Syllabus of Pre-PhD (Course Work)
M.D. UNIVERSITY ROHTAK
DEPARTMENT OF ZOOLOGY

Scheme & Syllabus of Pre-PhD (Course Work) Examination

Scheme of Examination of Pre-PhD (Course Work) Examination

Paper no	Nomenclature	Max Marks	Internal assessment	Theory	Time
Zoo-CW-I	Research methodology	100	20*	80	3Hrs
Zoo-CW-II	Biostatistics & Computers	100	20*	80	3Hrs
Zoo-CW-III	Applications of Techniques in Animal Sciences	100	20*	80	3Hrs

*Following will be criteria for the award of internal assessment:-

a) Attendance : 5 Marks
Less than 65% : 0 Marks

65 to 70% : 2 Marks. As per ordinance of PG classes

71 to 75% : 3 Marks

76 to 80% : 4 Marks

Above 80% : 5 Marks

b) Assignment/presentation : 5 Marks
c) Written Test : 10 Marks

HOD, Deptt. of Zoology

ZOO-CW-I: RESEARCH METHODOLOGY

Max Marks: 80+20 (Internal assessment) **Time allotted: 3 Hours**

Instructions for paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and shall contain eight to ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining eight questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will attempt five questions in all.

UNIT I

Meaning of Research in Biological Sciences, Methods of testing Hypotheses , Research plan and its components , Methods of Research (Survey, Observation, case study, experimental, historical and comparative methods) - Difficulties in Biological research.

UNIT II

Identification and formation of research problem (Hypothesis). Elements in research methodology: Research design (CRD, RBD, LSD). Scientific database: Science Direct and Pubmed.

UNIT III

Ethical, legal, social and scientific issues in Biological Research. A brief idea about the funding agencies such as DST, DBT, ICMR, CSIR and UGC. Role of IPR in Research and Development.

UNIT IV

Writing of Research Proposal, Report and Research Paper: Meaning and types - Stages in preparation - Characteristics - Structure - Documentation: Footnotes and Bibliography - Editing the final draft-Evaluating the final draft- Checklist for the of a good proposal/report/research paper.

Basic knowledge of organizing conferences, symposia, workshop, exhibition etc

Books Recommended:

- Research Methodology- G.R. Basotia and K.K. Sharma.
- Research Methodology- C.H. Chaudhary, RBSA Publication

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ZOO-CW-II: BIOSTATISTICS & COMPUTERS

Max Marks: 80+20 (Internal assessment) **Time allotted: 3 Hours**

Instructions for paper setter

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UNIT I

Variables in Biology, Collection, classification and tabulation of data. Frequency distribution, Diagrammatic and Graphical presentation of statistical data, Sampling techniques.

UNIT II

Measures of Relationship: Correlation – Simple, Partial and multiple- Regression- Simple and multiple-Association of Attributes – applications in research.

UNIT III

Hypothesis Testing and estimation: Fundamentals of hypothesis testing-Standard error point and interval estimates-Important non-parametric tests, Definitions and applications of Chi-square test,'t' and 'f' test.

UNIT IV

Meaning of analysis of variance with linear models. Analysis of variance for one-way classified data, analysis of variance for two-way classified data.

Computer Basics: Course introduction, Office Applications: MS Office 2000/XP including MS Word, MS Excel, MS PowerPoint and internet.

Books Recommended:

- Elements of Biostatistics in Health Science- W. Daniell.
- Statistical Methods for Research: S. Singh et al (1988) Central Publishing Ludhiana.
- Fundamental of Statistics – D. N. Enhance.
- Statistical Methods: S.P. Gupta. S. Chand Publication
- Fundamentals of Biostatistics- Khan and Khanna, Ukaz Publication
- Biostatistical analysis- Zerold and Jar.

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ZOO-CW-III: APPLICATIONS OF TECHNIQUES IN ANIMAL SCIENCES

Max Marks: 80+20 (Internal assessment) **Time allotted: 3 Hours**

Instructions for paper setter

There will be a total of nine questions. Question No. 1 will be compulsory and shall contain eight to ten short answer type questions without any internal choice and it shall cover the entire syllabus. The remaining eight questions will include two questions from each unit. Candidates will be required to attempt one question from each of the four units. They will attempt five questions in all.

UNIT-I

Biophysical methods**:** Analysis of biomolecules using UV/visible spectroscopy, fluorescence spectroscopy, structure determination using X-ray diffraction and NMR, analysis using different types of mass spectrometry, surface plasma resonance, radiolabing and immunoassay techniques.

UNIT - II

Gel filteration, ion exchange & affinity chromatography; gas chromatography; High pressure liquid chromatography (HPLC), Electrophoresis (starch, agarose, PAGE), Electrofocussing. Enzyme and biosensor technology.

UNIT – III

Southern, Northern and Western blotting techniques, Polymerase Chain reaction, sequencing of nucleic acids, measuring nucleic acid and protein interaction. Flow cytometry, FISH & GISH, animal tissue culture.

UNIT – IV

Computational methods: Nucleic acid and protein sequence databases; data mining methods for sequence analysis, web-based tools for sequence searches, motif analysis and presentation. Phylogenetic implications of computational data

Suggested Books:

Molecular cloning A Laboratory Manual 3rd edition Vol. 1,2, 3- Sambrook and Russell, Churchill press, 2007