamma_{22}X_{2t} + \gamma_{23}X_{3t} + U_{2t}$$

where Y's are endogeneous and X's are exogeneous and U's are random components, find the two stage least squares estimate of parameters β_{12} and γ_{11} , given the following matrix of sum of products of observed values of X's and Y's

	Y_1	Y_2	X_1	X_2	X_3
Y_1	100	210	30	20	40
Y_2		500	5	50	160
X_1			100	5	10
X_2				50	5
X_3					40

3. Determine the optimum basic feasible solution to the following transportation problem. using matrix minimum method.

		To				
		1	2	3	4	Supply
From	A	5	3	6	4	30
	B	3	4	7	8	15
	C	9	6	5	8	15
	Demand	10	25	18	7	60





4. Solve the following traveling salesman problem so as to minimize the cost per cycle.

From/To	A	B	C	D	E
A	-	3	6	2	3
B	3	-	5	2	3
C	6	5	-	6	4
D	2	2	6	-	6
E	3	3	4	6	-

5. A process produces rubber belts in lot of sizes 2300. Inspection records on the last 20 lots reveal the following data.
- (a) Compute trial control limits for a fraction non conforming control chart.
 - (b) If you want to set up a control chart for controlling future production, how would you use the above data to obtain the control line and control limits for the chart.
 - (c) Draw the OC curve of the chart.
 - (d) Find the equivalent np- chart.

Lot. No	No of defective belts	Lot. No	No of defective belts
1	230	11	456
2	435	12	394
3	221	13	285
4	346	14	331
5	230	15	198
6	327	16	414
7	285	17	131
8	311	18	269
9	342	19	221
10	308	20	407

6. A company uses the following acceptance sampling procedure. A sample equal to 10% of the lot is taken. If 2% or less of the items in the sample are defective, the lot is accepted; otherwise it is rejected. If submitted lots vary in size from 5000 to 10000 units, what can you say about the protection by this plan? if 0.05 is the desired LTPD, does this scheme offer reasonable protection to the consumer?

