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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – M.Sc.(MATH)-2025

Course Name – R Programming and Python

Course Code - MSM27505 (T)

(Semester II)

Full Marks : 40

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 10=10

1. Choose the correct alternative from the following :

- (i) Select the characteristic of a matrix in R.
 - a) All elements are of the same type
 - b) Elements can be of mixed types
 - c) Can contain key-value pairs
 - d) Cannot be indexed
- (ii) Select the default file extension for Python scripts.
 - a) .txt
 - b) .py
 - c) .r
 - d) .exe
- (iii) Select the term describing negative skewness.
 - a) Left-tailed distribution
 - b) Right-tailed distribution
 - c) J-shaped distribution
 - d) Bimodal distribution
- (iv) Select the type of correlation where both variables increase together.
 - a) Negative correlation
 - b) Zero correlation
 - c) Positive correlation
 - d) Curvilinear relation
- (v) Select the property of coefficient of variation enabling comparison of variability in different units.
 - a) Absolute measure
 - b) Relative measure
 - c) Unit-dependent value
 - d) Non-standardized number
- (vi) Select the peakness type when kurtosis exceeds normal distribution.
 - a) Leptokurtic
 - b) Platykurtic
 - c) Mesokurtic
 - d) Symmetric
- (vii) Select the name given to the simplest form of ANOVA.
 - a) Two way ANOVA
 - b) Mann-Whitney test
 - c) One way ANOVA
 - d) Paired t test
- (viii) Choose the term describing a line best fitting observed data in regression.
 - a) Regression line
 - b) Frequency curve
 - c) Dendrogram
 - d) Control limit
- (ix) Select the option that best fits regression.

- a) Supervised learning
 - b) Unsupervised learning
 - c) Both supervised and unsupervised learning
 - d) None of these
- (x) Select the basic concept describing a variable whose outcomes are numerical results of a random process.
- a) Deterministic function
 - b) Random variable
 - c) Constant measure
 - d) Fixed parameter

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Classify common types of control structures used in R and Python. (3)
- 3. Summarize the coefficient of variation and its usefulness in comparing variability among datasets. (3)
- 4. Explain p-value. (3)
- 5. Explain the simple linear regression model and the assumptions associated with it. (3)
- 6. Write the conditions under which the binomial distribution is applicable. (3)

OR

Write the definition of the Poisson distribution and one situation where it is commonly used. (3)

Group-C

(Long Answer Type Questions)

5 x 3=15

- 7. An observation has likelihood 0.04 under population 1 and 0.02 under population 2. Assuming equal prior probabilities, classify the observation. (5)
- 8. Enumerate the mean, median and range of the following observations: 12, 15, 18, 20, 25 and state the corresponding functions in R or Python. (5)
- 9. Write the role and significance of an Integrated Development Environment in statistical computing. (5)

OR

Write the concept of data frames and their suitability for real-world statistical datasets. (5)

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