

DATA ANALYSIS AND STATISTICAL TECHNIQUES (BCA 404)

Duration: 2 hours

Total Marks: 50

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

1. a. Explain the following with an example

Marks(1 X 5)

- i. Sample Space
- ii. Alternate hypothesis
- iii. Independent event
- iv. Mutually exclusive events
- v. Range

b. Answer the following questions.

Marks(1 X 5)

- i. State the multiplication theorem on probability.
- ii. Find the geometric mean of 20,40,25 and ~~15~~ 8
- iii. If $P(A)=\frac{1}{2}$, $P(B)=\frac{1}{3}$ and $P(A/B)=\frac{1}{6}$, find $P(A \cap B)$
- iv. Explain quota sampling.
- v. Find the probability of getting at least one head when a coin is tossed thrice.

2. Answer the following (Any two)

Marks(5 X 2)

a. Calculate the median for the following data

Height of students	90-100	100-110	110-120	120-130	130-140	140-150	150-160	160-170
frequency	0	37	65	80	51	35	18	4

b. Find the quartile deviation for the following data giving the income distribution of 70 workers in a factory.

Income (in Rs)	260-270	270-280	280-290	290-300	300-310	310-320	320-330
No. of workers	6	7	10	20	12	10	5

c. Calculate the coefficient of variation for the following data.

Weekly wages(in Rs.)	0-10	10-20	20-30	30-40	40-50
No.of workers	5	8	15	16	6

3. Answer the following (Any two)

Marks(5 X 2)

- a. An urn contains 6 white, 4 red and 9 black balls. If 3 balls are drawn at random, find the probability that (i) two of the balls are white, (ii) one is of each colour, (iii) none is red.
- b. A die is tossed 5 times. What is the probability of getting the number 2 on the die?
 (i) exactly thrice, (ii) at least thrice.
- c. If 2 percent of electric bulbs manufactured by a certain company are defective, find the probability that in a sample of 200 bulbs (i) less than 2 bulbs are defective, (ii) more than 3 bulbs are defective.

$$(e^{-4} = 0.0183)$$

4. Answer the following (Any two)**Marks(5 X 2)**

- a. In a random sample of 400 apples from a large consignment, 20 apples are found to be of bad quality. Find (i) 95% and (ii) almost certain confidence limits.
- b. A random sample of 100 families, found that the average monthly income per family was Rs.6000 with a standard deviation of Rs. 2000. Test the claim that the average monthly income of the population is Rs.7500.
- c. A large consignment of tennis balls is assumed to have 20% substandard balls. A sample of 400 balls is selected from it. Find the probability that the percentage of balls in the sample is (i) at most 16%, (ii) between 18% and 22%.
(Given $F(2)=0.9772$, $F(1)=0.8413$).

5. Answer the following (Any two)**Marks(5 X 2)**

- a. Calculate the rank correlation coefficient for the following data representing the marks in two tests of statistics for a group of 8 students.

Students	1	2	3	4	5	6	7	8
Marks in test I	68	95	52	65	70	68	59	65
Marks in test II	84	91	67	72	72	72	71	79

- b. Find Karl Pearson's coefficient of correlation for the following data.

x	6	2	10	4	8
y	9	11	5	8	7

- c. Find the regression line of y on x for the following data and estimate y when $x=19$.

x	18	26	28	31	25	19	35
y	11	16	19	17	14	11	24
