BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Sc.(PSY)-Hons-2023
Course Name – Statistics in Psychology
Course Code - BPY20105
(Semester II)

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) Select the measure of variability that indicates the spread or dispersion of scores around the mean.

a) Median b) Mode
c) Range d) Standard Deviation

(ii) Choose the example that represents an ordinal scale measurement in psychology:

a) Height of participants in centimeters b) Frequency of exercise sessions per week
c) Likert scale responses ranging from "strongly disagree" to "strongly agree" d) Order of finishing in a race

(iii) Identify the term that represents the point below which a certain percentage of scores fall in a frequency distribution, indicating the relative standing of an individual within a group:

a) Mean b) Median
c) Percentile d) Mode

(iv) Identify the error that occurs when a null hypothesis is incorrectly rejected when it is actually true:

a) Type I error b) Type II error
c) None of these d) Both Type I & Type II error

(v) Identify the error that is also known as a "false negative" in statistical hypothesis testing:

a) Type I error b) Type II error
c) None of these d) Both Type I & Type II error

(vi) Identify the error that can have practical consequences, such as making incorrect decisions in clinical trials or psychology experiments:

a) Type I error b) Type II error

c) None of these
d) Both Type I & Type II error

(vii) Identify the appropriate approach for determining the median in psychology:

a) Summing up all the scores and dividing by the number of scores
b) Choosing the score that occurs most frequently in the dataset
c) Selecting the score that falls exactly in the middle when the scores are ordered
d) Calculating the average of the highest and lowest scores in the dataset

(viii) Identify the appropriate step to calculate the mode in a set of psychological data:

a) Calculate the mean and median, then select the highest value
b) Count the frequency of each score and identify the score with the highest frequency
c) Determine the range of the data and select the most common value within that range
d) Sort the data from lowest to highest and select the value in the middle

(ix) Select the correct statement about raw scores in statistics in psychology:

a) Raw scores are always transformed into standardized scores before analysis
b) Raw scores represent the original, unprocessed data collected in a study
c) Raw scores are only used in descriptive statistics and not in inferential statistics
d) Raw scores are synonymous with z-scores in psychological research

(x) Select the correct statement regarding z-scores:

a) Higher z-scores indicate a raw score is below the mean.
b) A z-score of 0 indicates that the raw score is at the mean.
c) Negative z-scores indicate that a raw score is above the mean.
d) Z-scores are not related to raw scores.

(xi) Select the statement that accurately describes the relationship between z-scores and raw scores:

a) Raw scores are always positive, whereas z-scores can be negative.
b) Z-scores represent the raw score's distance from the median.
c) Raw scores are standardized using z-scores.
d) Z-scores are always positive, whereas raw scores can be negative.

(xii) Identify the characteristic of skewness in a statistical curve where the tail extends towards the left side of the distribution, indicating a majority of data points on the right side of the mean?

a) Negative skewness
b) Positive skewness
c) Symmetrical distribution
d) Normal distribution

(xiii) Identify the correlation coefficient that indicates a perfect positive relationship between two variables in statistics within psychology.

a) 0
b) -1
c) 1
d) 0.5

(xiv) Select the correlation coefficient that demonstrates a weak positive relationship between two variables in psychology statistics.

a) -0.7
b) 0.1
c) -0.4
d) -0.2

(xv) Select the correct statement regarding a correlation coefficient of -0.70.

a) There is a weak positive relationship between the variables.
b) There is a strong positive relationship between the variables.
c) There is a weak negative relationship between the variables.
d) There is a strong negative relationship between the variables.

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe the ordinal scale of measurement. (3)
3. Define Median & compute the median for the following reflex knee jerk strengths (in degrees of arc) of a sample of athletes: 19, 21, 22, 26, 28, 30, 31, 35, 35, 37. (3)

4. Explain the type I error with example. (3)
5. Differentiate between Product-Moment correlation and Spearman's rank correlation. (3)
6. Given mean= 49.5 and SD= 14.3 for a distribution, calculate to change the scores of 80 and 70 into z or sigma scores.Given mean= 49.5 and SD= 14.3 for a distribution, calculate to change the scores of 80 and 70 into z or sigma scores. (3)

OR

Given Mean= 48, SD= 8 for a distribution, calculate to convert a z score of the value 0.625 into a raw score. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Compute Pearson's r to express whether or not there is a significant correlation between height (cm) and weight (kg) in the following data from 9 college students. Height: 165, 182, 170, 162, 160, 165, 170, 170, 165. Weight: 58.5, 60.0, 52.0, 48.5, 49.5, 59.0, 49.0, 56.0, 58.0 respectively. (5)

8. Define the following along with diagrams: Negative skewness, Positive skewness, Normal curve. (5)

9. Calculate the median of the following grouped data: Scores= 65-69, 60-64, 55-59, 50-54, 45-49, 40-44, 35-39, 30-34, 25-29, 20-24. Frequency= 1, 3, 4, 7, 9, 11, 8, 4, 2, 1 respectively. (5)

10. Construct the observed frequency polygon of diastolic blood pressure (mm Hg) using the following diastolic BP scores in a sample- CI: 61-65, 66-70, 71-75, 76-80, 81-85, 86-90, 91-95, 96-100, 101-105. Frequencies: 2, 7, 12, 23, 40, 22, 15, 8, 1 respectively. (5)

11. Compute to estimate the SE of the mean hemoglobin concentration (g/dl) of the following data in a stratified sample from a population divided on the basis of sex. Men= 14.2, 14.6, 14.8, 14.0, 13.7, 14.8, 14.6, 13.8, 14.0, 14.9, 15.0. Women= 12.4, 12.8, 12.6, 13.1, 12.5, 12.9, 13.4, 14.2, 12.9, 12.2. (5)

12. Explain applications of the normal curve. (5)

OR

Explain how normal curve can be used for converting raw scores into comparable standard normalized scores? (5)