BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Sc.(Ag)-Hons-2022
Course Name – Statistical Methods
Course Code - CC-BAG378(T)
(Semester III)

Full Marks : 50 **Time : 2:0 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 20=20

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

(i) Choose the correct property of a binomial experiment.

a) the experiment consists of a sequence of one trial
b) each outcome can not be referred to as a success or a failure
c) the probabilities of the two outcomes can not change from one trial to the next
d) the trials are not independent

(ii) Two dice are rolled and the numbers are added together. Compute the probability of the total being 12 is

a) 1/36
b) 1/18
c) 1/12
d) None of these

(iii) Two dice are rolled and the numbers are multiplied together. Compute the probability of the total being 5 is

a) 1/18
b) 1/12
c) 1/36
d) None of these

(iv) Variance of Binomial distribution (with sample size = n and probability of success = p) is _____. Compute the correct option.

a) np
b) np(1-p)
c) n/p
d) None of these

(v) A coin is tossed 5 times. Compute the probability that all five tosses show heads.

a) 0.03
b) 0.01
c) 0.07
d) None of these

(vi) A coin is tossed 5 times. Compute the probability that at least 2 tosses show heads.

a) 0.7811
b) 0.8125
c) 0.9999
d) None of these

(vii) Determine the appropriate graph to display marital status (Married, Unmarried, Divorced, widow)

a) Frequency polygon
b) Pie chart

c) Scatter plot d) Histogram

(viii) An urn A contains 2 white and 3 black chips, and another urn B contains 3 white and 4 black chips. One urn is selected at random, and a chip is drawn from it. If the chip drawn is found black, compute the probability that the urn chosen was A.

a) 20/41 b) 21/41
c) 19/41 d) None of these

(ix) The probability of any event is defined as the number of the favourable events divided by the number of the sample space. Sample space is defined as _____. Choose the correct option.

a) Even number of outcomes b) Odd number of out comes
c) All possible outcomes of an Experiment d) None of these

(x) The number of accidents in a city during 2010 is _____. Choose the correct option.

a) Discrete variable b) Continuous variable
c) Constant d) None of these

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

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

(xii) The most frequently occurring value of a data set is called the _____. Choose the correct option.

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

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

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

(xiv) The number of observations smaller than _____ is the same as the number of observations larger than it. Choose the correct answer:

a) Mean b) Mode
c) Median d) None of these

(xv) Choose the correct statement.

a) E(XY)=E(X).E(Y) if X and Y are independent b) X and Y are independent if E(XY)=E(X).E(Y)
c) Both the statements d) None of these

(xvi) Identify which of the following is not a measure of dispersion?

a) Variance b) Standard deviation
c) Mode d) Range

(xvii) _____ is used to find the skewness of a dataset graphically? Choose the correct answer:

a) Pie chart b) Bar diagram
c) Histogram d) Line diagram

(xviii) The number of cars in a road during the day is _____. Choose the correct option.

a) Discrete variable b) Continuous variable
c) Qualitative variable d) Constant

(xix) The correlation coefficient is used to determine _____. Choose the correct option.

a) A specific value of the y-variable given a specific value of the x-variable
b) A specific value of the x-variable given a specific value of the y-variable
c) The strength of the relationship between the x and y variables
d) None of These

(xx) In regression analysis, the variable that is being predicted is the _____. Choose the correct answer:

a) response, or dependent, variable b) independent variable

c) intervening variable d) is usually x

Group-B

(Short Answer Type Questions) 2.5 x 10=25

2. Explain discrete data with an example. (2.5)

3. Explain histogram with an example. (2.5)

4. Explain median with an example. (2.5)

5. An HIV test gives a positive result with probability 98% when the patient is indeed affected by HIV, while it gives a negative result with 99% probability when the patient is not affected by HIV. If a patient is drawn at random from a population in which 0.1% of individuals are affected by HIV and he is found positive, evaluate the probability that he is indeed affected by HIV? (2.5)

6. Explain the Karl Pearson correlation coefficient. (2.5)

7. Explain null and alternative hypothesis. (2.5)

8. Explain two-sided test with an example. (2.5)

9. Illustrate population and sample briefly. (2.5)

10. Illustrate different types of surveys. (2.5)

11. A problem is given to 5 students P, Q, R, S, T. If the probability of solving the problem individually is 1/2, 1/3, 2/3, 1/5, 1/6 respectively, evaluate the probability that the problem is solved. (2.5)

OR

Calculate the mean of Binomial distribution. (2.5)

Group-C

(Long Answer Type Questions) 5 x 1=5

12. A die is thrown 120 times. Denote the observed number of occurrences by O: 25, 17, 15, 23, 24, 16. Can we conclude that the die to be fair at the 5 per cent level of significance? (5)

OR

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 (5)

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.

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