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BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Sc.(BT)-Hons-2020
Course Name – Biostatistics
Course Code - BBTD601A
(Semester VI)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Spatial autocorrelation is _____. Choose the correct option.

a) The error term pertaining to one household or firm is correlated with the error term of another household or firm through space

b) The dependent variable pertaining to one household or firm is correlated with the error term of another household or firm through space

c) The independent variable pertaining to one household or firm is correlated with the error term of another household or firm through space

d) Both The error term pertaining to one household or firm is correlated with the error term of another household or firm through space and The independent variable pertaining to one household or firm is correlated with the error term of another household or firm through space

(ii) The statistical properties of OLS estimators are _____. Choose the correct option.

a) Linearity, Unbiasedness, and minimum variance

b) Linearity and Unbiasedness

c) Unbiasedness, and minimum variance

d) Linearity and minimum variance

(iii) Define measure of central tendency includes the magnitude of scores

a) Mean

b) Mode

c) Median

d) Range

(iv) Identify which of the following is not a disadvantage of using mean?

a) It is affected by extreme values

b) It cannot be computed in grouped data with open-ended class intervals

c) It does not possess the desired algebraic property

d) None of the these

(v) Locus of the conditional mean of the dependent variable for the fixed values of the explanatory variable _____. Identify the correct option.

a) Indifference curve
b) Population regression curve
c) Production Possibility curve
d) None of these

(vi) To calculate the median, all the items of a series have to be arranged in _____. Select the correct option.

a) Ascending order
b) Descending order
c) Ascending or Descending order
d) None of the these

(vii) Sample regression function is the estimated version of the _____. Identify the correct option.

a) Estimated version of population regression function
b) Estimated version of population correlation function
c) Not an estimated version of population regression function
d) Both estimated version of population correlation function and not an estimated version of population regression function.

(viii) Mode refers to the value within a series that occurs _____ number of times. Select the correct answer:

a) Maximum
b) Infinite
c) Minimum
d) Zero

(ix) The chance of rejecting of a true hypothesis decreases when sample size is _____. Choose the correct option.

a) increases
b) decreases
c) constant
d) both increases and decreases

(x) Identify the full form of OLS.

a) Ordinary least square method
b) Ordinary least statistical method
c) Ordinary least sample method
d) Both ordinary least statistical method and ordinary least sample method

(xi) The values of extreme items do not influence the measure of central tendency for _____. Select the correct answer:

a) Mean
b) Range
c) Median
d) Mode

(xii) Identify the conditional mean of Y.

a) The expected value of Y for given values of the independent variables, X
b) The expected value of Y for given values of the independent variables, u
c) The expected value of Y for given values of the independent variables, Y
d) Both The expected value of Y for given values of the independent variables, u and The expected value of Y for given values of the independent variables, Y

(xiii) The number of independent values in a set of values is called_____. Choose the correct option.

a) test statistic
b) degrees of freedom
c) level of significance
d) level of confidence

(xiv) The coefficient of determination shows _____. Select the correct option.

a) Proportion of the variation in the dependent variable Y is explained by the independent variable X
b) Proportion of the variation in the dependent variable X is explained by the independent variable Y
c) Proportion of the variation in the dependent variable u is explained by the independent variable X
d) Both Proportion of the variation in the dependent variable Y is explained by the independent variable X and Proportion of the variation in the dependent variable u is explained by the independent variable X

(xv) When s.d. is known, the hypothesis about population mean is tested by_____.

Choose the correct option.

a) t-test
b) Z-test
c) F-test
d) chi-square

Group-B
(Short Answer Type Questions) 3 x 5=15

2. For a randomly chosen leap year, compute the probability of getting 53 Sundays (3)

3. Define primary data. (3)

4. Describe different methods of collecting secondary data briefly. (3)

5. The first three moments of distribution about the value 0 are 1, 16 and 40 respectively. Identify the skewness of the distribution. (3)

6. Evaluate the median of the following data: 1,3,5,4,6,7,6,6,3,4,5,6,8 (3)

OR

Evaluate first quartile and third quartile of the following data: 2, 3, 2, 3, 2, 5, 6, 5, 3, 4, 8, 3, 4, 6, 7, 6, 8, 8, 10 (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Describe different methods of collecting primary data. (5)

8. Describe different merits and demerits of arithmetic mean. (5)

9. Explain the difference between the p-value approach and the critical value approach in hypothesis testing. (5)

10. Explain one tailed and two tailed tests. (5)

11. Illustrate Bayes' theorem. (5)

12. According to study, the average revenue (from tea) per year of different tea-gardens in West Bengal is Normally distributed with mean of Rs. 5 (in thousands) and standard deviation of Rs. 2.5 (in thousands). 10 tea gardens are selected randomly and the following data of revenue (in Thousand Rs.) are obtained from the tea gardens 11,8,4,6,5,8,7,9,6,10. Evaluate the hypothesis at 5% level of significance if there is any difference in means in the average revenue (from tea) per year. (5)

OR

The purpose of a study by Luglie was to investigate the oral status of a group of patients diagnosed with thalassemia major (TM). One of the outcome measure s was the decayed, missing, filled teeth index (DMFT). In a sample of 18 patients, the mean DMFT index value was 10.3 with standard deviation of 7.3. Evaluate if this sufficient evidence to allow us to conclude that the mean DMFT index is greater than 9 in a population of similar subjects? Let $\alpha = 0.1$ (5)

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