

**M.Sc. ENVIRONMENTAL SCIENCE
THIRD SEMESTER
STATISTICAL TECHNIQUES
MEV-302**

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

(PART-A : Objective)

Time : 20 min.

Marks : 20

Choose the correct answer from the following:

1×20=20

1. The coefficient of variation of a data set is 25%, the arithmetic mean is 16. What is the value of standard deviation?
a. 4
b. 8
c. 6
d. 5
2. The correlation of intelligence among the two groups of students could be measured using:
a. Line graph
b. Bar graph
c. Rank correlation
d. None of the above
3. Let the coefficient of determination computed to be 0.39 in a problem involving one independent variable and one dependent variable. This result means that:
a. The relationship between two variables is negative.
b. The correlation coefficient is also 0.39.
c. 39% of the total variation is explained by the independent variable.
d. 39% of the total variation is explained by the dependent variable.
4. A residual is defined as:
a. $Y - \hat{Y}$
b. Error sum of square
c. Type I Error
d. Regression sum of squares
5. If "time" is used as the independent variable in a simple linear regression analysis, then which of the following assumption could be violated?
a. There is a linear relationship between the independent and dependent variables.
b. The residual variation is the same for all fitted values of Y.
c. The residuals are normally distributed.
d. Successive observations of the dependent variable are uncorrelated.
6. If for a distribution difference of first quartile and median is greater than difference of median and third quartile then distribution is classified as:
a. Absolute open ended
b. Positively skewed
c. Negatively skewed
d. Not skewed at all
7. Considering mean, mode and skewness of data, value of skewness will be positive if:
a. mean < median
b. mean > median
c. mean > mode
d. mean < mode
8. In kurtosis, frequency curve that has flatten top than normal curve of bell shaped distribution is classified as:
a. Leptokurtic
b. Platykurtic
c. Megacurve
d. Mesokurtic

9. In kurtosis, beta is less than three and median is preferred as central tendency for:
- Leptokurtic distribution
 - Platykurtic distribution
 - Mesokurtic distribution
 - Mega curve distribution
10. Which one of the following indicates a linear relationship?
- $Y = a + bX$
 - $Y = abX$
 - $\bar{Y} \approx aX^b$
 - $Y = a + X^b$
11. For what kind of dataset Spearman's rank correlation can be applied?
- Nominal
 - Ordinal
 - Interval
 - Ratio
12. What is range of values of the coefficient of correlation?
- 100 to 100
 - 0 to -1
 - 1 to 1
 - 0 to 1
13. Which one of the following is discrete variable?
- Age of the people
 - Temperature in a room
 - Moisture content in air
 - Number of students in a class
14. Every alternate household in a locality is selected as sample, this kind of sampling process is known as:
- Random
 - Systematic
 - Snow ball
 - Stratified
15. What is the meaning of the word 'universe' in statistics?
- Whole set of observation
 - A collection of data
 - Partial set of observation
 - A collection of stars
16. Which one of the following is a relative measure of dispersion?
- Standard Deviation
 - Mean Deviation
 - Coefficient of Variation
 - Semi-inter-quartile range
17. One of the applications of clustering technique is:
- Remote Sensing Image Classification
 - Image enhancement
 - Quality control
 - Data reduction
18. The constants for multiple regression equation can be estimated by using:
- Co-ordinate Geometry
 - Trigonometry
 - Linear Algebra
 - Mathematics
19. If coefficient of correlation is 0.9, the coefficient determination will be:
- 0.99
 - 0.89
 - 0.81
 - 81
20. What is probability of occurring head only while tossing a coin for one occasion?
- 0.25
 - 0.75
 - 1.00
 - 0.50

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(PART-B : Descriptive)

Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

- Describe the measures of dispersion. What is their importance in research? 10
- What are the properties of regression coefficient? 5+5=10
 - What is correlation coefficient?
- Define Chi Square test. 4+6=10
 - Give a brief note on Scatter diagram.
- Define regression. Set up the regression equation of Y on X from the given dataset: 2+8=10

X	Y
4.5	4.6
5.6	6.8
7.5	7.3
3.4	4.5
2.8	8.9
4.5	6.7
2.8	6.6
4.2	8.9
3.2	6.6
2.3	5.8
- Define Datum. Give a brief description of different kinds of data. 2+3=5
 - Describe 'Scales of measurement'. 5
- What are the measures of variation? Describe each in detail. 7+3=10
 - Why are they important in research studies?
- Describe tabular representation of data. 5
 - Describe graphical representation of data. 5
- What is multiple regression? Why it is useful in research? 2+3+5=10
 - Describe the major steps of setting up a multiple regression equation.

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