

2. R.A. Goedsby, T.J. Kindt Kuby Immunology. 4th Edition W.H. Freeman and Company New York.
3. G.M. Cooper : The Cell : A Molecular Approach ASM Press, Washington.
4. Bruce Alberts, D. Bray, J. Lewis, M. Raff. Keith Roberts J.D. Watson: Molecular Biology of the Cell. Garland Publishing Inc. New York & London.
5. Lodish, H., Berk, A., Zipursky, S.L., Matsudaira. P., Baltimore, D. Darnell, J.: Molecular Cell Biology 4th Edition W.H. Freeman and Company New York.
6. William E. Paul Eds Fundamentals of Immunology, 4th Edition. Lippincott. Raven Publishers, Philadelphia.
7. Evaluation of the carcinogenic risk of chemicals to humans, IARC Monograph, Lyon, France.

M.SC. (FINAL) ZOOLOGY - 2006-07

PAPER-IV

ELECTIVE PAPER GROUP-I (Molecular Cell Biology stream)

NEUROBIOLOGY, GENOME AND GENOMICS

Duration: 3 hours

M.M. 100

UNIT - I

- 1 General organization of nervous system, anatomy and histology of various regions of brain.
- 2 Electrical properties of neurons, conduction of nerve impulse, action potentialion channels, synaptic transmission.
- 3 Neurotransmitters - types, their synthesis, storage and release
- 4 Receptor interactions and signal transduction in a nerve cell
- 5 Aspects related to transport of nutrients-Blood brain barrier, axoplasmic transport
- 6 Hypothalamo- hypophysial system- structure, hypothalamic release and release inhibiting hormones.

UNIT-II

- 7 Neuropeptide hormones-general idea, distribution, evolution, synthesis and processing.

- 8 Production of poly and monoclonal antibody against neuropeptides, various methods of localization - Histological, immunocytochemical techniques (LM and EM)
- 9 Quantitative measurements, stress and its relationship with nervous system.
- 10 Neurotoxic substances and their effects on nervous system. General idea of drugs acting on central nervous system, and peripheral nervous system (in brief). General idea of drugs of herbal origin and their relationship with CNS functions and diseases (in brief).

UNIT-III

- 11 Development of brain, regeneration and degeneration, their mechanisms
- 12 Plasticity of nervous system, aging.
- 13 Factors affecting development of nervous system.
- 14 Techniques of studying nervous system, tracing techniques quantitative techniques-cytometry, stereology, image analysis.
- 15 Stereotaxic studies, MRI, CAT, EEG (Brief idea).

UNIT-IV

- 16 Concept of gene isolation, sequencing (Sanger's method), synthesis of gene, gene amplification

- 17 Gene cloning- cloning vectors, restriction enzymes in cloning.
- 18 Cloning in bacteria and eukaryotes, molecular probes, C-DNA and genomic library, gene transfer techniques. Transgenic animals (Brief idea).
- 19 Chromosome walking, RFLP, RAPD, DNA finger printing and blotting techniques.

UNIT-V

- 20 Studying a transcript of cloned gene, post-translational processing, protein targeting, studying the regulation of gene expression in eukaryotes (general idea).
- 21 Gene and genome- Bioinformatics (Brief idea).
- 22 Gene technology and its applications.
- 23 Ethical and social implications of gene technology, in developing countries. Patenting laws, biosafety regulations and intellectual property rights.
- 24 Research methodology in neurobiology and biotechnology.

REFERENCE BOOKS (LATEST EDITIONS) :

1. Gerald Karp : Cell and Molec. Biol. II ed., John Willey.
2. David Freifelder :Molecular Biology, II ed., Narosa Publ.