

MSTL-001 (Set-2)

POST GRADUATE DIPLOMA IN APPLIED STATISTICS

(PGDAST)

Basic Statistics Lab

Duration : 3 hours

Maximum Marks : 50

Note : 1. Attempt any two questions.

2. Solve the questions in Microsoft Excel.

3. Use of formulae and Statistical Tables Booklet for PGDAST is allowed.

4. Mention necessary steps, hypotheses, interpretations, etc.

1. (a) There are several methods for calculating fuel economy. The following table indicates the mileage (in km/liter) calculated as per different makes of a car company:

Makes:	1	2	3	4	5	6	7	8	9	10
Owner	13.3	14.0	26.8	26.9	47.8	15.8	23.7	31.8	36.3	37.2
Government	15.8	16.8	25.2	33.2	46.6	17.8	27.5	32.5	55.0	56.1

- (i) Compute the co-variance and coefficient of correction & interpret the results.
- (ii) Compute first four raw moments & central moments.

(iii) Compute the coefficients of Kurtosis for owners and Government.
Also interpret the results.

(iv) Draw the box plot separately for owners and Government.

(3+6+3+8)

(b) An instructor claims that the average score of the students in a test is higher than 65. He samples ten students and obtains the scores as follows:

65, 65, 70, 67, 66, 63, 68, 72, 71, 63

He performs a hypothesis test to verify the claim at 5% level of significances assuming the data are from a normal distribution. 5

2. (a) The following data represent the number of days between the receipt of a complaint and the resolution of the complaint in a department.

54, 5, 35, 137, 31, 27, 152, 2, 123, 81, 74, 27, 11, 19, 126, 110, 110, 29, 61, 35, 94, 31, 27, 5, 12, 4, 165, 32, 29, 28, 29, 26, 25, 1, 14, 13, 13, 10, 5, 27, 4, 52, 30, 22, 36, 26, 20, 23, 33, 68

(i) Compute the mean, median, first quartile and third quartile.

(ii) Compute interquartile range, variance, standard deviation and coefficient of variation.

(iii) Is the data skewed? If so, how? (2+4+4)

(b) A supermarket that has a chain of stores is concerned about its service quality reputation perceived by its customers. The data given ahead show the perceived service quality with regard to politeness of the staff. The number in each cell of the data is the percentage of people who have said that the staff is polite.

<u>Day</u>	A	B	C	D	E
Monday	78	80	73	76	65
Tuesday	77	85	88	96	85
Wednesday	80	86	83	93	81
Thursday	79	82	80	87	82
Friday	69	73	76	88	67

Perform suitable test to examine whether significant differences at 1% level in politeness of the staff exist

- (i) Day wise and
- (ii) Stepwise carry out pairwise comparisons. If there are significant differences.

3. (a) The following data represent the time taken (in minutes) to resolve the complaints about the disconnecting calls by two different offices of a telecom company. (8+7)

Office I	16	18	8	29	6	17	41	34	13	32
Office II	81	38	11	12	7	6	34	22	59	41

Assuming that the time taken to resolve the complaints is normally distributed, test whether.

- (i) There is no significant difference between the variances of the distributions of time taken to resolve the complains at 5% level of significance.

(ii) There is no significant difference between average time taken to resolve the complaints in both offices.

(b) A researcher wishes to find out whether the average waiting time for a patient to meet a doctor in the emergency room at four hospitals (A, B, C and D) is equal. To study it, she takes a sample of patients in the emergency rooms of each hospital on a particular day and records the waiting time. The data are as follows: 10

Waiting Time (in minutes)			
Hospital A	Hospital B	Hospital C	Hospital D
10	12	15	15
12	10	20	17
09	20	15	15
12	15	12	18
10	10	18	15
12	08	20	17
08	10	15	16
10	18	15	14
12	15	10	15
10	10	15	17
15	15	14	18
12	20	13	10
10	15	15	15
12	15	20	12
18	18	24	15
	10	15	18
	14	12	

	12	12	
	20		
	15		

Assuming that the waiting time is normally distributed in each hospital and the variance of all waiting time distributions are approximately equal:

- (i) Formulate the null and alternative hypothesis.
- (ii) Test whether the average waiting times for a patient to meet a doctor in the emergency room of the hospitals are equal at 5% level of significance?
