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BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – BBA(HM)-Hons-2024/BBA(HM)-Hons-2025
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 ∑fi xi = 120 + 2k, ∑fi = 20, select k is equal to:

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

(ii) 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

(iii) Select from the following options what does the crude death rate not take into account.

a) Age distribution of the population b) Number of births in a year
c) Leading causes of death d) Gender distribution of the population

(iv) Select from the options what is the formula to calculate Crude death rate

a) (Number of deaths in a year / Total population) x 100 b) (Number of births in a year / Total population) x 100
c) Number of deaths in a year / Number of births in a year) x 100 d) (Number of deaths in a year / Number of households) x 100

(v) Select in which scenario would you expect the crude death rate to increase significantly

a) Improved healthcare facilities and access to medical services b) An increase in the average life expectancy
c) A decrease in the prevalence of infectious disease d) A natural disaster that affects a large population

(vi) Choose the correct option. When two coins are tossed simultaneously, evaluate the chances of getting at least one tail.

a) 3/4 b) 1/4
c) 1/2 d) 1

(vii) Choose the correct option. Bag contain 10 back and 20 white balls, One ball is drawn at random. Evaluate the probability that ball is white

a) 1 b) 1/3
c) 2/3 d) 0

(viii) 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.

(ix) Choose the correct option. Type 2 error denoted by

a) Alpha (α) b) Beta (β)
c) Delta (δ) d) Gamma (γ)

(x) 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

(xi) Choose the correct option. The Z-score in a Z-test follows which probability distribution

a) Normal distribution
b) T-distribution
c) F-distribution
d) Chi-square distribution

(xii) Select the correct option. Positive correlation shows:

a) One rises, other falls
b) One falls, other constant
c) Both rise or fall together
d) Both stay constant

(xiii) Select the correct option. Regression line predicts:

a) Standard deviation
b) Sample size
c) Future values
d) Frequency

(xiv) Select the correct option. Total probability of all events equals:

a) 0
b) 1
c) 2
d) 3

(xv) Select the correct option. Conditional probability relies on:

a) Fixed outcome
b) Sample mean
c) Given event
d) Multiple trials

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Group-B

(Short Answer Type Questions) 3 x 5=15

2. Calculate the arithmetic mean for the values (3)

Wages in Rs.	10-20	20-30	30-40	40-50	50-60	60-70
No. of person	5	10	30	20	15	10

3. Define Crude Birth Rate (CBR). (3)

4. $\sum x = 52$ $\sum x^2 = 380$ $\sum xy = 1335$ (3)
$\sum y = 225$ $\sum y^2 = 7007$ $n = 8$

Estimate correlation coefficient.

5. A four-digit number is formed by the digits 1, 2, 3, 4 with no repetition, illustrate the probability that the number is (i) odd, (ii) divisible bv 4. (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. Examine the linear regression equation of Y on X for the data (5)

x	1	3	4	6	8	9	11	14
y	1	2	4	4	5	7	8	9

8. Describe about ogives in details with diagrams and examples (5)

9. Given the following incomplete life table: (5)

Age (x)	l_x (Number Alive at Age x)	T_x(Total Person-Years Lived Above Age x)	e_x (Life Expectancy at Age x)
50	100,000	?	20.5
51	98,000	2,000,000	?

a) Estimate the missing T_{50} (Total person-years lived above age 50).
b) Estimate the missing e_{51}(Life expectancy at age 51).

10. A store contains 35 light green parakeets (14 females and 21 males) and 44 sky blue parakeets (28 females and 16 males). You randomly choose 1 of the parakeets. Calculate the probability that it is a female or sky-blue parakeet. (5)

11. A sample of nine plastic nuts yielded an average diameter of 3.1 cm with sample standard deviation of 1.0 cm. It is assumed from design and manufacturing requirements that the population mean of nuts is 4.0 cm. Evaluate the mean diameter of plastic nuts being produced. (5)

12. 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)

OR

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

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