



TR

MGM INSTITUTE OF HEALTH SCIENCES

(Deemed University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

PhD CET Syllabus

Paper I - Research Aptitude Test

a) Research Methodology - 30 Marks

- 1) Foundation of Research: Meaning, Objectives, Motivation, Utility, Characteristics and Types. Characteristics of scientific methods - understanding the language of research - Concept, Construct, definition, Variable. Scientific Research Process. Steps of research, methods of research, research ethics.
- 2) Problem Identification & Formulation: definition and formulating the research problem, Necessity of defining the problem, Importance of literature review in defining a problem. Literature survey: primary and secondary; web sources; critical literature review. Research Question - Investigation Question - Hypothesis testing - Qualities of a good hypothesis - Null hypothesis & Alternative Hypothesis
- 3) Research Design: Concept and Importance in Research - Features of a good research design - Exploratory Research Design - Concept, Types and uses, Descriptive Research Design - concept, types and uses. Experimental Design - Concept of Independent & Dependent variables. Biased and unbiased research design
- 4) Qualitative and Quantitative Research: Qualitative - Quantitative Research - Concept of measurement, causality, generalization, replication. Merging the two approaches. Biological data: Types of data - Qualitative data, Quantitative data
- 5) Data Collection and analysis: Execution of the research - Observation and Collection of data - Methods of data collection, hypothesis-testing - Generalization and Interpretation. Use of tools / techniques for Research: methods to search required information effectively.
- 6) Measurement: Concept of measurement - what is measured? Problem in measurement in research - Validity and Reliability. Levels of measurement - Nominal, Ordinal, Interval, Ratio.
- 7) Sampling, data collection and analysis: Concept of Statistical population, Sample, Sampling Frame, Sampling Error, Sample size, Non Response. Characteristics of a good sample, sample distribution, Probability and Probability distributions. Determining size of the sample - Practical considerations in sampling and sample size. Data analysis - Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis - Cross tabulations and Chi-square test including testing hypothesis of association including Chi test, correlation and regression analysis.

8) Interpretation of Data and Paper Writing: Graphical interpretation of data, Layout of a Research Paper, Journals, Ethical issues related to publishing, Plagiarism and SelfPlagiarism.

9) Use of tools / techniques for referencing and writing: methods to search required information effectively, PubMed, effective literature search using Entrez, Google Scholar. Software for paper formatting like MSOffice, software for detection of Plagiarism. Basics of internet and e-mailing. Reporting and Thesis writing - Structure and components of scientific reports - Types of report - Technical reports and thesis - Significance - Different steps in the preparation - Layout, Structure and Language of typical reports - Illustrations and tables - Bibliography, referencing and footnotes - Reproduction of published material - citation and acknowledgement - Oral presentation - Planning - Preparation - Practice - Making presentation - Use of visual aids - Importance of effective communication.

10) Application of results and ethics: Environmental impacts - Ethical issues - ethical committees - Commercialization - Copy right - royalty - Intellectual property rights and patent law - Falsification and verification.

11) Reasoning and Mental ability: Analogy, Logical reasoning and aptitude, Classification, Series, Coding-Decoding, Direction Sense, Representation Through Venn Diagrams, Mathematical Operations, Arithmetical Reasoning, Inserting the Missing Character, Number, Ranking and Time Sequence Test, Eligibility Test, Representation through Venndiagrams, Number & symbols ordering, Comprehension questions, Statement & assumptions, Statement & conclusions, Statement & actions.

Reference Books:

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. An introduction to Research Methodology, RBSA Publishers.
2. Kothari, C.R., 1990. Research Methodology: Methods and Techniques. New Age International. 418p.
3. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, EssEss Publications. 2 volumes. 4.
4. Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.
5. Wadehra, B.L. 2000. Law relating to patents, trade marks, copyright designs and geographical indications. Universal Law Publishing.
6. Leedy, P.D. and Ormrod, J.E., 2004 Practical Research: Planning and Design, Prentice Hall.