

**Chapter 1 : SSC CGL Biology Study Material- Notes MCQ**

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Bacteria that take up gram stain. Bacteria that do not take up gram stain. Cells which lack a well defined nucleus and membrane bound cell organelles. Cells which have a well defined nucleus and membrane bound cell organelles. Transport of molecules across a membrane along the concentration gradient, i. Transport of molecules against concentration gradient, i. A chain like structure formed when several ribosome are attached to a single mRNA. Pleuro Pneumonia Like Organisms. Cell is the structural and functional unit of life. Cell Theory was formulated by Scheleiden and Schwann and was modified by Rudolf virchow states: Prokaryotic cells Genetic material is not enveloped by nuclear envelope. Cell Envelope Prokaryotic cells have a chemically complex cell envelope which consists of a tightly bound 3 layered structure i. Mesosomes help in cell wall formation, DNA replication and distribution to daughter cells, respiration, secretion process, to increase surface area of plasma-membrane and enzymatic content. Bacterial cells may be motile or non-motile. Pili and fimbriae are surface structures which do not play any role in motility. These structures help the bacteria to attach with rocks and the host tissues. Ribosomes are site of protein synthesis. Eukaryotic cells Possess an organized nucleus with nuclear envelope and have a variety of complex locomotory and cytoskeletal structures. According to this the quasi-fluid nature of lipid enables lateral movement of proteins within the overall bilayer Functions: Cell Wall is a non-living rigid structure which gives shape to the cell and protects cell from mechanical damage and infection, helps in cell-to-cell interaction and provides barrier to undesirable macromolecules. Cell wall of algae is made of cellulose, galactans, mannans and minerals like calcium carbonate. Plant cell wall consists of cellulose, hemicellulose, pectins and proteins. Middle lamella is made of calcium pectate which holds neighbouring cells together. Plasmodesmata connect the cytoplasm of neighbouring cells. Endoplasmic Reticulum ER Consists of network of tiny tubular structures. Consists of cisternae stacked parallel to each other. Two faces of the organelle are convex cis or forming face and concave trans or maturing face. Performs packaging of materials, to be delivered either to the intra-cellular targets or secreted outside the cell. Important site of formation of glycoproteins and glycolipids. Membrane bound vesicular structures formed by the process of packaging in the golgi apparatus. Contain hydrolysing enzymes lipases, proteases, carbohydrases which are active in acidic pH. Membrane bound space found in the cytoplasm. Contain water, sap, excretory product, etc. In plants tonoplast single membrane of vacuole facilitates transport of ions and other substances. Contractile vacuole for excretion in Amoeba and food vacuoles formed in protistis for digestion of food. Outer membrane smooth and inner membrane forms a number of infoldings called cristae. Sites of aerobic respiration. It divides by fission. Found in plant cells and in euglenoides. Chloroplasts, chromoplasts and leucoplasts are 3 types of plastids depending on pigments contained. Chloroplasts are double membraned structure. Space limited by inner membrane is called stroma. Flattened membranous sacs called thylakoids in stroma. Chlorophyll pigments are present in thylakoids. Ribosomes Composed of RNA and proteins; without membrane. Eucaryotic ribosomes are 80S. Site of protein synthesis. Cilia and Flagella Cilia are small structures which work like oar, which help in movement. Flagella are longer and responsible for cell movement. They are covered with plasma membrane. Centrosome and Centrioles Centrosome contains two cylindrical structures called centrioles. Surrounded by amorphous pericentriolar material. Centrioles form the basal body of cilia or flagella and spindle fibres for cell division in animal cells. With double membrane; nuclear pores; has chromatin, nuclear matrix and nucleoli site for rRNA synthesis. Chromosomes on basis of position of centromere: Centromere nearer to one end of chromosome. Centromere situated close to its end. Some chromosomes have non-staining secondary constrictions at a constant location, which gives the appearance of small fragment called satellite. We are not responsible for any type of mistake in data. All pdf files or link of pdf files are collected from various Resources Or sent by Students. If any pdf file have any copyright violation please inform us we shell remove that file from our website.

**Chapter 2 : MOHAN SODHA: BIOLOGY NOTES FOR PMT / AIPMT / AIIMS NOTES HINDI MEDIUM**

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Cell membrane and membrane-bound organelles Subcellular components All cells, whether prokaryotic or eukaryotic, have a membrane that envelops the cell, regulates what moves in and out selectively permeable, and maintains the electric potential of the cell. There are also other kinds of biomolecules in cells. This article lists these primary cellular components, then briefly describes their function. Cell membrane Detailed diagram of lipid bilayer cell membrane The cell membrane, or plasma membrane, is a biological membrane that surrounds the cytoplasm of a cell. In animals, the plasma membrane is the outer boundary of the cell, while in plants and prokaryotes it is usually covered by a cell wall. This membrane serves to separate and protect a cell from its surrounding environment and is made mostly from a double layer of phospholipids, which are amphiphilic partly hydrophobic and partly hydrophilic. Hence, the layer is called a phospholipid bilayer, or sometimes a fluid mosaic membrane. Embedded within this membrane is a variety of protein molecules that act as channels and pumps that move different molecules into and out of the cell. Cell surface membranes also contain receptor proteins that allow cells to detect external signaling molecules such as hormones. Cytoskeleton A fluorescent image of an endothelial cell. Nuclei are stained blue, mitochondria are stained red, and microfilaments are stained green. The eukaryotic cytoskeleton is composed of microfilaments, intermediate filaments and microtubules. The subunit of microtubules is a dimeric molecule called tubulin. Intermediate filaments are heteropolymers whose subunits vary among the cell types in different tissues. But some of the subunit protein of intermediate filaments include vimentin, desmin, lamin lamins A, B and C, keratin multiple acidic and basic keratins, neurofilament proteins NF $\alpha$ L, NF $\alpha$ M. Genetic material Two different kinds of genetic material exist: Cells use DNA for their long-term information storage. The biological information contained in an organism is encoded in its DNA sequence. Prokaryotic genetic material is organized in a simple circular bacterial chromosome in the nucleoid region of the cytoplasm. Eukaryotic genetic material is divided into different, [3] linear molecules called chromosomes inside a discrete nucleus, usually with additional genetic material in some organelles like mitochondria and chloroplasts see endosymbiotic theory. A human cell has genetic material contained in the cell nucleus the nuclear genome and in the mitochondria the mitochondrial genome. In humans the nuclear genome is divided into 46 linear DNA molecules called chromosomes, including 22 homologous chromosome pairs and a pair of sex chromosomes. Although the mitochondrial DNA is very small compared to nuclear chromosomes, [3] it codes for 13 proteins involved in mitochondrial energy production and specific tRNAs. Foreign genetic material most commonly DNA can also be artificially introduced into the cell by a process called transfection. Certain viruses also insert their genetic material into the genome. There are several types of organelles in a cell. Some such as the nucleus and golgi apparatus are typically solitary, while others such as mitochondria, chloroplasts, peroxisomes and lysosomes can be numerous hundreds to thousands. The cytosol is the gelatinous fluid that fills the cell and surrounds the organelles. The central and rightmost cell are in interphase, so their DNA is diffuse and the entire nuclei are labelled. The cell on the left is going through mitosis and its chromosomes have condensed. The nucleus is spherical and separated from the cytoplasm by a double membrane called the nuclear envelope. This mRNA is then transported out of the nucleus, where it is translated into a specific protein molecule. The nucleolus is a specialized region within the nucleus where ribosome subunits are assembled. In prokaryotes, DNA processing takes place in the cytoplasm. Mitochondria are self-replicating organelles that occur in various numbers, shapes, and sizes in the cytoplasm of all eukaryotic cells. Mitochondria multiply by binary fission, like prokaryotes. Diagram of the endomembrane system Endoplasmic reticulum: The endoplasmic reticulum ER is a transport network for molecules targeted for certain modifications and specific destinations, as compared to molecules that float freely in the cytoplasm.

The ER has two forms: The primary function of the Golgi apparatus is to process and package the macromolecules such as proteins and lipids that are synthesized by the cell. Lysosomes contain digestive enzymes acid hydrolases. They digest excess or worn-out organelles, food particles, and engulfed viruses or bacteria. Peroxisomes have enzymes that rid the cell of toxic peroxides. The cell could not house these destructive enzymes if they were not contained in a membrane-bound system. The centrosome produces the microtubules of a cell – a key component of the cytoskeleton. It directs the transport through the ER and the Golgi apparatus. Centrosomes are composed of two centrioles, which separate during cell division and help in the formation of the mitotic spindle. A single centrosome is present in the animal cells. They are also found in some fungi and algae cells. Vacuoles sequester waste products and in plant cells store water. They are often described as liquid filled space and are surrounded by a membrane. Some cells, most notably Amoeba, have contractile vacuoles, which can pump water out of the cell if there is too much water. The vacuoles of plant cells and fungal cells are usually larger than those of animal cells. Eukaryotic and prokaryotic Ribosomes: The ribosome is a large complex of RNA and protein molecules. Ribosomes can be found either floating freely or bound to a membrane the rough endoplasmic reticulum in eukaryotes, or the cell membrane in prokaryotes. These structures are notable because they are not protected from the external environment by the semipermeable cell membrane. In order to assemble these structures, their components must be carried across the cell membrane by export processes. Cell wall Further information: Cell wall Many types of prokaryotic and eukaryotic cells have a cell wall. The cell wall acts to protect the cell mechanically and chemically from its environment, and is an additional layer of protection to the cell membrane. Different types of cell have cell walls made up of different materials; plant cell walls are primarily made up of cellulose, fungi cell walls are made up of chitin and bacteria cell walls are made up of peptidoglycan. Prokaryotic Capsule A gelatinous capsule is present in some bacteria outside the cell membrane and cell wall. The capsule may be polysaccharide as in pneumococci, meningococci or polypeptide as Bacillus anthracis or hyaluronic acid as in streptococci. Capsules are not marked by normal staining protocols and can be detected by India ink or methyl blue; which allows for higher contrast between the cells for observation. The bacterial flagellum stretches from cytoplasm through the cell membrane and extrudes through the cell wall. They are long and thick thread-like appendages, protein in nature. A different type of flagellum is found in archaea and a different type is found in eukaryotes. Fimbria A fimbria also known as a pilus is a short, thin, hair-like filament found on the surface of bacteria. Fimbriae, or pili are formed of a protein called pilin antigenic and are responsible for attachment of bacteria to specific receptors of human cell cell adhesion. There are special types of specific pili involved in bacterial conjugation. Cellular processes Prokaryotes divide by binary fission, while eukaryotes divide by mitosis or meiosis. Cell division Cell division involves a single cell called a mother cell dividing into two daughter cells. This leads to growth in multicellular organisms the growth of tissue and to procreation vegetative reproduction in unicellular organisms. Prokaryotic cells divide by binary fission, while eukaryotic cells usually undergo a process of nuclear division, called mitosis, followed by division of the cell, called cytokinesis. A diploid cell may also undergo meiosis to produce haploid cells, usually four. Haploid cells serve as gametes in multicellular organisms, fusing to form new diploid cells. This occurs during the S phase of the cell cycle. In meiosis, the DNA is replicated only once, while the cell divides twice. DNA replication only occurs before meiosis I. DNA replication does not occur when the cells divide the second time, in meiosis II. This RNA is then subject to post-transcriptional modification and control, resulting in a mature mRNA red that is then transported out of the nucleus and into the cytoplasm peach, where it undergoes translation into a protein. Newly synthesized proteins black are often further modified, such as by binding to an effector molecule orange, to become fully active. Cell growth and Metabolism Between successive cell divisions, cells grow through the functioning of cellular metabolism. Cell metabolism is the process by which individual cells process nutrient molecules. Metabolism has two distinct divisions: Complex sugars consumed by the organism can be broken down into simpler sugar molecules called monosaccharides such as glucose. Once inside the cell, glucose is broken down to make adenosine triphosphate ATP, [3] a molecule that possesses readily available energy, through two different pathways. Protein synthesis Main article: Protein biosynthesis Cells are capable of synthesizing new proteins, which are essential for the modulation and

maintenance of cellular activities. Protein synthesis generally consists of two major steps: The ribosome mediates the formation of a polypeptide sequence based on the mRNA sequence. The new polypeptide then folds into a functional three-dimensional protein molecule. Motility Unicellular organisms can move in order to find food or escape predators. Common mechanisms of motion include flagella and cilia. In multicellular organisms, cells can move during processes such as wound healing, the immune response and cancer metastasis. For example, in wound healing in animals, white blood cells move to the wound site to kill the microorganisms that cause infection. Cell motility involves many receptors, crosslinking, bundling, binding, adhesion, motor and other proteins. Each step is driven by physical forces generated by unique segments of the cytoskeleton.

**Chapter 3 : Hindi - About Biology, Biology General Knowledge / Biology Quiz in Hindi**

*As per the latest news, Madhya Pradesh Board department is planning to release MP Board 12th Result on the official web portal very soon. Once the result declared on the official website then after candidates can check it from other website also.*

It not only deals with various plants but also gives us information about animals and human beings. The structure, growth, function of any living creature and other relevant things are included in this subject. This subject comes under natural science and it imparts information about cell, genes, evolution and others. Moreover, this subject has many branches and sub-disciplines and each of these gives specific information to students. For instance, botany is a well-known sub-discipline and it deals with the biology of various plants. Moreover, many colorful images, diagrams are added in each biology syllabus to give students detailed knowledge in each topic. Some other branches of biology are anatomy, bioengineering, astrobiology, cell biology, ecology, environmental biology and others. Students learn this subject from their elementary classes as some biology topics are added in each science syllabus. This subject is interesting as it not only gives theoretical information, but also gives the practical knowledge of each concept. Students usually start learning some basic biology topics in the junior classes. Leaves in our life and animals, some creepy crawlies and flyers are some basic topics that students generally learn to get more familiar with their surroundings. Moreover, students can get online biology notes for each class and these are designed by the proficient subject experts. Free biology notes are also available online. After completion of the syllabus, students are suggested to follow these notes to clear their doubts in a systematic manner. Additionally, by using these online study materials, students can thoroughly revise each chapter included in each syllabus. These are quite useful for the students of class 11 and 12. Additionally, these online documents are easy accessible and hence, students can collect these at their convenient time. Apart from this, online biology sessions are also available and these sessions are effective and constructive in all manners. In these sessions, students can interact with the virtual tutor and learn each topic in a step-by-step manner. Moreover, these sessions are one-on-one sessions and most importantly, students can take these sessions as per their learning requirements. Practicing several sets of biology worksheets is a good way to get more convenient with the prescribed curriculum. These worksheets are systematically designed and hence, students feel convenient to follow these. Moreover, students can collect these worksheets online. By using these worksheets, they can practice different types of biology questions. In this way, they can not only brush up their knowledge, but also enhance their confidence level before exams. Having been current for over years, they were issued for longer than any other form of U. They were known popularly as "greenbacks" in their heyday, a name inherited from the Demand Notes that they replaced in 1862. They were called United States Notes by the First Legal Tender Act, which authorized them as a form of fiat currency, but because their value derives from their status as legal tender they bear the inscription "This Note is a Legal Tender" and are often called Legal Tender Notes. They were originally issued directly into circulation by the U. Treasury to pay expenses incurred by the Union during the American Civil War. Over the next century, the legislation governing these notes was modified many times and numerous versions have been issued by the Treasury. United States Notes that were issued in the large-size format, prior to 1875, differ dramatically in appearance when compared to modern American currency, but those issued in the small-size format, starting in 1875, are very similar to contemporary Federal Reserve Notes with a marked distinction of having a red U. Treasury Seal in place of a green one. Whereas issuance of United States Notes ended in January 1909, existing United States Notes are still valid currency in the United States, though extremely rarely seen in circulation, given that paper money currently consists almost exclusively of Federal Reserve Notes. History Demand Notes During 1862, the opening year of the American Civil War, the expenses incurred by the Union Government far outstripped its limited revenues from taxation, and borrowing was the main vehicle for financing the war. These Demand Notes were paid out to creditors directly and used to meet the payroll of soldiers in the field. While issued within the legal framework of Treasury Note Debt, the Demand Notes were intended to circulate as currency and were of the same size, and in appearance, closely resembled banknotes.



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1 Cell Biology A cell is chemical system that is able to maintain its structure and reproduce. Cells are the fundamental unit of life. All living things are cells or composed of cells.

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procedures used in molecular biology including gene cloning, PCR and sequence analysis. These lecture notes approximately follow the course and are divided into four sections: 1) General Biochemical and Biophysical Methods (Chapters ), 2) Analysis and.

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