Pre Ph.D. Course work for Mathematics

Paper – II: RESEARCH METHODOLOGY

Max Marks; 100 (Written 70. and Sessional 30)

Unit – I: Basic Concept

Meaning, Objective,. Motivation, Types of research, Research approaches, Significance of Research, Research process, Criteria for good research, Outcomes of research.

Research problem: Definition, Selection of problems Necessity of defining the problems, Techniques involved in defining a Research problems.

Unit – II: Research Design

Meaning and need of research design, Development of Research plan and Research Methodology, Hypothesis and its authentication.
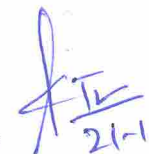
Unit – III: Review of Literature

Literature search methods. Preparation of reports, Research proposals and review articles, writing of references/bibliography and effective presentation.

Unit – IV: Area of Research

Fundamental Concept of various research fields of Mathematics: **Finsler geometry / Structures on Manifolds / Fluid Mechanics / Mathematical Modeling / Operations Research / Theory of Elasticity.** Review of literature in the relevant field.

References:

1. Kothari, C.R. (1985): Research Methodology, Methods and Techniques, New Delhi, Wiley Eastern Limited.
2. Dawson, Catherine (2002): Practical Research Methods, New Delhi, UBS Publishers.
3. Kumar, Rajit (2005): Research Methodology A Step-by step guide for Beginners (2nd) Singapore, Pearson Education.
4. H. Rund (1959): The Differential geometry of Finsler Spaces, Springer-Verlag.
5. K. Yano and M. Kon (1984): Structures of Manifolds, world scientific Publishing Co.Pvt. Ltd.
6. R.S. Mishra (1984): Structures on a Differential Manifolds and their Applications, Chandrama Prakashan Allahabad.
7. F. Chorlton (1985): Text Book on Fluid Dynamics, CBS Publication Delhi.
8. J. N. Kapur : Mathematical Modelling
9. H.A. Taha: Operations Research- An Introduction Macmillan Publishing Co., Inc., Newyork.

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(Dr. S. K. Tiwari)
Mathematics