

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Biomedical Science)
Semester: III
Syllabus with Effect from: June - 2014

Paper Code: PT03CBMC01	Total Credit: 4
Title of Paper: Molecular Biology and Clinical Genetics	

Unit	Description in Detail	Weightage (%)
I	DNA replication, repair and recombination: unit of replication, enzymes involved, replication origin and replication fork, fidelity of replication, extrachromosomal replicons, DNA damage and repair mechanisms	25%
II	RNA synthesis and processing: Transcription factors and machinery, formation of initiation complex, transcription activators and repressors, RNA polymerases, capping, elongation and termination, RNA processing, RNA editing, splicing, polyadenylation, structure and function of different types of RNA, RNA transport	25%
III	Fundamentals of Chromosomes: Fundamentals of chromosomes, structure and inheritance Chromosome organization, Chromosomal abnormalities; Pedigree analysis; Mendelian and non-Mendelian pedigrees; Mosaicism, Chimerism, Polygenic and Multifactorial inheritance; Recombinant DNA technology: Introduction, principles, methods and applications. Possible biological hazards of recombinant DNA technology	25%
IV	Mitochondrial genetics: Structure and molecular genetics of Mitochondria; mitochondrial, muscle and neurological disorders, Cancer- Diagnosis, Testing. Features of human genome: Mapping of human genome. Human genome project. Manipulation of human genes. Creating animal models of diseases. Gene therapy and other molecular genetics based therapeutic approaches	25%

Basic Text & Reference Books:-

- Brown, T.A., Genomes 3, Garland Science; 3 edition
- Cooper, G. M., Hausman R. E., The Cell: A molecular approach, Sinauer Associates Inc., U.S., 3rd Revised edition
- Lodish, H., Berk, A., Kaiser, C. A., Kreiger, M., Bretscher, A., Ploegh, H., Matsudaira P., Molecular Cell Biology, W. H. Freeman; 6th edition
- Nelson D. L., Cox M. M., Lehninger Principles of Biochemistry, W. H. Freeman; 5th edition
- Berg, J. M., Tymoczko, J. L., Stryer, L., Biochemistry: International edition, W. H. Freeman; 7th edition
- Watson, J.D., Meyers, R. M., Caudy, A. A., Recombinant DNA: Genes and Genomes- A short course, Id Spring Harbor Laboratory Press; 3rd edition
- Emery, A.E.H., Mueller, R. F., Elements of Medical Genetics. Churchill Livingstone, Edinburgh.
- Weatherall, D. J., The New Genetics and Clinical Practice. Oxford University, UK

