



## BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – M.Optomtry-2024

Course Name – Fundamentals of Research and Intellectual Property Rights

Course Code - MOP10104

( 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) First step of an investigation is \_\_\_\_\_.
  - a) presentation of data
  - b) collection of data
  - c) analysis of data
  - d) explanation of data
- (ii) Skewness is positive when mean is \_\_\_\_\_.
  - a) negative
  - b) less than mode
  - c) equal to mode
  - d) greater than mode
- (iii) A grouped distribution can be represented by \_\_\_\_\_.
  - a) Frequency polygon
  - b) Ogives
  - c) Frequency curve
  - d) Histogram
- (iv) The mode of the series 3,5,8,5,4,5,9,3 is \_\_\_\_\_.
  - a) 3
  - b) 5
  - c) 4
  - d) 8
- (v) Skewness is positive when mean is \_\_\_\_\_.
  - a) Less than mode
  - b) Greater than mode
  - c) Equal to mode
  - d) Negative
- (vi) The regression lines evaluate the \_\_\_\_\_.
  - a) Average of x and y
  - b) Average of x only
  - c) Average of y only
  - d) median of x and y
- (vii) \_\_\_\_\_ is used to compare the variability of two or more than two series.
  - a) Mean
  - b) Standard deviation
  - c) Mean deviation
  - d) Coefficient of variation
- (viii) The spearman rank correlation coefficient is a \_\_\_\_\_ measure of rank correlation.
  - a) Parametric
  - b) Non-parametric
  - c) Linear
  - d) Non-linear

- (ix) Which of the following is NOT a type of research design?  
 a) Descriptive  
 b) Experimental  
 c) Subjective  
 d) Predictive
- (x) What does a longitudinal research design involve?  
 a) Studying a single group over an extended period  
 b) Studying a single group at one point in time  
 c) Studying multiple groups at one point in time  
 d) Studying multiple groups over an extended period
- (xi) Which of the following is a qualitative research design method?  
 a) Survey  
 b) Case study  
 c) Experiment  
 d) Observational study
- (xii) Evaluate a non-probability sampling method from the following.  
 a) Convenience sampling.  
 b) Simple random sampling.  
 c) Stratified sampling.  
 d) Systematic sampling.
- (xiii) Evaluate a confounding variable in research design.  
 a) A variable that affects both the independent and dependent variables  
 b) A variable that is measured  
 c) A variable that is controlled  
 d) A variable that is manipulated
- (xiv) Analyze the key difference between qualitative and quantitative research designs.  
 a) Qualitative research is experimental, while quantitative research is observational.  
 b) Qualitative research focuses on numbers, while quantitative research focuses on words.  
 c) Qualitative research uses words and descriptions, while quantitative research uses numbers and statistics.  
 d) Qualitative research is always conducted in a laboratory setting, while quantitative research is field-based.
- (xv) Evaluate the reason for using a parametric test instead of a non-parametric test when data meets certain criteria.  
 a) Parametric tests are simpler to compute  
 b) Parametric tests are more powerful when assumptions are met  
 c) Non-parametric tests require larger sample sizes  
 d) Parametric tests do not require assumptions

**Group-B**  
(Short Answer Type Questions)

3 x 5=15

2. Define qualitative research. (3)
3. In a study evaluating the impact of two teaching methods on exam scores, you find a p-value of 0.07 in an independent t-test. How would you interpret this result? (3)
4. After conducting a one-way ANOVA, you obtain a significant result. Explain how you would determine which group means differ from each other and the role of post-hoc tests. (3)
5. What are the software tools can be used to perform a comparison of proportions? (3)
6. Explain how you would develop an idea of using a paired samples t-test to compare pre- and post-treatment scores for anxiety levels in a clinical trial and what a significant result indicates. (3)

OR

Discuss how you develop and idea to perform a two-way ANOVA to examine the effects of diet and exercise on weight loss, and what interaction effect means in this context. (3)

**Group-C**  
(Long Answer Type Questions)

5 x 6=30

7. Explain the potential consequences of conducting ANOVA without checking for its assumptions, and how can researchers mitigate these issues? (5)
8. Describe the role of the p-value in hypothesis testing and also write the indication of a small p-value. (5)
9. Investigate the role of intellectual property rights in the development of ophthalmic drugs and devices. How do patents influence innovation, pricing, and accessibility of treatments for eye diseases, particularly in low-income countries? (5)
10. Explain the key components of research proposal. (5)
11. Critically Analyze the fundamental distinctions between qualitative and quantitative research designs. (5)
12. Analyze the concept of randomization to enhance the validity and reliability of experimental design. (5)

**OR**

Analyze the concepts of Type I and Type II errors in hypothesis testing, explaining their significance in statistical inference and their potential impact on the conclusions drawn from experimental data. (5)

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