

Ph. D Course Work

PAPER I: Research Methodology

End Term Exam : Marks: 75 Time: 3 hrs.

\*Assignment : Marks: 25

Total Marks : 100

Pass Marks : 50 %

- ① **Basics of Research:** Meaning, Aim and nature of scientific research, Approaches to research, Significance of research and Review of Zoological Research.
- ② **Development of Research Plan:** Defining the research question, Formulating hypothesis, Developing Methodology to answer the problem, Examining technical feasibility, Study of Relevant literature, and web-based learning
- ③ **Research Types and Data collection:** Basic Research and Applied Research, Data collection: Qualitative and Quantitative, Sampling - theory, types, Steps in sampling, Sample size, Advantages and limitations. Collection of Relevant methods and Standardization of methods.
- ④ **Statistical Concept:** Central tendency, Dispersion, Frequency Distribution, Probability and Significance, Testing hypothesis- t test, Chi Square test, Analysis of variance, ANOVA, DMRT, ANCOVA, Correlation & regression.
- ⑤ **Data Processing and Computer Application:** Summarization of Data, Software application- Word, Excel, Power Point, SPSS and any other available package for the scientific study and data analysis
- ⑥ **Scientific writing:** Thesis writing, Writing of paper, Mono graph, Popular article and research review; Conference/ Seminar presentation (Oral and Poster). Preparation of short communication and Review Article.

\*Assignment: Review of Published work/As decided by the department

HMS

~~PK~~  
PK

JC +  
HG

MKB  
DND  
DM

Computer  
Relevant

AT

Sharma

Sharma

Dwivedi

Sharma

Sharma

Dispersion, ANOVA, Correlation, regression → DND

Ph. D Course Work

PAPER II: Instrumentation and Biological Techniques

End Term Exam : Marks: 75 Time: 3 hrs.  
Assignment : Marks: 25  
Total Marks : 100  
Pass marks : 50 %

- ① Ecological Methods: Water quality analysis - Physical, Chemical - BOD, COD, Alkalinity/and Hazards; Biological - Plankton & Bacteria (AT) (DND)
  - ② Taxonomic tools and Morpho-taxonomical Method for species recognition. — (H.C.) (ATE DND)
  - ③ Cytogenetic and Microbiological Technique: Animal cell culture, Karyotyping and Idiogram, Isolation and culture of bacteria, Gram staining and fermentation methods. MLB 1 MLB
  - ④ Molecular Techniques - PCR techniques and application in quantitative and qualitative gene expression, Hybridization technique, DNA finger printing, Biomarker-Immunodiffusion technique. | ~~MLB~~  
HWS.
  - ⑤ Cellular Identification: Histological and Histochemical methods, Specimen preparation for Electron microscopy. (PK) HWS
  - ⑥ Separation and Analytical Techniques - Column Chromatography, GLC, HPLC, Gel Electrophoresis and Ultra Centrifuge | DM
  - ⑦ Principles and Application: UV spectrophotometer, Atomic Absorption Spectrophotometer | De.
- Assignment: Based on Experimental work /as decided by the department

*Jhalanagly*      *Soni*      *Lisingh*      *Sharma*      *Reddy*