

(3 Hours)

Total Marks: 100

- N.B
- (1) Question No.1 is compulsory.
 - (2) Attempt any four questions out of remaining six questions.
 - (3) Assume necessary data but justify the same
 - (4) Figures to the right in paranthesis indicate full marks
 - (5) Use of scientific calculator is allowed

1. (a) Find Bowley's coefficient of skewness for the following data: (10)

Class Intervals	0-4	4-8	8-12	12-16	16-20	20-24	24-28
Frequency	10	12	18	7	5	3	4

- (b) X is normally distributed and the mean of X is 30 and standard deviation is 5. Find the probability of the following: (10)

1) $X \geq 45$ 2) $26 < X < 40$
 $P(0 \leq z \leq 2) = 0.4772$ $P(0 \leq z \leq 8) = 0.2881$ $P(0 \leq z \leq 3) = 0.4986$

2. (a) Find Spearman's rank correlation coefficient for the following data: (10)

Marks in DM	68	64	75	50	64	80	75	40
Marks in WT	62	58	68	44	81	60	68	48

- (b) An urn contains 6 white, 4 red and 9 black balls. A person draws 3 balls from the box at random. Find the probability that among the balls drawn none is red? (10)

3. (a) If X is a Poisson variate such that $P(X=2) = 9P(X=4) + 90P(X=6)$ Find the value of λ (10)

- (b) The first of the two samples has 100 items with mean 15 and standard deviation 3. If the whole group has 250 items with mean 15.6 and variance 13.44, find the standard deviation of the second group. (10)

4. (a) Find the mean and variance of Binomial distribution (10)

- (b) Obtain the median for the following frequency distribution. (10)

Wages (in Rs)	2000-3000	3000-4000	4000-5000	5000-6000	6000-7000
Number of workers	3	5	20	10	5

5. (a) A machinist is making engine parts with axle diameters of 0.7 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a standard deviation of 0.04 inch. Test if the work is meeting the specifications. Tabulated value of t is 1.833. (10)

- (b) In a random arrangement of the letters of the word "MISSISSIPPI", find the probability that all the I's come together (10)

6. (a) A continuous random variable x has the following probability density function: (10)
- $$f(x) = \begin{cases} ax & , 0 < x < 1 \\ a & , 1 < x < 2 \\ -ax + 3a & , 2 < x < 3 \\ 0 & , \text{otherwise} \end{cases}$$
- Compute $P(x < 1.5)$
- (b) The scores of 2 cricketers A and B in a series are: (10)
- A: 50 34 70 27 19
B: 81 0 15 68 25
- Find out who is more consistent using coefficient of variation
7. (a) Find the expectation of the number on a dice when thrown. Also find the variance. (10)
- (b) Weights in kilograms of 10 students is given below: (10)
- 38, 40, 45, 53, 47, 43, 55, 48, 52, 49
- Can we say that the variance of the distribution from which the above sample is drawn is 20 kg? (Tabulated value of Chi Square is 16.99)