

# Ph.D Pre Qualifying Examination Course Work

Subject : ECONOMICS

## RESEARCH METHODOLOGY AND DATA ANALYSIS

### Module 1: Research Methodology

Concept of Scientific Research-Characteristics of Social Science Research-Types of research: Pure and Applied Research, Descriptive research, Diagnostic Research, Explorative research and Action research.

Formulation of research problem-Reviewing the literature-Identification of Research problems-Setting of Research question, objectives, Methodology and Data Source. Setting of hypotheses. Conceptualization in research: Working definitions, Defining concepts, Indicators and Variables. Concept of Falsification. Research report writing and presentations. References-Bibliography: MLA and APA formats.

Status of Social Science research in India. Plagiarism and its testing software: Viper and turnitin.

### Module II: Types of Data and Sampling Methods

Data Measurements: Nominal, Ordinal, Interval and Ratio scales. Types of Data: Qualitative versus quantitative data. Time series, Cross section and Panel data. Primary and Secondary data. Data Sources.

Different types of samples: random sample, stratified sample, multistage sample, cluster sample, systematic sample and snow ball sample. Methods of choosing optimum sample size.

### Module III: Basics Tools for Data Analysis

Review of basic statistical measures: Central tendency Dispersion and Skewness. Bivariate data analysis: Correlation, Regression, Multiple Correlation and Partial Correlation.

Random variables and Probability distributions: Discrete and continuous - Normal Distribution-Sampling Distributions, Standard Error- Chi-square, students t and F distributions. Theory of estimation -Point estimation : Desirable properties of estimators, methods of estimation, Interval estimation: Confidence interval for mean and propotion of success of population.

### Module IV : Testing of Hypothesis

Various definitions, Parametric tests: Tests concerning Means, Proportion and Variance and ANOVA. Non parametric tests:  $X^2$  tests - Sign test, Run test Mann-Whitney U test, Kruskal Wallis Test.

### References

1. Ackroyd, Stephen and John Hughes, 1992, Data Collection in context, New York, Longman.
2. Babbie, Earl, 1989, The Practice of Social Research, Belmont, California, Wadsworth Publishing Company.

3. Bailey Kenneth D, 1978, Methods of social Research, New York, The Free Press.
4. Black, James A and Dean J Champion, 1976, Methods and Issues in Social Research, New York, John Wiley and Sons.
5. Kothari C R, Research Methodology Methods and Techniques, Wiley Eastern Ltd.
6. Likert R, A Technique for the Measurement of Attitudes.
7. Robert K Yin 2010, Qualitative Research from start to finish, Guilford pub.
8. Siegel, Sidney, 1956, Non Parametric Statistics for the Behavioral Sciences, Sydney McGraw Hill Book Company.
9. Yates, Frank, sampling Methods of censuses and surveys, New York Hafner.
10. Cochran and William G, Sampling Techniques, New York, John Wiley and Sons.
11. SP Gupta, Statistical Methods S. Chand & Co., New Delhi.
12. Deepak Chawla and Neena Soadhi, 'Research Methodology: Concepts and Case' Vikas Publishing House, New Delhi (2011).
13. MLA Handbook for writers of Research Papers. 7<sup>th</sup> Edition, East west Press, New Delhi (2009).
14. Ranjit Kumar (2011) "Research Methodology: A step by step guide for beginner (Pearson 2<sup>nd</sup> Edition)
15. R A Cooper and A.J. Weekes: Data, Models and Statistical Analysis, Heritage Publisher, New Delhi.

**MODEL QUESTION PAPER**  
**Ph.D Pre Qualifying Examination (ECONOMICS)**  
**PAPER I : RESEARCH METHODOLOGY**  
**(From 2017 Examination onwards)**

**Time : 3 Hrs.**

**Max**

**Marks: 70**

**PART A**

**Very Short Answer Questions**

(Answer **all** Questions. Each Question carries **2** marks.)

1. What is falsification?
2. Write a note on 'plagiarism'?
3. Distinguish between Time series and Cross section data.
4. Define Mathematical Expectation
5. Define a random sample.
6. Define sampling distribution and Standard Error.
7. What do you mean by degrees of freedom?
8. Distinguish between p-value and level of significance.
9. What do you mean by partial correlation
10. What is correlation matrix?

**(10 x 2 = 20)**

**PART B**

**Short Essay Questions**

(Answer any **4** questions. Each Question carries **5** marks.)

11. Enumerate the different types of research
12. Describe the different scales of measurement with examples.
13. Explain the different methods of random sampling.
14. What are the properties of Normal Distribution?
15. Define the terms (1) Null Hypothesis  
(2) Alternative Hypothesis  
(3) Critical Region

16. A company's trainees are randomly assigned to groups which are taught a certain industrial inspection procedure by three different methods. At the end of the instructing period they are tested for inspection performance quality. The following are their scores:

Method A: 80 83 79 85 90 68 61

Method B: 82 84 60 72 86 67 91 62

Method C: 93 65 77 78 88 48

Use Kruskal-Wallis Test to determine at the 0.05 level of significance whether the three methods are equally effective.

**( 4 x 5 = 20)**

### **PART C**

#### **Long Essay Questions**

Answer any **2** Questions. Each Questions carries **15** marks.

17. Explain the different stages of Research Methodology

18. Fit a BD to the following data and test the goodness of fit.

x	:	0	1	2	3	4
f	:	8	22	40	20	10

19. How will you test the equality of means of two normal populations, explaining the different cases?

20. What is ANOVA Technique? What is the use of it? Explain. What are its assumptions?

**(2 x 15 = 30)**