

DATA ANALYSIS AND STATISTICAL TECHNIQUES

Duration: 2 Hours

Total Marks: 50

Instructions:

1. Figures to the right indicate maximum marks
2. All questions are compulsory
3. Standard calculators are allowed

Q .1 Answer the following

a) Answer the following

(1X5=5)

- i. Write the equation of Regression of x on y if $\bar{x} = 2, \bar{y} = 5, \sigma_x = 4, \sigma_y = 3$ and $r = 0.9$
- ii. Write the formula for probability of an event A given that the event B had already occurred.
- iii. Write the formula for Quartile deviation
- iv. Define data mining
- v. What is range of a data?

b) Answer the following

(1X5=5)

- i. State Baye's theorem
- ii. Let A and B be two independent events, and let $P(A \cap B) = \frac{1}{6}$, and $P(A) = \frac{1}{3}$ then find $P(B)$ and $P(\bar{B})$
- iii. Differentiate between simple random sampling and purposive sampling (Give two points)
- iv. Find Median and Mode for the following data
10 9 2 5 3 2 5 2 4 7 8 6
- v. Given Mean = 70.2 and Mode = 70.5, find the Median using the equation of Mean, Median and Mode

Q .2 Answer the following (Any two)

(5X2=10)

a) Calculate Quartile deviation for the following data

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	10	20	10	15	15	10	20

b) Calculate standard deviation for the following

x	1	2	3	4	5	6	7	8
f	1	2	3	4	5	6	7	8

c) Compute the mode for the following (by grouping method)

Class interval	0-40	40-80	80-120	120-160	160-200	200-240	240-280	280-320
Frequency	4	12	40	41	27	13	9	4

Q .3 Answer the following (Any two)**(5X2=10)**

- a) Explain random sampling method
- b) A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign, the mean sales per week per soap were 160 dozens. After the campaign, a sample of 50 shops was taken. And the mean sales were found to be 167 dozens with standard deviation 22.4. What conclusion do you draw on the impact of advertisement on sales? Use 5% significance level and 1% level of significance
- c) Draw frequency polygon and Histogram for the following

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35
f	4	6	10	16	12	8	4

Q .4 Answer the following (Any two)**(5X2=10)**

- a) The probability that a man will be alive in 25 years is $\frac{3}{5}$, and the probability that his wife will be alive in 25 years is $\frac{2}{3}$. Find the probability that
- Both will be alive
 - Only wife will be alive
 - Only man will be alive
 - At least one of them will be alive
 - Both will not be alive
- b) Write a short note on normal distribution. Write the formula for a variable that follows normal distribution
- c) Write the formula for Poisson Distribution
If $\lambda = 0.72$ then find $p(0), p(1), p(2)$ and $p(3)$ where $e^{-0.72} = 0.4868$

Q .5 Answer the following (Any two)**(5X2=10)**

- a) Find coefficient of correlation by using Karl Pearson's method

X	10	20	30	40	50	60	70	80
Y	30	50	60	80	100	110	130	150

- b) Find coefficient of correlation by using Rank Method

X	93	98	91	92	95	90	96	97
Y	95	20	59	40	55	78	61	66

- c) Find regression equation of y on x

X	2	4	6	8	10	12	14	16
Y	9	13	17	21	25	29	33	37

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