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**BRAINWARE UNIVERSITY**

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Term End Examination 2025-2026**Programme – M.Sc.(ND)-2025****Course Name – Biostatistics****Course Code - MND27504 (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 scale of measurement applicable to ranking nutritional status as underweight, normal, and overweight.
 - a) Nominal scale
 - b) Ordinal scale
 - c) Interval scale
 - d) Ratio scale
- (ii) Select ungrouped data representation.
 - a) Histogram
 - b) Frequency curve
 - c) Individual values without class intervals
 - d) Cumulative frequency table
- (iii) Select the relationship among mean, median, and mode in a positively skewed distribution.
 - a) Mean < Median < Mode
 - b) Mean > Median > Mode
 - c) Mean = Median = Mode
 - d) Mode > Mean > Median
- (iv) Select the concept describing the degree of peakedness of a distribution.
 - a) Skewness
 - b) Dispersion
 - c) Kurtosis
 - d) Variance
- (v) Select the descriptive statistic used to compare variability of nutrient intake across populations.
 - a) Median
 - b) Mode
 - c) Coefficient of variation
 - d) Skewness
- (vi) Select the effect of change of origin on correlation coefficient.
 - a) Value increases
 - b) Value decreases
 - c) No change
 - d) Becomes zero
- (vii) Choose the collection of all possible outcomes of a random experiment.
 - a) Event
 - b) Trial
 - c) Sample space
 - d) Outcome
- (viii) Select the statement that represents the alternative hypothesis.
 - a) Statement of no difference
 - b) Statement contradicting the null hypothesis

- c) Assumed true initially d) Probability statement
- (ix) Select the error committed when a true null hypothesis is rejected.
- a) Type II error b) Type I error
- c) Sampling error d) Non-sampling error
- (x) Select the situation favouring use of non-parametric tests.
- a) Large sample size b) Skewed or ordinal data
- c) Known variance d) Normal population

Group-B

(Short Answer Type Questions)

 $3 \times 5 = 15$

2. Describe bar diagram and multiple bar diagram. (3)
3. Explain kurtosis and the types of kurtic distributions. (3)
4. Explain scatter diagram and state one use in food and nutrition studies. (3)
5. Define mutually exclusive events with a food-related example. (3)
6. Summarize Type II error in hypothesis testing. (3)

OR

Summarize the application of the Wilcoxon signed rank test as a non-parametric alternative (3) to the paired t-test in nutrition experiments.

Group-C

(Long Answer Type Questions)

$$5 \times 3 = 15$$

7. For 5 individuals, the following values are given:
 $\sum X = 25, \sum Y = 30, \sum XY = 160, \sum X^2 = 135, \sum Y^2 = 190, n = 5$
 Compute the correlation coefficient between X (daily calorie intake in 100 kcal)
 and Y (body weight in kg). (5)

8. The haemoglobin levels in g/dL of eight adolescent girls are 10.2, 11.5, 12.0, 10.8, 11.5, 9.8, 10.2, 11.5. Calculate the mean, median and mode. (5)
9. The average calcium intake of a population is claimed to be 800 mg with a known standard deviation of 100 mg. A sample of 50 individuals shows a mean intake of 770 mg. Test the claim at 5% level of significance. The critical value is 1.96. (5)

OR

The standard mean BMI of adults is 23 kg/m-square with population standard deviation 3 kg/m-square. A sample of 36 adults shows a mean BMI of 24 kg/m-square. Test whether there is a significant difference at 5% level of significance. The critical value is 1.96. (5)

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