MASTER OF PHYSIOTHERAPY (CARDIOPULMONARY) SEMESTER I

Paper: MPT-01

Research Methodology & Biostatistics

Max Marks: 100

Theory: 75

Time: 3 hrs   **Internal Assessment:**

25

Note :

Section A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The questions should be equally distributed in whole syllabus.

Section B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

Description:

Research in physiotherapy: Introduction, Need for Research in Physical Therapy, Research Definition, Concepts, Purpose and Significance, Types of Research, Ethical issues in Research.

Research Design: Meaning, Need, Features and Various concepts relating to research design, Types of research design, research Approaches: Quantitative and Qualitative- assumptions and problems, Experimental design: Basic principles of experimental research designs, single system and group or Multiple factor design- Problems, Characteristics and limitations, Non Experimental design: Survey research-Scope, types & Implementation. Clinical case reports, Qualitative Research designs & methods

Research Process: Research problems, Questions and Hypothesis, Various steps involved in Research process, criteria of good research and problems encountered by researchers.

Measurement of Scaling techniques: Measurement in Research- Definition, Various Scales, Errors in Measurement and Scaling Technique, Reliability and validity in research.

Methods of Data Collection: Types of Data sources- Primary and secondary. Collection of Primary data (Observation and Oral Interview method, Questionnaire, Schedules); Collection of secondary data (published and unpublished sources)

Statistical Reasoning, Processing & Analysis: Introduction to Data set, Frequency Distribution, Central tendency, Variability in Distribution, Measures of Asymmetry (Skewness), Measures of Relationship, Correlation-Simple, Partial and Multiple. Regression - Simple and Multiple.

Sampling Fundamentals: Basic concepts, Need of sampling, Sample design- Steps in Sample Design, Characteristics of Good Sample Design, Types of Sampling.

Sampling Theory: Principles of Sampling, Sampling and Non Sampling Errors, Theory of Estimation, Sampling Distributions, Central limit theorem, Sample size & its determination.

Measures of Central Tendency and Dispersion- Arithmetic mean, median, mode and standard deviation (application).

Correlation and Regression: Karl Pearson's correlation method, Rank correlation method, Regression Equation and their coefficients (numerical)

Hypothesis Testing: Null Hypothesis, Alternative Hypothesis, Acceptance and Rejection Region, Level of Significance, Type I & II errors, Hypothesis Testing for Means, Sample Proportions and Variances, Chi-Square Test for comparing variances, Conditions and steps involved in applying Chi-Square Test, Analysis of Variance (ANOVA)- Basic Principles Techniques, Coding Method, Two way ANOVA and Analysis of Covariance (ANCOVA); Importance and characteristics of Non Parametric or Distribution- Free Tests.

Parametric and Non-Parametric Tests (Simple Applications): Z-test, t-test, F-test, chi-square test, ANOVA (One way and two way), ANCOVA, Spearman's rank Correlation and Kendall's Coefficient of Concordance.

Multivariate Analysis Techniques: Characteristics, Classifications and Variables in Multivariate Analysis, Techniques of Factor Analysis.

Writing an Research Proposal, Critiquing a Research Article: Defining a problem, Locating the Literature, Types of Literature, Evaluating Literature- Evaluating Single Studies and Review Articles, Elements of Research article- Inclusion and Exclusion Criteria, Funding, Data Collection & Analysis, Results, Interpretation, Conclusion, Discussions.

Interpretation and Report writing: Meaning, Techniques, Precautions, Significance, Steps and Types

Publication and Presentation of Research

BOOKS RECOMMENDED:

1. Cooper D.R and Schindler, P.S., Business Research Method, Tata McGraw Hill Publishing Co.
2. Carolyn. M.Hicks, Research for Physiotherapists, Project Design and Analysis, Elsevier Health Sciences, Second Edition.
3. C.R Kothari. Research Methodology-Methods and Techniques, New age International Limited, Publishers, Second Edition.