

B. Sc. Bioscience

Scheme of Examination

B.Sc. I Year

Paper	Name of Paper	Max Marks	Total Marks	Min Marks
Paper - I	Cell Biology and Genetics	50	100	33
Paper - II	Biodiversity and Systematics of Plants and Microbes	50		
Practical	Based on Paper - I & - II		50	17

Syllabus

B.Sc. I Year

Paper – I	
Cell Biology and Genetics	
Unit – I	Cell wall and Cell membrane; Structural components, organization and function. Cytoskeletons. Structure and function of Nucleus, nuclear pore complex, Nucleolus and other subnuclear organelles.
Unit – II	Structure and function of Endoplasmic reticulum, Golgi bodies, Lysosomes, Peroxisomes, Ribosomes, Chloroplast and Mitochondria.
Unit – III	Structure and organization of chromosomes. Cell division in prokaryotes and eukaryotes. Structure, types and function of DNA and RNA. Genetic code. Programmed cell death and Apoptosis.
Unit – IV	Identification of the genetic material: Experiments of Griffith. Molecular mechanism of recombination: Homologous and site specific recombination. Recombination in bacteria: Conjugation, transformation, Transduction. Basic concept of genetics. Mendelian Genetics: Principle of segregation and independent assortment, monohybrid, dihybrid and trihybrid cross, epistasis.
Unit – V	Mutation: Point mutations, base substitutions, base addition and deletion, Mutant phenotypes and their detection, Spontaneous mutation, Induced mutations, molecular mechanisms of mutations. Concept of transgenic animals and plants.

Paper – II	
Biodiversity and Systematics of Microbes and Plants	
Unit – I	Bacteria: General characteristics, Structure, nutrition, reproduction. Classification of bacteria- outline of the prokaryotes as per Bergey's Manual 2001. Economic importance of bacteria Virus: General characteristics, structure and classification of viruses. Bacteriophage: λ phage, structure and life cycle. Plant virus: TMV structure and life cycle. Animal virus: HIV structure and life cycle.
Unit – II	Algae: General characters, classification and economic importance, important features and life history of Chlorophyceae; Volvox, Oedogonium. Xanthophyceae; Vaucheria. Pheophyceae; Sargassum. Rhodophyceae; Polysiphonia.
Unit – III	Fungi: General characters, classification and economic importance, important features and life history of Mastogomycotina; Pythium, Zygomycotina; Mucor. Ascomycotina; Peziza. Basidiomycotina; Agaricus. Deuteromycotina; Colletotrichum. General characters of Lichen.
Unit – IV	Bryophyta: Structure, reproduction and classification of Hepaticopsida- Marchantia; Anthocerotopsida- Anthoceros; Bryopsida- Funaria. Pteridophyta: Important characteristics of Psilopsida, Lycoposida, Sphenopsida, Pteropsida, Lycopodium, Selaginella, Pteris and Marsilea.
Unit – V	General feature of Gymnosperm and their classification: Evolution and diversity of gymnosperm. Geological time scale, fossilization and fossil Gymnosperm. Morphology of vegetative and reproductive parts; anatomy of

	<p>roots, stem and leaf, reproduction and life cycle of Pinus, Cycas and Ephedera. Classification of angiosperm: Salient features of the systems proposed by Bentham and Hooker, and Engler and Prantl. General account of the families: Brassicaceae, Malvaceae, Fabaceae, Apiaceae, Acanthaceae, Apocyanaceae, Solanaceae, Euphorbiaceae, Liliaceae, and Poaceae.</p>
<p>Practical</p>	<ol style="list-style-type: none"> 1. Preparation of temporary smear of salivary gland chromosome of <i>Drosophila</i>. 2. Identification of mutant phenotypes of <i>Drosophila</i> / <i>Arabidopsis</i> stock maintained in the department. 3. Bacterial culture liquid and plate for mutation studies. 4. Study of cell structure and measurement from onion leaf peels: demonstration of staining and mounting methods. 5. Study of plastids to examine pigment distribution in plants (<i>Cassia</i> / <i>Lycopersicon capsicum</i>). 6. Determination of hill activity in chloroplast of spinach. 7. Isolation and staining of mitochondria using Janus green. 8. Isolation of microorganisms from soil, air and water 9. Microbial culture, staining and identification 10. Study of specimens of representative examples of different class. 11. Study of permanent slides of different material of representative examples as per theory syllabus. 12. Study of disease symptoms in plants. 13. Isolation of Bacteria from various sources and their identification. 14. Isolation of Fungi from various sources and their identification. 15. Examination of fungal flora of different local ponds 16. Morphology and anatomy of Marchantia and Anthoceros 17. Morphology and anatomy of Selaginella and Marsilea 18. Morphology and anatomy of Cycas, Pinus and Ephedra 19. Study of vegetative and reproductive parts of species belonging to families

Books Recommen- ded	
1.	Antherly, A.G., Gitton J.R. and Mc Donald, 1999. The Science of Genetics. Saunders College Publishing Co. Forth Worth, USA.
2.	Buchanan, B.B., Gruissem, W. and Jones, R.L. 2000. Biochemistry and Molecular Biology of Plants. American Society of Plant Physiologists, Maryland, USA.
3.	David E. Sadava. 1993, Cell Biology: Organelles Structure and Function. Jones and Bartlett Publishers
4.	Gardeners, J., Simmons, H.J. and Snustad, D.P. 1991. Principles of Genetics (8 th Ed.). John Wiley and Sons N.Y.
5.	Lowey 1991. Cell Structure and Function – Science
6.	Robertis D. – Cell Biology, Science Publication.
7.	Sharma, A.K. and Sharma, A. 1999. Plant Chromosome: Analysis, Manipulation and Engineering, Harwood Academic Publishers, Australia.
8.	Singh, B.P. – Fundamentals of Genetics.
9.	Snustad, D.P., and Simmons, M.J. 2000. Principles of Genetics (2 nd Ed). John Wiley and Sons. Inc., USA.
10.	Verma, P.C. And Agrawal, V.K. – Cell Biology, Genetics, Molecular Biology, Evolution & Ecology, S.Chand Publication.
11.	General microbiology By Pawar and Daginawala
12.	Microbiology by Pelczar and Reid
13.	Microbiology by PD Sharma
14.	Saxena and Sarbhai – A textbook of Botany (Angiosperms)
15.	Bendre and Kumar – Economic Botany
16.	Singh and Jain – Taxonomy of Angiosperms
17.	Pandey, B.P. – Textbook of Botany
18.	Vashishtha, B.R. – Bryophyta
19.	Vashishtha, P.C. – Pteridophyta
20.	Vashishtha, P.C. – Gymnosperms