

Syllabus of Pre-PhD (Course Work)

APPLICATIONS OF TECHNIQUES IN ANIMAL SCIENCES -2014-15

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

Analysing the application of techniques in animal sciences research: types of microscopy; microtomy. Biophysical methods: Analysis of biomolecules using UV/visible, fluorescence, circular dichroism, NMR and ESR spectroscopy, structure determination using X-ray diffraction and NMR; analysis using light scattering, different types of mass spectrometry and surface plasma resonance methods.

UNIT - II

Ultracentrifugation (Velocity and buoyant density); Gel filtration, ion exchange & affinity chromatography; thin layer chromatography; gas chromatography; High pressure liquid chromatography (HPLC), Electrophoresis (starch, agarose, PAGE); Electrofocussing. Enzyme technology: Animal protein/enzyme purification; application of biosensor development in different systems

UNIT – III

Determination of toxicity: Acute, Chronic; Nucleic acid hybridization and cot curves; sequencing of nucleic acids; Southern, Northern and South -Western blotting techniques; Polymerase Chain reaction; measuring nucleic acid and protein interaction. Flow cytometry, Karoyotyping; FISH & GISH; Spirometry; 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

Radio labeling techniques: detection and measurement; incorporation of radioisotopes in biological tissues and cells, molecular imaging of radioactive material, safety guidelines; Immunoassays & diagnostic applications

Suggested Books:

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