

B.Sc. Semester-II Examination, 2022-23**FORESTRY [Honours]**

Course ID : 23517 Course Code : SH/FST/BS 1205

Course Title : Statistical Methods & Experimental Designs

Time : 2 Hours

Full Marks : 50

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Write a definition or one sentence answer any **ten** of the following: 1×10=10

- a) If the A.M. of 3, 5, 6, 2, X is y and that of 3, 5, 6, 2, x, y is x, find the values of x and y?
- b) Define quartile deviation.
- c) If two regression lines are perpendicular to each other what will be the value of correlation coefficient?
- d) Find the second quartile of the following data:
3,9, 2, 8, 7, 1, 1, 4, 5, 6, 6, 2, 9, 7, 8, 4, 6.
- e) In what condition, the distribution is said to have no mode?
- f) Find the Range of the following data: 0, 1, -1, -2, 6, 4, 5, 8, 12, 10, 11.

- g) Find the geometric mean of 3, 12 and 48?
- h) The arithmetic mean and variance of n values x_1, x_2, \dots, x_n are 0 and σ^2 respectively and y is a variable defined by $y = x^2$. Prove that $\bar{y} = \sigma^2$.
- i) What is the standard deviation of a set of equal values? .
- j) Can regression coefficients be of opposite signs? Give reasons.
- k) Write down the importance of histograms.
- l) If the variance of a set of observations is zero, then all the variate values are
 - i) in A.P.
 - ii) in G. P.
 - iii) equal
 - iv) positive
- m) Root mean square deviation is minimum when deviations are taken about
 - i) Mean
 - ii) Median
 - iii) Mode
 - iv) Any value.
- n) If mean and median of a frequency distribution are 20 and 17 respectively, find the mode.
- o) State the Law of Statistical Regularity.

2. Write short note/define any **ten** of the following:

$$2 \times 10 = 20$$

- a) The mean of 5 observations is 4.4 and their variance is 8.24. If 3 of the observations are 4, 6, 9, find the other two.
- b) The coefficient of variation is 40 and the mean is 30; find the standard deviation.
- c) Two batsmen performed the following scores in their test career over the last 10 years:
- | | Sachin | Dravid |
|------------------------|--------|--------|
| Average runs scored by | 58.5 | 54.2 |
| S.D. of run | 5 | 3 |
- Which batsman appears to be more consistent?
- d) Write down two merits and demerits of geometric mean?
- e) If the lines of regression of y on x and x on y are $3x + 2y = 26$ and $6x + y = 31$ respectively, find the correlation coefficient between x and y .
- f) Write down the Necessity and Advantages of Sampling.
- g) Distinguish between a 'Parameter' and 'Statistic'
- h) State Central Limit theorem.

- i) What is scatter diagram?
- j) Let T_1 and T_2 be two unbiased estimators of the parameter θ . Under what condition a $T_1 + bT_2$ will be an unbiased estimator of θ ?
- k) The variance of 20 observations is 5. If each observation is multiplied by 2, find the variance of the resulting observations.
- l) What will be the standard deviation of the following set of numbers: 5, 10, 14, 30, 21 ?
- m) Find mode of the binomial distribution in the following case $n = 9$, $p = 1/2$.
- n) The probability that a poisson variate x takes a positive value is $(1 - e^{-3})$. Find the probability that x lies between -2.5 and 2.5.
- o) The values of a variable are 5, 4, 9, 10, 3, 6, 2. Find their median.

3. Write down in brief any **four** of the following:

$$5 \times 4 = 20$$

- a) For a group of 200 candidates, the mean and standard deviations of scores were found to be 40 and 15 respectively. Later on it was discovered that the score of 43 and 35 were misread as 34 and 53 respectively Find the correct mean and standard deviation.
- b) What is Data Governance? Write down the benefits of Data Governance.
- c) The mean and the variance calculated from a group of 80 observations are 63.2 and 25.93 respectively. If 60 of these observations have mean 64.8 and S.D. 4, find the mean and S.D. of the remaining 20 observations.
- d) 'The correlation coefficient between two variables lies between -1 and 1' — prove it.

e) A class of 40 students did a survey of their favourite cartoon movies. The results recorded were as follows:

Cartoon Movies	Frequency
Finding Nemo	8
Dumbo	10
Melody Time	4
Cinderella	5
Ice Age	7
Chicken Littlo	6
Total	40

What is the cumulative relative frequency for chicken little?

f) Find the median from the following table:

Class:	0-20	20-40	40-60	60-80	80-100
Frequency:	8	15	6	7	5
