MSTL–001(Set-I)

POST GRADUATE DIPLOMA IN APPLIED STATISTICS (PGDAST)

Term-End Practical Examination

June, 2025

MSTL-001(Set-I) : BASIC STATISTICS LAB

Time : 3 Hours   *Maximum Marks : 50*

*Note : Attempt any **two** questions. Solve the questions in Microsoft Excel. Use of Formulae and Statistical Tables Booklet for PGDAST is allowed. Mention necessary steps, hypotheses, interpretation, etc.*

1. (a) The quarterly revenues data (in billions of ₹) from sales of a company are as follows :

Quar-ter	2006	2007	2008	2009	2010	2011	2012	2013
I	142.2	147.5	154.2	164.7	170.5	176.5	180.5	185.4
II	145.2	152.2	158.6	169.5	175.6	181.4	189.6	195.2
III	144.6	150.7	156.7	167.4	170.4	176.4	182.5	190.5
IV	157.5	163.2	170.1	180.1	186.5	190.5	198.1	207.4

  (i) Construct time-series plot of the given data and interpret.

  (ii) Which quarter is most consistent ?

4+6

(b) There are several methods for calculating fuel economy. The following table indicates the mileage (in km/litre) as calculated by the owners and based on the current government standards for 9 different makes of a company :

Makes	Owner	Government
1	30	34
2	31	36

3	56	55
4	56	69
5	105	97
6	35	38
7	49	58
8	67	67
9	75	90

(i) Compute the covariance and coefficient of correlation.

(ii) Represent the above data using a suitable diagram.

(iii) Compute the coefficients of skewness and kurtosis and interpret the results.   7+8

2. The data on 25 employees of a marketing company were collected to assess their efficiency. The data on their length of service and percentage efficiency score are given in the following table :

S. No.	Length of Service	Percentage Efficiency Score
1	5	68
2	11	84
3	7	70
4	11	85
5	7	65
6	8	70
7	9	71
8	7	72
9	10	81
10	8	74
11	6	66
12	12	90
13	12	89
14	9	76
15	10	79
16	5	63
17	7	83
18	9	84

19	9	80
20	10	79
21	11	75
22	10	78
23	9	71
24	8	70
25	11	84

(i) Compute the rank correlation coefficient between the length of the service and percentage efficiency score.

(ii) Draw the Box plots for both the variables on the same graph.   15+10

3. A Quick Commerce Industry (QCI) company wants to evaluate its key activities. The company authorities hire 7 evaluators to rate its key activities on the rating scale from 0 (low) to 100 (high). A Randonised Block Design was used to reduce the effect of variability within evaluators. The ratings given by the evaluators to the key activities are summarised in the following table :

Evaluator	Key Activity						
	A	B	C	D	E	F	G
1	75	86	78	72	65	84	85
2	80	92	82	79	78	90	90
3	70	94	83	78	69	86	92
4	84	76	91	69	82	79	85
5	88	74	96	85	89	70	86
6	64	74	98	79	80	70	80
7	83	80	94	80	79	90	83

Assuming that the key activities are the groups of interest and the effect of evaluation of each evaluator is normally distributed with equal variance (approximated), then :

(i) Analyse at 5% level of significance, whether on an average, the key activities differ significantly. If it is significant, then do the pairwise comparison between them.

(ii) Find out which activity is more consistent as far as performance is concerned.   15+10

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