

Question Paper consists of Part-A and Part-B  
Answer ALL the question in Part-A and Part-B

PART-A (10X2 = 20M)

- |   | Marks | CO  | BL |
|---|-------|-----|----|
| 1. a) What do you understand by dispersion? Explain briefly the various methods used for measuring dispersion.  | (2M)  | CO1 | L2 |
| b) Find the variance of the data set 10,60,50,30,40,20.   | (2M)  | CO1 | L2 |
| c) Given $P(A) = 0.35$ , $P(B) = 0.40$ and $P(A \cap B) = 0.20$ , Find<br>i) $P(A \cup B)$ ii) $P(\bar{A} \cap B)$ iii) $P(A \cap \bar{B})$ iv) $P(\bar{A} \cup \bar{B})$ . | (2M)  | CO2 | L3 |
| d) 20% of items produced from a factory are defective then find the probability that in a sample of 5 chosen at random (i) non defective. (ii) one is defective.            | (2M)  | CO2 | L5 |
| e) Find the value of finite population correction factor for $n=10$ and $N=1000$  | (2M)  | CO3 | L1 |
| f) If $S = \{1, 2, 3, 4, 5, 6, 7, 8\}$ then find $\mu_s$ .  | (2M)  | CO3 | L2 |
| g) For an F-distribution find $F_{0.95}$ with $v_1 = 19$ and $v_2 = 24$   | (2M)  | CO4 | L1 |
| h) Define Critical Region.  | (2M)  | CO4 | L1 |
| i) Explain about correlation.   | (2M)  | CO5 | L2 |
| j) What is the relation between correlation coefficient and regression coefficient?   | (2M)  | CO5 | L4 |

PART-B (5X10 = 50M)

- 2a. Find the Mean deviation about median of the data: 5(M) CO1 L5

Class Interval	20-30	30-40	40-60	60-80	80-90
Frequency	5	10	20	9	6

- b Obtain Karl Pearson's measure of skewness for the following data: 5(M) CO1 L1

Values	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	6	8	17	21	15	11	2

(OR)

- 3a. What do you understand by dispersion? Explain briefly the various methods used for measuring dispersion. 5(M) CO1 L1

- b Calculate the mean and standard deviation for the following table giving the age distribution of 542 members. 5(M) CO1 L5

Age (in years)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members	3	61	132	153	140	51	2

- 4a. A hospital switch board receives an average of 4 emergency calls in a 10 minute interval. What is the probability that (i) there are at most 2 emergency calls in a 10 minute interval (ii) there are exactly 3 emergency calls in a 10 minute interval. 5(M) CO2 L3

- 4b. Fit a Binomial Distribution to the following data 5(M) CO2 L5



X	0	1	2	3	4	5	6
f	13	25	52	58	32	16	4

(OR)

- 5a. For a discrete probability distribution

5(M) CO2 L4

X	0	1	2	3	4	5	6
F	0	2K	2K	3k	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K

Find (i) K (ii) mean (iii) Variance

- 5b. Fit a Binomial Distribution to the following data

5(M) CO2 L5

X	0	1	2	3	4	5
f	2	14	20	34	22	8

- 6a. Two types of new cars produced in USA are tested for petrol mileage. One sample is consisting of 42 cars averaged 15 kmpl with variance 2, while the other sample consisting of 80 cars averaged 11.5 kmpl with variance 1.5. Construct 95% confidence limits.

5(M) CO3 L5

- 6b. If 80 patients are treated with an antibiotics 59 got cure. Find a 98% confidence limits.

5(M) CO3 L3

(OR)

- 7a. A random sample of size 100 is taken from an infinite population having the *mean*  $\mu = 76$ , *variance*  $\sigma^2 = 256$ . What is the probability that  $\bar{x}$  will be between 75 and 78.

5(M) CO3 L3

- 7b. Find 95% confidence limits for the mean of normality distributed population from which the following sample was taken 15, 17, 10, 18, 16, 9, 7, 11, 13, 14.

5(M) CO3

- 8a. An ambulance service claims that it takes on the average less than 10 min to reach its destination in emergency calls. A Sample of 36 calls, as a mean of 11 minutes, and the variance of 16 minutes. Test the significance at 0.01 level.

5(M) CO4 L4

- 8b. The average marks scored by 32 boys is 72 with a S.D. of 8. While that for 36 girls is 70 with a S.D. of 6. Does this indicate that the boys perform better than girls at level of significance 0.05?

5(M) CO4 L4

(OR)

- 9a. Two horses A and B were tested according to the mean time (in seconds) to run a particular track with the following results

5(M) CO4 L4

A	28	30	32	33	33	29	34
B	29	30	30	24	27	29	---

Test whether the two horses have the same running capacity.

- 9b. Explain briefly the following i) Type I error (ii) Type II error (iii) Critical region.

5(M) CO4 L2

- 10a. Calculate the correlation coefficient for the following heights(in inches) of fathers (X) and their sons(Y):

5(M) CO5 L5

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

- 10b. Two random variables have the regression lines with equations  $3x+2y = 26$  and

5(M) CO5 L5

6.  $x + y = 31$ . Find the mean values and the correlation co-efficient between  $x$  and  $y$ .

(OR)

- 11a A sample of 12 fathers and their eldest sons gave the following data about their height in inches:

5(M) CO5 L5

Father	65	63	67	64	68	62	70	66	68	67	69	71
Son	68	66	68	65	69	66	68	65	71	67	68	70

Find the rank correlation coefficient.

- 11b Fit a parabola  $y = a + bx + cx^2$  to the following data:

5(M) CO5 L3

$x$	2	4	6	8	10
$y$	3.07	12.85	31.47	57.38	91.29

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