

UNIVERSITY OF CALICUT

Ph.D PQE Examination

AQUACULTURE AND FISHERY MICROBIOLOGY

RESEARCH METHODOLOGY

Unit I

Definition, need, process. Research objectives, Research approaches and Research process. Types of Research: Pure, Applied and Action Research. Kinds of Research: Diagnostic, Descriptive, Exploratory, Explanatory. Research Ethics – Animal ethics; Human ethics. Biosafety in research Scientific Misconduct- Falsification, Fabrication & Plagiarism, Intellectual Property Right

Unit II

Types of Literature search – use of library, books & journals – Medlines, internet. Review of Literature. Formulation of Hypothesis. Hypothesis Testing and estimation. Identification and selection of research problems, preparation of research proposal and submission of research project proposals to funding agencies. Steps in drafting reports. Layout of the Research project.

Unit III

Need for research design. Important concepts relating to design. Features of good design. Research designs. Basic principles of experimental design. Pre-experimental, CRD and Quasi-Experimental designs. Types of research design: Historical design, Descriptive design, case control, cohort, cross sectional, longitudinal

Unit IV

Data for Research. Collection of Data: Primary Data, Secondary data, Data Collection methods, Sampling Technique Data Analysis, , tabulations, classifications, Interpretations .Common soft wares for data analysis. Research Data analysis using R. Statistics in Research: Specific applications of measures of Central tendency and Dispersion, Measures of Relationship. Measurement in Research

Unit V

Scientific documents: Research Journal: online journals, Impact factor. Research paper, reviews, synopsis, thesis, conference papers and project reports. Publication – role of author, guide, co-authors. Components of a research articles. Citation styles, Bibliography Management, Footnotes, abbreviations, Referencing. Structure of Thesis and Content. Preparing Abstracts. Publishing: submission of manuscript, Evaluation of research articles, reprints. Report writing. Types of reports and Oral presentation.

Recommended Books:

1. RA. Day & Barbara Gastel How to Write and Publish a Scientific Paper.
2. C.R. Kothari, Research Methodology Methods and Techniques

3. Santosh Gupta, Research Methodology Methods and Statistical Techniques
4. Ranjith Kumar, Research Methodology: A Step-by-Step Guide for Beginners
5. N. Gurumani, Research Methodology for Biological science
6. Ranjit Singh, Research Methodology - For Ph.D. Course Work

Name.....

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UNIVERSITY OF CALICUT
Ph.D. PRELIMINARY QUALIFYING EXAMINATION (Course Work)
Aquaculture and fishery microbiology
Paper 1: PhD AQ C01: Research Methodology

Time: Three Hours
marks

Maximum: 70

Answer ANY FIVE of the following :-(5x6=30 marks)

1. What are the characteristics of a good sampling procedure?
2. Write short notes on methods of data collection
3. Define survey
4. Briefly explain research and scientific method
5. Briefly explain statistical process and their application in research.
6. What is ANOVA
7. Explain GLP

Answer ANY TWO of the following:(2x10=20 marks)

8. Write notes on plagiarism in research work.
9. Describe softwares for ecological research
10. Explain the concepts of bibliography and references.
11. Explain different types of research reports

Answer ANY ONE of the following :-(1x20=20 marks)

12. Explain about research ethics
13. Explain various steps involved in a research process.