No. of Printed Pages : 5

MSTL–002(Set-I)

POST GRADUATE DIPLOMA IN APPLIED STATISTICS (PGDAST)

Term-End Practical Examination

June, 2026

MSTL-002(Set-I) : INDUSTRIAL STATISTICS LAB

Time : 3 Hours *Maximum Marks : 50*

Note : *(i) Attempt any **two** questions.*

(ii) Solve the questions in Microsoft Excel.

(iii) Use of Formulae and Statistical Tables Booklet for PGDAST is allowed.

(iv) Mention necessary steps, hypotheses, interpretations, etc.

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1. A company fills mango juice (200 ml) into cans. To monitor the weights of the juice, 20 samples each of 4 cans are taken randomly at an interval of 1 hour. The sample values are tabulated in the following table :

Sample No.	**Weight of cans (in ml)**			
1	215	212	213	195
2	210	208	198	199
3	208	215	217	210
4	200	205	211	195
5	218	190	198	204
6	200	200	214	220
7	225	209	230	220
8	203	203	199	195
9	250	250	240	240
10	210	205	200	210
11	212	210	210	210
12	210	190	198	199
13	220	180	198	200
14	220	190	195	210

15	205	200	198	200
16	210	205	190	204
17	212	200	200	201
18	204	205	200	200
19	200	195	190	198
20	200	198	195	195

(i) Which control charts should be used to control process variability and process mean weight of juice filled in the cans ?

(ii) Construct these charts and check whether the process is under statistical quality control or not.

(iii) Plot the revised control charts, if necessary. 25

2. A researcher wants to develop a regression model to predict the market price of a house and considers three variables 'size of house', 'age of house' and 'no. of bedrooms'. The researcher collected the following data :

Market Price (in Lakhs)	**Size (in square feet)**	**Age (in years)**	**No. of Bedrooms**
40.0	1605	15	2

42.0	2489	25	3
45.2	1552	10	2
50.2	2400	12	3
43.9	1800	15	3
53.5	1550	10	2
44.9	1700	6	3
58.0	3000	8	4
40.7	1600	15	3
42.0	2400	15	3
59.5	1800	2	3
63.9	2100	6	3
59.7	2100	10	3
64.5	2500	9	4
60.2	2300	15	3
89.5	2700	4	4
82.5	2500	5	3

(i) Build a regression model by selecting appropriate regressors in the model using stepwise method.

(ii) Check the linearity and normality assumptions for the regression analysis.

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3. The data given in the following table present the average quarterly prices (in rupees) of a commodity for five years :

Year / Quarter	2020	2021	2022	2023	2024
I	130	135	131	131	134
II	126	128	129	131	140
III	122	122	128	125	126
IV	131	136	132	135	140

(i) Compute seasonal indices using ratio to trend method.

(ii) Obtain deseasonalised values and then fit a linear trend.

(iii) Plot the original data along with deseasonalised values and trend values.

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