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Posted in Maharashtra State Board Notes Class 12 Biology Short Notes PDF Download: Biology is the study of life, from tiny microorganisms to complex ecosystems. It helps us understand how living organisms function, evolve, and interact with the world. For Class 12 students, Biology is a crucial subject, forming the foundation for careers in medicine, biotechnology, and research. Join Telegram Join WhatsApp If you're preparing for your board exams, competitive tests like NEET, or just want a deeper understanding of the subject, handwritten notes can be a game-changer. In this article, we bring you Class 12 Biology Handwritten Notes PDFs chapter-wise, making learning simpler, structured, and engaging. Below is the complete list of chapters along with their download links for your convenience. Name of the Notes / BookLinkComplete Biology study notes for NEET,CBSE Class XI and Class XIIView on AmazonCBSE Chapterwise Instant Notes Class 12 BiologyView on Amazon12 Years CBSE Class 12 Biology Previous Year-wise Solved Papers View on Amazon Handwritten notes are known for their clarity, conciseness, and effectiveness in learning. Here's why they are helpful: Easy to Understand: Simplified explanations and diagrams for better retention. Exam-Oriented: Covers all NCERT topics concisely. Saves Time: Helps in quick revision before exams. Memory Boosting: Writing and reading handwritten notes reinforce learning better than printed texts. Now, let's dive into the key concepts of Biology covered in Class 12. Class 12 Biology is divided into two broad parts: Reproduction, Genetics & Evolution Biotechnology, Human Welfare & Ecology Let's explore these topics with real-life examples! Reproduction is the process by which living organisms give rise to offspring. Example: Flowers producing seeds (sexual reproduction) vs. bacteria multiplying through binary fission (asexual reproduction). Interesting Fact: Did you know that bananas are seedless because they are grown through vegetative propagation? Genetics deals with the transmission of traits from parents to offspring. Example: Your eye color is determined by genes inherited from your parents. Comparison: Think of DNA as a book where genes are the words that define how an organism looks and functions. 3. Evolution – The Story of Change Evolution explains how life has changed over millions of years. Example: Birds evolved from dinosaurs! Real-Life Connection: Antibiotic resistance in bacteria is a modern-day example of evolution in action. Biotechnology uses biological systems to develop useful products. Example: Insulin production using genetically modified bacteria helps diabetic patients. Comparison: Just like mobile apps improve our daily lives, biotechnology enhances medicine and agriculture. Ecology is the study of interactions between living organisms and their environment. Example: Cutting down forests affects rainfall and climate. Did You Know? The Amazon rainforest is called the 'lungs of the Earth' because it produces 20% of the world's oxygen! Q1: Are these notes based on NCERT syllabus? Yes, these notes strictly follow the NCERT Class 12 Biology syllabus and are useful for board exams as well as NEET preparation. Q2: How can I effectively use these notes? Use them for daily study, make flashcards for important terms, and revise them before exams. Q3: Do these notes include diagrams? Yes! The notes contain well-labeled diagrams that make understanding concepts easier. Q4: Are these handwritten notes better than textbooks? Textbooks provide detailed explanations, but handwritten notes help in quick revision and retention of key points. Q5: Can I download all notes at once? For now, the notes are provided chapter-wise, but we will soon provide a single download link for the complete syllabus. Class 12 Biology is an exciting subject that explains the mysteries of life. With these handwritten notes, you can grasp concepts easily, revise quickly, and perform better in exams. Download the PDFs, start studying, and ace your Biology exam with confidence! Happy Learning! ☺ Join Telegram Join WhatsApp Our extensive library of handy and helpful HSC Biology resources including past papers with worked solutions, study guides, study notes, essays written by students, assignments and many more, to help you prepare for the HSC Discover an extensive library of HSC Biology resources like past trial papers, study guides, assignments, study notes, essays created by students and many more. Make the most of your study sessions with our Practice Multiple Choice quizzes. Stay confident and prepared with our quizzes. 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It provides detailed descriptions and examples for each topic.100%(1)100% found this document useful (1 vote)661 views195 pagesThe document discusses various topics related to plant reproduction including asexual reproduction, vegetative propagation, sexual reproduction in flowering plants, structure of anthers and ...AI-enhanced title and description These are HSC Biology Year 12 complete notes. They are in 32 pages covering the Science Stage 6 course - Year 12 Biology (15030). These note cover Modules 5 to 8 in 2 units. These are HSC Biology Year 12 complete notes. They are in 32 pages covering the Science Stage 6 course – Year 12 Biology (15030). These note cover Modules 5 to 8 in 2 units. These HSC Biology notes are the key to a higher rank. This year 12 course consists the 4 models: Module 5 Heredity Module 6 Genetic Change Module 7 Infectious Disease Module 8 Non-infectious Disease and Disorders The Biology Stage 6 Syllabus explores the diversity of life from a molecular to a biological systems level. The course examines the interactions between living things and the environments in which they live. It explores the application of biology and its significance in finding solutions to health and sustainability issues in a changing world. There are 57 lessons in the HSC Study Lab Year 12 Biology course, which corresponds to the 120 indicative hours of study required by the syllabus. Year 12 Biology course (120 hours) Modules Working Scientifically Skills Depth Studies Investigation Module 5 Heredity Module 6 Genetic change Module 7 Infectious disease Module 8 Non-infectious disease and disorders 57 Lessons Video lessons by expert teachers that cover the NSW Year 12 Biology Syllabus comprehensively. The videos fully explain complex biology questions through animations, first-hand investigations (filmed at Macquarie University science labs), and tutorials. Hundreds of practice questions 57 lesson quizzes that include a variety of question types. This course also includes 17 content level and 4 module level tests, as well as an end of course practice exam. 20 Games and simulators The games and simulators help you explore and understand key learning outcomes and put theory into practice. The course also includes additional resources such as an interactive Periodic Table. Working Scientifically Our Working Scientifically activities will look like mini projects at the end of each module (there are four in total in this course). The Working Scientifically activities include virtual interactive experiments, processing of data and/or report writing, depending on the specific requirements of the Working Scientifically outcomes for that module. Each activity will produce a report based on the student's input, that can be downloaded and submitted to their teacher. Depth Studies The course will also feature a student-led Depth Study, which will be a guided template taking them through the steps of conducting an independent scientific study. Again, the Depth Studies section features a downloadable report that the student can use for their reference or submit to their teacher. Sign up to access full resolution videos Sign up to access full resolution videos Sign up to access full resolution videos Sign up to access full resolution videos « Back to subjects Download the app to get CBSE Sample Papers 2024-25, NCERT Solutions (Revised), Most Important Questions, Previous Year Question Bank, Mock Tests, and Detailed Notes. 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Revision notes in exam days is one of the best tips recommended by teachers during exam days. Biotechnology deals with industrial-scale production of bio pharmaceuticals and biological using genetically modified microbes, fungi, plants and animals. It application includes therapeutics, diagnostics, genetically modified crops for agriculture, processed food, bio remediation, waste treatment and energy production. The main three critical research areas of biotechnology includes – Providing the best catalyst in the form of improved organism usually a microbes or pure enzyme. Creating optimal conditions through engineering for a catalyst to act. Downstream processing technologies to purify the protein or organic compounds.Biotechnological Applications in Agriculture- food production can be increased bya) Agro-chemical based agricultureb) Organic agriculturec) Genetically engineered crop-based agriculture. Green revolution successfully increased the food production many folds by using better management practices and use of agrochemicals, fertilizers and pesticides. Further increase in production is not possible by using these methods. To overcome this genetically modified crop is used. Plants, bacteria, fungi and animals whose genes have been altered by manipulation are called Genetically Modified Organisms (GMO). GM plants have many applications- Made crops more tolerant to abiotic stresses Reduced reliance on chemical pesticides Helped to reduce post harvest losses Increased efficiency of mineral usage by plants Enhanced nutritional value of food, eg., Vitamin 'A' enriched rice.Application of Biotechnology in production of pest-resistant plants–Pest resistant plants decrease the amount of pesticides used. Bt toxin is produced by a bacterium called Bacillus thuringiensis.Bt toxin gene has been cloned from the bacteria and been expressed in plants to provide resistance to insects without the need for insecticides; in effect created a bio-pesticide. Examples are Bt cotton, Bt corn, rice, tomato, potato and soyabean etcBt cotton– Bacterium Bacillus thuringiensis produce proteins that kill certain insects like lepidopterens, colepterans (beetels) and dipterans (flies, mosquitoes). B. thuringiensisproduce crystals that contain a toxic insecticidal protein. This toxic protein present in bacterium as inactive protoxins but as soon as insect ingest the inactive form due to alkaline pH of gut, it converted into an active form of toxin and bind to surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually death of insect. The gene from B. thuringiensishas been incorporated into several crop plants like cotton, maize, rice etc. The toxin is coded by a gene named cry. The protein coded by the genes crylAb and cryIIAb control the cotton bollworms, cryIAb controls corn borer.Pest Resistant Plants Nematodes like Meloidegyne incognitia infects the roots of tobacco plants and causes reduction in yield. The infestation of these nematodes can be prevented by the process of RNA interference (RNAi). RNAi is present in all eukaryotic organisms as cellular defence by silencing of specific mRNA due to complementary dsRNA molecules that bind to and prevents translation of the mRNA. The source of complementary dsRNA may be from an infection by viruses having RNA genomes or mobile genetic elements that replicate through RNA intermediate. Nematode specific genes were introduced into host plant using Agrobacterium vectors. The parasite could not survive in a transgenic host expressing specific interfering RNA.Biotechnological Applications in Medicine The rDNA technological processes have made immense impact in the area of healthcare by enabling mass production of safe and more effective therapeutic drugs. At present, about 30 recombinant therapeutics have been approved for human use the world over. In India, 12 of these are presently being marketed.Genetically Engineered Insulin Adult –onset diabetes can be controlled by taking insulin at regular intervals. The main source of this insulin was isolation of insulin from animals. Now a day's insulin can be obtained from bacterium using techniques of biotechnology. Insulin was earlier extracted from pancreas of slaughtered cattle and pigs but insulin from these sources develops allergy or other types of reactions to the foreign protein. Insulin consists of two short polypeptide chains- chain A and chain B, that are linked together by disulphide bridges. In humans, insulin is synthesised as a prohormone, which contains an extra stretch called C peptide, which is absent in mature insulin. The main challenge for production of insulin using rDNA technique was getting insulin assembled into a mature form. An American company, Eli Lilly in 1983 prepared two DNA sequence corresponding to A and B chain of human insulin and introduced them in plasmids of E.coli to produce insulin chain. Chain A and Chain B were produced separately, extracted and combined by creating disulphide bonds to form human insulin.Gene TherapyIt is a collection of methods that allows correction of a gene defect that has been diagnosed in a child or embryo. This method is applied in a person with a hereditary disease. In this method, genes are inserted into a person's cells and tissues to treat a disease. The correction of gene defect involves delivery of a normal gene into the individual or embryo to take over the function of and compensate for non-functional gene. The first clinical gene therapy was done in 1990 to a 4 year old girl with adenosine deaminase (ADA) deficiency. This disorder is caused due to the deletion of the gene for adenosine deaminase that is essential for immune system to function. This defect can be treated by enzyme replacement therapy in which functional ADA is given to the patient by injection or bone marrow transplant. In gene therapy method lymphocytes from the blood of the patient are grown in culture medium outside the body. A functional ADA cDNA is then introduced into these lymphocystes and returned to the patient. In this method periodic infusion of such genetically engineered lymphocytes is needed. If gene isolated from bone marrow cells producing ADA is introduced into cells at early embryonic stages, it could be a permanent cure.Molecular Diagnosis Conventional method of diagnosis such as serum or urine analysis is not able to early detection of disease causing pathogens or virus. Following methods can be used to diagnosed earlier-I. Recombinant DNA technologyII. Polymerase Chain Reaction (PCR)III. Enzyme Linked Immuno-sorbent Assay (ELISA). Symptoms of disease appear only when the concentration of pathogen get increased significantly. Low concentration of bacteria and virus can be detected by amplification of nucleic acid by PCR. It detects the mutation in the gene in cancer patient. PCR is routinely used to detect the HIV in suspected AIDS patients. Genetic disorder can be also detected by using PCR technique. A single stranded DNA or RNA having radioactive molecule is allowed to hybridise to its complementary DNA in a clone of cells followed by detection using autoradiography. The clone having the mutated gene will not appear on the photographic film. ELISA is based on the principle of antigen-antibody interaction. Infection by pathogen can be detected by the presence of antigens like proteins, glycoproteins etc. or by detecting the antibodies synthesised against the pathogen.Transgenic Animals Animals that have had their DNA manipulated to possess and express a foreign gene are known as transgenic animals. Transgenic mice, rats, rabbits, pigs, sheep, cows and fish have been produced. Common reasons for development of transgenic animals-a) Normal physiology and development– they are designed to allow the study of gene regulation, their effect on normal function of body. By introducing genes from other species that alter the formation of this factor and studying eh biological affects that results.b) Study of disease– a number of transgenic animals are designed to increase our understanding of how genes contribute to the development of disease. Transgenic model has been developed for disease like cancer, cystic fibrosis, Alzheimer's disease etc.c) Biological products– .Transgenic animals that produce useful biological products can be created by the introduction of the portion of DNA (gene) which codes for a particular product such as human protein (alpha – 1-antitrypsin) used to treat emphysema. The first transgenic cow, Rosie, produced human protein-enriched milk (alpha-lactalbumin – 2.4 gm / litre).d) Vaccine safety– transgenic mice are developed for used in testing the safety of vaccine before they are used on human. Polio vaccine was tested on transgenic mice and then on monkey.e) Chemical safety testing– transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals. It gives us the results in less time.Ethical Issues:The Indian Government has set up organizations such as GEAC (Genetic Engineering Approval Committee), which will make decisions regarding the validity of GM research and the safety of introducing GM-organisms for public services.Biopatent: A patent is the right granted by a government to an inventor to prevent others from making commercial use of his invention. Now, patents are granted for biological entities and for products derived from biological resources.Biopiracy: It is the term used to refer to the use of bio-resources by multinational companies and other organizations without proper authorization from the countries and people concerned without compensatory payment.In 1997, an American company got patent rights on Basmati rice through the US Patent and Trademark Office. This allowed the company to sell a 'new variety of Basmati, in the US and abroad. This 'new' variety of Basmati had actually been derived from Indian farmer's varieties. Indian Basmati was crossed with semi-dwarf varieties and claimed as an invention or a novelty.Several attempts have also been made to patent uses, products and processes based on Indian traditional herbal medicines, e.g., turmeric and neem. CBSE Class 12 Revision Notes and Key PointsCBSE quick revision note for class 12 Chemistry Physics Maths, Biology and other subject are very helpful to revise the whole syllabus during exam days. The revision notes covers all important formulas and concepts given in the chapter. Even if you wish to have an overview of a chapter, quick revision notes are here to do if for you. 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