COMMECS COLLEGE

Subject: Botany (Biology) **Section: Pre-Medical** **Macro Plan (2024-2025)**

HOD: Sana Noman

Teacher/Prepared by: Yamna Rao & Ammar Zia **Class: XII**

Start Date	**End Date**	**Number Of Periods**	**Topic/Chapter**	**Contents**	**Objectives** By the end of the unit S.W.A.T.:
01 Aug 2024	6 Sep 2024	12	Chapter # 08 Chromosomes & DNA	1.Type of Chromosomes. 2.Chemical composition of chromosomes. 3.Ultra-structure of chromosome. 4.Chromosomes as carriers of genes. 5.Chromosomal theory of heredity. 6.DNA Evidence of DNA as hereditary material. 7.Brief reference to DNA structure. 8.Watson & crick model of DNA, Replication of DNA, Genes the units of hereditary information. 9.The one gene-one enzyme hypothesis, Cells use RNA to make protein, An overview of gene expression. 10.Transcription, Translation, the genetic code. 11.The genetic code uses three bases to specify each Amino acid. 12.Mutation, DNA damage, Sickle cell anaemia and Phenylketonuria. 13. Cell divisions. 14. Amitotic cell-division of prokaryotes. 15. Cell Death (Necrosis & Apoptosis). 16. Mitosis with Significance of mitosis. 17-Cancer because of uncontrolled cell-division. Why do cancer cells	Define the Chemical composition of chromosomes with Ultra structure of chromosome. 2-Comprehend DNA Evidence of DNA as hereditary material. 3-Make out the genetic code uses three bases to specify each Amino acid. 4-Distinguish b/w Transcription and Translation. 5-Differentiate b/w the genetic code uses three bases to specify each Amino acid. 6-Describe the process of Cell Divisions 7-Understand different function of Amitotic cell-division of prokaryotes 8-Make out Significance of mitosis. 9-Understand all function of Substages of interphase.

				kill? 18-Meiosis. 19-The events of meiosis & Significance. 20-Interphase & cell cycle, Substages of interphase, Down's syndrome (trisomy Human diseases or defects due to abnormal number of chromosomes. Klinefelter's syndrome (XXY), Turner's syndrome (XO)	
9 Sep 2024	11 Oct 2024	13	Chapter # 09 Inheritance	1-Genes & alleles. 2-Review of Mendel's laws of inheritance. 3-Law of segregation (Mendel's first law). 4-Incomplete dominance & codominance. 5-Multiple alleles. 6-Continuously varying trait (polygenic inheritance). 7-Pleiotropy (interrelated pathways in metabolism). 8-Linkage & crossing over. 9-Sex determination & sex linkage. 10-Colour-blindness, Haemophilia & Diabetes mellitus	1-Comprehend the Law of segregation (Mendel's first law). 2-Define Continuously varying trait (polygenic inheritance). 3-Understand both the processes Sex determination & sex linkage. 4-Comprehend the terms of Haemophilia & Diabetes mellitus.
14 Oct 2024	18 Oct 2024	**First Term Examination**			
21 Oct 2024	26 Oct 2024	02	Paper discussion & individual problem-solving.		
	Total	27	Classes conducted (27) (Bot) 39.70 % (Approx.)		

28 Oct 2024	22 Nov 2024	10	Chapter # 10 Evolution	1. The Evolution of the concepts of Evolution 2. Evidences of Evolution 3. Evolution of Eukaryotes from Prokaryotes 4. Lamarckism 5. Darwinism 6. Neo-Darwinism	• Describe creationism and the theory of evolution as two contradictory ideas. • Relate Quranic injunctions to the process of the evolution of man • Explain how biogeography provides an evidence for evolution. • Describe the evidences of evolution that come from paleontology, comparative anatomy and molecular biology. • Identify questions that arise from concepts of evolution and diversity (e.g., What factors have contributed to the dilemma that pharmaceutical companies face in trying to develop new antibiotics because so many micro-organisms are resistant to existing antibiotics?). • Describe the theories that have been put forwarded about the mechanism of evolution of eukaryotes from prokaryotes. Justify Lamarck as an early proponent of evolution. • Describe the theory of inheritance of acquired characters, as proposed by Lamarck. • Outline the steps of the evolution of the giraffe, as illustrated in

					Lamarckism. • State the drawbacks in Lamarckism. • Briefly describe the observations Darwin made during his voyage on HMSBeagle. • Explain the theory of natural selection as proposed by Darwin. • Describe the assumptions of the Hardy-Weinberg theorem and relate these to the factors that change the allelic frequencies of the population. • Explain the concept of genetic drift (neutral selection).
25 Nov 2024	20 Dec 2024	09	Chapter # 11 Man & His Environment	1- Biogeochemical Cycle 2- The Flow of Energy 3- Ecological Succession 4- Population Dynamics 5- Human Impacts on Environment 6- Environmental Resources and their Depletion	• Define biogeochemical cycles and locate the primary reservoirs of the chemicals in these cycles. • Describe productivity in terms of gross primary productivity and net primary productivity. • Define ecological succession as the process through which ecosystems change from simple to complex. • Describe primary and secondary succession. Differentiate between xerarch and hydrarch

					succession. • Describe characteristics of a population, such as growth, density, distribution, carrying capacity,minimum/viable size. • Explain, using demographic principles, problems related to the rapid growth of human populations and the effects of that growth on future generations (e.g., relate the carrying capacity of the Earth to the growth of populations and their consumption of resources). • Investigate the effects of human population growth on the environment and the quality of life. • Relate the need of the nuclear power to the scarcity of fossil fuels. • State the problems of using nuclear power (surety of safe operation and safe disposal of thewastes). • Describe the causes of the increasing concentration of carbon dioxide in the world's atmosphere. • Distinguish between

					renewable and non-renewable environmental resources. • Describe how man is responsible for the depletion of environmental resources. • Describe the conventional and non-conventional energy resources.
06 Jan 2025	11 Jan 2025		**Second Term Examination**		
	Total	19	Classes conducted (Bot) (19) Term: 27.94% , Total-69.11%		
20 Jan 2025	21 Feb 2025	10	Chapter #12 Biotechnology	1. Cloning of Genes 2. DNA Sequencing 3. DNA Analysis 4. Genomic Maps 5. Tissue Culture 6. Transgenic Bacteria, Plants and Animals 7. Biotechnology and Healthcare 8. Scope and Importance of Biotechnology	• Define gene cloning and state the steps in gene cloning. • Describe the techniques of gene cloning through recombinant DNA technology. • Brief introduction of the Maxam I Gilbert procedure and the Sanger-Coulson method of DNA sequencing. • Describe the principles of Gel Electrophoresis as being used in gene sequencing. Introduce the automated DNA sequencing as based on the Sanger-Coulson method. • Describe the purposes and mechanism of DNA

					analysis. • Define the terms genome analysis, genome map and genetic markers. • State the history of the human genome project admiring James Watson as its first director. • Define following terms related to plant tissue culture; explants, callus, micro-propagation, plantlets, somatic embryogenesis, somaclonal variation. • Explain tissue culture and differentiate between the organ culture and cell culture. • State the objectives of the production of transgenic bacteria, transgenic plants and transgenic animals. • Describe different methods applied for the introduction of DNA into plant and animals cells/ embryos. • Describe the role of biotechnology in the production of insect, virus and herbicide resistant plants. • Describe how biotechnologists are able to combat health problems by producing vaccines. • List the hazards and

					social/ ethical implications of using gene technology in human.
22 Feb 2025	20 Mar 2025	11	Chapter # 13 Biology & Human Welfare	1. Vaccination and Integrated Disease Management 2. Animal Husbandry 3. Latest Techniques applied to enhance Crop and Fruit yield 4. Home Gardening 5. Role of Microbes in Human Welfare	• Explain what is meant by integrated disease management • Describe vaccination and its importance. • Describe animal husbandry and the role of life stock in national economy (milk, meat, eggs, wool and other miscellaneous products). • Describe different methods adopted for plant improvements (acclimatization, selection, hybridization and back crosses etc). • Explain home gardening and its importance. • Explain the role of microbes in household food processing, industrial production, sewage treatment and energy generation.
07 April 2025	18 April 2025		**Preliminary Examination**		
	Total	21	Classes conducted (Bot) (21) Term: 30.88% , Total 100%		