14/5/12 Dr. Gaur

Devi Ahilya Vishwavidyalaya, Indore

Syllabus for B.Sc. Part-I, II and III (Optional subject- Life Science) 2011 Onwards

Semester	Course title	Distribution of marks			
		CCE	Semester Exam	Practical Exam	Total
Sem-I	Biochemistry and Cell biology	15	85	50	150
Sem-II	Environmental biology, Genetics and Evolution	15	85	50	150
Sem-III	Morphology, Developmental Biology and Physiology of Angiosperms	15	85	50	150
Sem-IV	Morphology, Developmental Biology and Physiology of Mammals	15	85	50	150
Sem-V	Microbiology, Immunology and Animal cell culture	15	85	50	150
Sem-VI	Molecular biology, Genetic engineering and Plant tissue culture	15	85	50	150

Scheme of practical examination in each semester

Total marks- 50 **Duration- 5 Hrs.**	1. Major exercise-1	12 Marks
	2. Major exercise -2	12 Marks
	3. Minor exercise	06 Marks
	4. Spotting	05 Marks
	5. Viva-voce	05 Marks
	6. Practical record	05 Marks
	7. Project	05 Marks

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B.Sc. Part- I (Life Science) Semester-I

Semester-I	Biochemistry and Cell Biology	CCE- 15 Marks End Exam. - 85 Marks
Unit-I	Carbohydrates: Classification, structure and function Lipids: Structure and function Vitamins: Structure and function.	
Unit-II	Proteins: Classification, structure and function Nucleic acids: Structure and function Enzymes: Types and Factors affecting enzyme activity.	
Unit-III	Structure of prokaryotic and eukaryotic cells. Structure and function of Plasma membrane, Endoplasmic reticulum, Golgi apparatus, Lysosomes, Ribosomes, Microtubule, Microfilaments and Intermediate filaments.	
Unit-IV	Structure and function of following organelles: Mitochondria, Chloroplast, Nucleus. Structure of Chromosomes, Polytene and Lampbrush Chromosome. Nucleolus and nucleolar organizing regions. Cell cycle and cell division (Mitosis and Meiosis).	
Unit-V	Elementary idea of techniques: Microscopy: Light (bright field, dark field), Phase contrast, Fluorescence, Electron (SEM and TEM) Chromatography: Paper, Thin layer, Ion exchange and Gel filtration Spectroscopy: Beer Lambert's Law, UV and Visible spectroscopy Electrophoresis: Agarose gel, SDS PAGE and Native PAGE.	
List of Practicals	1) Qualitative tests for carbohydrates, lipids and proteins. 2) Quantitative estimation of starch and protein. 3) Effect of temperature, pH and concentration on enzyme activity. 4) Chloroplast isolation from spinach leaves and demonstration of Hill's activity. 5) Study different stages of mitosis and meiosis. 6) Study of special types of chromosomes. 7) Paper chromatographic separation of amino acids. 8) Thin layer chromatographic separation of plant pigments. 9) Demonstration of Gel electrophoresis.	
Recommended Books	1. Principles of Biochemistry. Lehniger, 3rd edition by Nelson and Cox (Worth) 2000 2. Biochemistry Stryer 5th edition W.H. Freeman 2001. 3. Harper's Biochemistry, 1999 (McGraw-Hill). 4. Zubey GL. Parson WW and Vance DE (1994) Principles of Biochemistry – WM.C. Brown Publishers, Oxford, England. 5. Cell Biology, Powar C.B. Himalaya Publishers, Students Edition 6. Cell Biology, Rastogi, S.C. (Edn. 3) New Age International, 2007. 7. Essential Cell Biology (2nd Ed) by B. Alberts et al, Taylor & Francis Group; 2 edition. 8. Fundamentals of Biochemistry, Jain, J.L. 9. Cytology and Genetics, Sen, S., Kar, D.K., Johri, B.M. Narosa Publishing House. 10. Biochemical Methods of Analysis: *Theory and Applications*, Saroj Dua, S., Garg, N. Narosa Publishing House 11. Biochemistry, Sharma, D.K. Narosa Publishing House 12. Cell Biology for Biotechnologists.- Shaleesha A. Stanley, Narosa Publishing House	

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B.Sc. Part- I (Life Science) Semester-II

Semester-II	**Environmental Biology, Genetics and Evolution**	**CCE- 15 Marks** **End Exam. - 85 Marks**
Unit-I	Ecosystem concept- structure and function, ecological pyramids, energy flow in ecosystem. Food chain, food web and trophic levels. Ecological factors (Light, temperature, positive biotic interactions and negative biotic interactions) Ecological adaptation in plants and animals (aquatic and desert) Ecological succession: Hydrosere and Xerosere.	
Unit-II	Sources, nature and biological effects of air and water pollutants. Ozone layer depletion, acid rain and global warming (Green house effect). Biogeochemical cycles: Nitrogen, Carbon, Sulphur and Phosphorus cycles. Biofertilizers: *Rhizobium, Azotobacter, Azolla, Nostoc,* PSM and VAM Biopesticides: *Bacillus thuringiensis* , *Trichoderma* and their importance	
Unit-III	Mendelian Laws of inheritance, incomplete dominance, codominance, epistasis, Complementory ratio and supplementary ratio, Cytoplasmic inheritance; plastid and kappa particles. Linkage and crossing over (Coupling and repulsion hypothesis) Mechanism of crossing over and its significance. Mechanism of sex determination (Chromosomal theory), sex linked inheritance.	
Unit-IV	Structural and numerical chromosomal aberrations. Chromosome related disorders: Kleinfelter's syndrome, Turner's syndrome, Down's syndrome and Cri-du-chat syndrome Mutations- Spontaneous and induced, Chemical and physical mutagens Molecular basis of mutation.	
Unit-V	Theories of Organic evolution: Lamarckism and Neo Lamarckism, Darwinism and Neo Darwinism, Germplasm theory, Mutation theory. Gene pool, Random genetic drift, Hardy Weinberg law. Isolation and types of isolating mechanisms (Pre mating and post mating) Instantaneous and gradual speciation.	
List of Practicals	1) Determine frequency, density and abundance of vegetation by quadrate method. 2) Study of ecological adaptations in hydrophytes and xerophytes. 3) Soil analysis (pH, temperature, moisture content and inorganic radicals). 4) Water analysis (pH, Dissolved oxygen and Carbon dioxide). 5) Working out the laws of inheritance. 6) Study of chromosomal aberrations using charts. 7) Study of biogeochemical cycles using charts.	
Recommended Books	1. Cytogenetics,: Darbeshwar Roy, Narosa Publishing House 2. Environmental Science: *A New Approach* . Dahiya, P.and Ahlawat, M. Narosa Publishers 3. Ecology - Subrahmanyam, N.S and Sambamurty, A. V. S. S. Narosa Publishing House 4. Fundamentals of Genetics : Miglani, Gurbachan S. Narosa Publishing House 5. Genetics: Sambamurty, A. V. S. S. Narosa Publishing House 6. Molecular Biology of Cell: Alberts, B.D., Levis, J.R., Ruberts, M. & Watson, Garland Pub. Co. 7. The Science of Genetics: Atherly, A.G., Girton, J.R. & McDonald, J.F. Saunders College Pub. 8. Environmental Studies: Basak, Pearson Publishers. 9. Principles of Cell and Molecular Biology: Kleinsmith, L.J. and Kish, V.M. Harper Collins Pub. 10. Concepts of Genetics: Klug, Pearson Publishers 11. Concepts of Ecology: Kormondy, E.J. Prentice-Hall India 12. A Text Book of Cell and Molecular Biology: Gupta, P.K., Rastogi Publications, Meerut 13. Genetics : Gupta, P.K., Rastogi Publications, Meerut 14. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology: Verma, P.S. & Agrawal, V.K. – S. Chand Publications. 15. Environmental Science: Palanisamy, Pearson Publishers	

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