BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – BBA(HM)-Hons-2024
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) If the mean of frequency distribution is 6.5 and $\sum fi\ xi = 120 + 2k$, $\sum fi = 20$, select k is equal to:

a) 10 b) 5
c) 25 d) 15

(ii) Line diagram is used to represent _____ type of data. Select the correct option.

a) Time Series Data b) Spatial Series data
c) Frequency Type data d) None of these

(iii) Select the median of the data 11,12, 14, 17, 20, and 27, from the following options :

a) 30/2 b) 31/2
c) 33/2 d) 35/2

(iv) Select the correct option. In Correlation both variables are always

a) Random b) Non-Random
c) Same d) None of these

(v) Select the correct option . A correlation coefficient of +0.85 indicates:

a) A strong positive linear relationship b) A weak positive linear relationship
c) No relationship between variables d) A strong negative relationship

(vi) Select the correct option . The difference between simple linear regression and multiple regression is that

a) Simple linear regression involves only one independent variable, while multiple regression involves two or more b) Simple linear regression is more accurate than multiple regression
c) Multiple regression can only be applied to large datasets d) Simple linear regression cannot be used for prediction.

(vii) Select the scenario you should expect the total fertility rate to decrease significantly.

a) Improved access to education and employment opportunities for women b) An increase in maternal healthcare services
c) A decrease in the average age of marriage d) A rise in the overall population growth rate

(viii) In a country with a Total fertility rate of 2.5 , state the interpretation of this number in terms of average children per woman.

a) 2.5 children b) 2 children
c) 2.5 children per year d) 2.5 children per 1000 women

(ix) Describe the formula of qx

a) lx/dx b) dx/lx
c) lxdx d) None of these

(x) Choose the correct option. Three unbiased coins are tossed. Evaluate the probability of getting at most two heads.

a) 3/4 b) 3/8
c) 7/4 d) 7/8

(xi) Choose the correct option. Probability lies between

a) -1 and +1 b) 0 and 1
c) 0 and n d) 0 and ∞

(xii) Two dice are rolled. Identify the correct option, the probability of getting a sum of 7 or 11.

a) 2/9 b) 4/9
c) 1/16 d) 2/36

(xiii) Identify a Type 1 error in hypothesis testing.

a) Rejecting a true null hypothesis b) Accepting a true null hypothesis
c) Rejecting a false null hypothesis d) Accepting a false null hypothesis

(xiv) A researcher sets the significance level at 0.05. Identify this mean in terms of Type 1 error

a) There is a 5% chance of making a Type 1 error. b) There is a 5% chance of making a Type 2 error
c) There is a 95% chance of making a Type 1 error d) There is a 95% chance of making a Type 2 error

(xv) Identify the formula to calculate the Z-score in a Z-test is:

a) (sample mean - population mean) / sample standard deviation
b) (sample mean - population mean) / population standard deviation
c) (sample mean - population mean) / sample error of the mean
d) (sample mean - population mean) / sample size

Group-B

(Short Answer Type Questions) 3 x 5=15

2. If two lines of regression are x+4y+1=0 and 4x+9y+7=0 then what is the value of y when x=-3. (3)

3. A fair coin is tossed twice such that E: event of having both head and tail, and F: event of having at most one tail. Estimate P(E), P(F) and P(E|F) (3)

4. Represent the sales (monthly) of Maruti cars for 1990 of park Motor Co. in India in a line chart from given data: (3)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No car sold	175	185	160	110	120	80	85	88	120	110	155	170

5. Define Standardised death rate. (3)

6. A random sample of size 20 from a Normal population gives a sample mean 42 and sample standard deviation 6.estimate the value of test statistics if the population mean is 44 using appropriate test statistics. (3)

OR

You represent a chemical company that is being sued for paint damage to automobiles. You want to support the claim that the mean repair cost per automobile is not $650. Explain the null and alternative hypotheses. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

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

Class	1-2	2-3	3-4	4-5	5-6	6-7
Frequency	12	14	15	10	8	9

Predict the mean of the frequency distribution.

8. Predict the value of correlation coefficient. (5)

x	1	2	3	4	5
y	6	8	11	9	12

9. A life table for a certain country shows that out of 100,000 live births, 80,000 survive to age 1, 70,000 survive to age 5, and 50,000 survive to age 70. Assuming a simple life table with uniform mortality between intervals, estimate the life expectancy at birth. (5)

10. You toss a fair coin three times: (5)
I)Calculate the probability of three heads, HHH.
II)Calculate the probability that you observe exactly one heads.
III)Given that you have observed at least one heads, calculate the probability that you observe at least two heads.

11. Explain in detail about the null hypothesis and alternative hypothesis. (5)

12. Given two variables X and Y, calculate the correlation coefficient between them using the Pearson correlation formula. (5)

X	3	2	-1	0	1	2	3
Y	9	4	1	0	1	4	9

OR

The correlation coefficient of a set of data is found to be 0.8. The standard deviation of data set x (σ_x) = 1, and the standard deviation of data set y (σ_y) = 1.4. Predict the covariance of the data. (5)

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