BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – BBA(HM)-Hons-2023
Course Name – Fundamentals of Statistics
Course Code - BHM10001
(Semester I)

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) Identify the following statements about Type 1 error is true.

   a) It is also known as a false negative.
   b) It occurs when a true null hypothesis is accepted.
   c) It is unrelated to the significance level.
   d) It is not a concern in hypothesis testing.

(ii) Choose the correct option. In a criminal trial, an innocent person being wrongly convicted is an example of:

   a) Type I error
   b) Type II error
   c) Both Type I error and Type II error
   d) Neither Type I error nor Type II error

(iii) Choose the correct option. The probability of all possible outcomes of a random experiment is always equal to

   a) One
   b) Zero
   c) Infinity
   d) All of these

(iv) Select the correct option. If two variables oppose each other then the correlation will be

   a) Positive relationship
   b) Negative Relationship
   c) No relationship
   d) None of these

(v) Choose the correct option. A set of all possible outcomes of an experiment is called

   a) Combination
   b) Sample point
   c) Sample space
   d) Compound events

(vi) Select the correct option. The Coefficient of Correlation r is independent of

   a) Change of origin
   b) Scale of measurement
   c) Both change of origin and scale
   d) None of these

(vii) Select the definition of crude birth rate.

   a) The total number of births in a specific age group and location
   b) The number of births in a year per 1,000 people in the population.

c) The ratio of births in urban areas compared to rural areas.

d) The number of births caused by infectious diseases.

(viii) Identify the formula for Bayes' Theorem is:

a)

$$P(A|B) = P(B|A) * P(A) / P(B)$$

b)

$$P(A|B) = P(A) * P(B) / P(A \cap B)$$

c)

$$P(A|B) = P(B|A) * P(A) / P(B|A) + P(B|\neg A) * P(\neg A)$$

d)

$$P(A|B) = P(B|A) * P(A) + P(B|\neg A) * P(\neg A)$$

(ix) Select the correct option. The questionnaire survey method is used to collect

a) Secondary data

b) Primary data

c) Qualitative data

d) Quantitative data

(x) Identify which one is the cumulative frequency curve

a) Ogive

b) Histogram

c) Bar graph

d) Median

(xi) Select the correct option. The weights of students in a college/ school is a

a) Continuous variable

b) Discrete variable

c) Quantitative variable

d) None of these

(xii) Select the correct option. The grouped data is also called

a) Raw data

b) Primary data

c) Secondary data

d) Qualitative data

(xiii) Select the primary use of total fertility rate in a demography.

a) Analyzing infant mortality rate

b) Estimating life expectancy

c) Measuring the impact of immigration on population growth

d) Projecting future population trends

(xiv) Select the correct option. Two regression lines are parallel to each other if their slope is

a) Different

b) Same

c) Negative

d) None of these

(xv) Select the correct option. The best-fitting trend is one for which the sum of squares of error is

a) Zero

b) Minimum(least)

c) Maximum

d) None of these

Group-B
(Short Answer Type Questions)

3 x 5=15

2. Define variance and standard deviation (3)

3. Explain the concept of simple linear regression (3)

4. Explain the concept of Karl Pearson's coefficient of correlation. (3)

5. Discuss what does high crude birth rate typically indicate about the population. (3)

6. Explain the concept of a t-test in statistics. (3)

OR

Explain Type I error? Example (3)

Group-C
(Long Answer Type Questions)

5 x 6=30

7. Predict the correlation coefficient: (5)

x	10	12	13	16	17	20	25
y	19	22	24	27	29	33	37

8. The following frequency table is given below: (5)

Class	1-2	2-3	3-4	4-5	5-6	6-7
Frequency	17	14	2	10	15	10

Predict the mode of the frequency distribution.

9. Explain simple and composite hypotheses briefly with examples. (5)

10. (5)

The following frequency table shows the pulse rate (in bpm) of 120 patients in a hospital:

Pulse rate	50-60	60-70	70-80	80-90	90-100
Frequency	?	36	28	?	2

Predict the average pulse rate of the patients is 70 bpm and calculate the unknown frequencies.

11. In a neighbourhood, 90% children were falling sick due flu and 10% due to measles and no other disease. The probability of observing rashes for measles is 0.95 and for flu is 0.08. If a child develops rashes, calculate the child's probability of having flu. (5)

12. Predict the value of the correlation coefficient from the data given in the following table: (5)

| x | 43 | 21 | 25 | 42 | 57 | 59 |
| y | 99 | 65 | 79 | 75 | 87 | 81 |

OR

Predict the spearman's correlation coefficient (5)

| x | 5 | 6 | 8 | 9 | 12 |
| y | 6 | 8 | 16 | 9 | 19 |

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