Chapter 5 - The Fundamental Unit of Life

Periodic Test

Q.1. Where are protein synthesised inside the cell?

Answer: Ribosomes

Endoplasmic reticulum is a network of branching tubules that extends from the cell membrane to the nuclear membrane of the cell. Attached to the surface of the rough endoplasmic reticulum are round particles called the ribosomes inside which proteins are synthesized.

Q.2. Where do the lipids and proteins constituting the cell membrane get synthesized?

Answer: The lipids and proteins that constitute the cell membrane get synthesized in the Endoplasmic reticulum (ER) of the cell. This ER is divided into two types: i) Rough ER & ii) Smooth ER.

Attached to the surface of the Rough ER are round particles called the ribosomes inside which proteins are synthesized. The lipids are synthesized inside the Smooth ER.

Q.3. What is protoplasm? Who coined this term and when?

Answer: The fluidic substance in the cell in which all the organelles of the cell reside and which is surrounded by the cell membrane is called as the protoplasm of the cell. The term 'protoplasm' was first coined by Purkinge in 1839.

Q.4. What is the main function of vacuole in plants and animals?

Answer: The main function of vacuoles is the storage of many important molecules like amino acids, sugars, various organic acids, and some proteins. In plants, the vacuoles are very large in size and filled with cell sap that helps to maintain the turgidity and rigidity of the cell. In animals, the vacuoles are very small in size and also possess the function of storage.

Q.5. What name is given to the functional segments of DNA?

Answer: The functional segments of the DNA are known as genes. These functional segments or genes contain information for the synthesis of proteins in living cells.

Q.6. Give Reasons for the Following:

Why is the cell called the structural and functional unit of life?

Answer: The body or structure of any living organism is made up of cells. These cells are also responsible for carrying out all the metabolic and regulatory functions in an

organism. Due to these attributes, the cell is called the structural and functional unit of life.

Q.7. Give Reasons for the Following:

Why is the plasma membrane called a selectively permeable membrane?

Answer: A selectively permeable membrane is the one which allows only certain molecules to pass through it. The plasma membrane of a cell is also a selectively permeable membrane as it permits some materials to pass through it and also prevents the movement of certain materials, in and out of the cell.

Q.8. Give Reasons for the Following:

Why are lysosomes known as suicide-bags?

Answer: Lysosomes are membrane bound cell organelles that keep the cell clean by digesting unwanted substances. Lysosomes are filled with digestive enzymes that break down the unwanted harmful substances and organisms like bacteria. Sometimes, when the cell is damaged, the lysosomes burst open and the digestive enzymes digest or destroys its own cell. This is why they known as suicide-bags.

Q.9. Give Reasons for the Following:

Why mitochondria are known as powerhouse of the cell?

Answer: Mitochondria are double membrane bound organelles inside a cell. They produce the energy that the cell requires for its day to day cellular processes. This energy is produced in the inner membrane of the mitochondria in the form of ATP which acts as a currency of energy inside the cell. Due to this energy producing function of the mitochondria, it is called the power house of the cell.

Q.10. Give Reasons for the Following:

Why is it said that, “a cell without a nucleus is without any future”?

Answer: The genetic material or DNA is present inside the nucleus in the form of chromosomes. Only when this DNA replicates, does the cell divide to form new cells. The functional units of this DNA, also known as genes, are responsible for the synthesis of proteins. Thus, the nucleus is very important for cellular reproduction and all the other developmental processes of a cell, without which the cell cannot have a stable future. Due to this it said that, “a cell without a nucleus is without any future.”

Q.11. Give four differences between prokaryotic and eukaryotic cell.

Answer:

PROKARYOTIC CELL	EUKARYOTIC CELL
Generally smaller in size than the eukaryotic cell (1-10μm)	Larger in size than the prokaryotic cell (5-100μm)
Membrane bound organelles are absent.	Membrane bound organelles are present.
The chromosome is singular.	More than one chromosomes are present.
The nuclear region is not very well defined and is called as the nucleoid.	The nuclear region is very well defined in form of separate membrane bound organelle called as the nucleus.

Q.12. Differentiate between osmosis and diffusion.

Answer:

OSMOSIS	DIFFUSION
Osmosis involves the movement of the solvent from a lower concentration of solute to a higher concentration of solute.	Diffusion involves the movement of molecules from a higher concentration of solute to a lower concentration of solute.
Osmosis takes place across a semi permeable membrane.	Diffusion can occur without a semi permeable membrane.
Eg: Dried raisins when kept in water swell up due to water entering the raisin cells via osmosis.	Eg: Oxygen enters the cell via diffusion when the level of oxygen decreases inside the cell.

Q.13. How vacuoles in plant cells differ from those in animal cells?

Answer:

PLANT VACUOLES	ANIMAL VACUOLES
The size of vacuoles in plants is very large.	The size of vacuoles in animals is very small.
The main function of plant vacuoles is to store plant sap and maintain the turgidity and rigidity of the plant cell.	The main function of animal vacuoles is to store nutrients, ions and water.

Q.14. Give differences between plant cell and an animal cell.

Answer:

PLANT CELL	ANIMAL CELL
Plant cells are relatively larger in size.	Animal cells are relatively smaller in size.
The cell membrane is surrounded by a cell wall in plant cells.	Cell wall is absent in animal cells.
Plastids like chloroplast are present in plant cells.	Plastids are absent in animal cells.
The vacuoles are very large in size.	The vacuoles are very small in size.
Centrioles are absent in plant cells	Centrioles are present in animal cells.

Q.15.A. What is the basic difference between:

Ribosome and Lysosome.

Answer: Ribosome and Lysosome

RIBOSOME	LYSOSOME
Ribosomes are small circular particles attached to the Endoplasmic reticulum.	Lysosomes are membrane bound organelles are found in the cytoplasm.
Proteins are synthesized inside the ribosomes.	Lysosomes are filled with digestive enzymes that digest unwanted substances in the cell.

Q.15.B. What is the basic difference between:

Cell wall and plasma membrane.

Answer: Cell wall and Plasma membrane.

CELL WALL	PLASMA MEMBRANE
Cell wall is present only in plant cells.	Plasma membrane is present in both plant and animal cells.
Cell wall is composed of cellulose which provides structural strength to the plant cell.	Plasma membrane is made up of proteins and lipids which either allow or permit the entry of molecules in and out of the cell.

Q.16.A. How do substances like CO_2 and water move in and out of the cell? Discuss.

Answer: i) Substances like CO_2 and water move in and out of the cell via the phenomenon of diffusion and osmosis respectively.

ii) Gases like CO_2 are very small and hence can easily diffuse through the plasma membrane. However, the concentration of such gases on the inside and outside of the cell plays a very important role in their movement. Gases move from a region of higher concentration to a region of lower concentration.

iii) Generally, the concentration of CO_2 inside the cell is higher than the outside. This makes the CO_2 diffuse from the inside of the cell to the outside. When the concentration of CO_2 becomes higher on the outside, the CO_2 simply diffuses from the outside of the cell to the inside.

iv) In case of water, the movement occurs as a result of osmosis. Water moves from a region of lower solute concentration to a region of higher solute concentration.

v) When concentration of water is more on the outside of the cell, the water will move from the outside to the inside of the cell. This occurs as the inside of the cell has less water than the outside but has more concentration of solutes.

Q.16.B. What would happen to the life of a cell if there was no golgi apparatus?

Answer: i) The Golgi complex is necessary for the transport of various bio molecules synthesized in the Endoplasmic reticulum.

ii) Along with the function of transportation, the Golgi complex also aids in the conversion of many molecules like simple sugars into complex sugars.

iii) Lysosomes, which digest the unwanted materials in the cell are also synthesized by the Golgi complex.

iv) Thus, without the Golgi apparatus, the cell would not survive as there would be no conversion and transportation of biomolecules and the cell would get infected by foreign particles as the lysosomes would not be functional.

Q.17. What may happen to the size of the cell if it is placed in such solutions which vary in their concentration:

i. When placed in Hypotonic solution.

ii. When placed in Hypertonic solution.

iii. When placed in Isotonic solution.

Answer: i) When placed in Hypotonic solution:

The size of the cell will increase when placed in a hypotonic solution. This occurs due to the phenomenon of osmosis or endosmosis, wherein the water moves towards a highly concentration solution. Hypotonic solution is not very concentrated and hence water

moves away from this hypotonic solution towards the inside of the cell which is more concentrated causing the cell to swell.

ii) When placed in a Hypertonic solution:

The size of the cell will decrease when placed in a hypertonic solution. This occurs due to the phenomenon of osmosis or exosmosis, wherein the water moves towards a highly concentration solution. Hypertonic solution is very concentrated and hence water moves towards this hypertonic solution from the inside of the cell which is less concentrated to the outside which is more concentrated causing the cell to shrink.

iii) When placed in an isotonic solution:

The size of the cell remains the same when placed in an isotonic solution. This is because both the inside and outside of the cell are in the same concentration. Hence, there is no need for the water to move in either direction as equilibrium is already achieved.

Q.18.A. What would happen to the life of a cell if the plasma membrane ruptures or breaks down?

Answer: i) The plasma membrane separates the inside of a cell from the outside environment. It also controls the movement of various molecules in and out of the cell.

ii) If the plasma membrane ruptures then the osmotic balance of the cell is disturbed. This means that any molecule can leave or enter the cell which damages the balance of the constituents inside a cell.

iii) The protective wall between the outside and inside of a cell is destroyed and hence the integrity of the cell breaks down which causes the death of a cell.

Q.18.B. How does an Amoeba obtain its food?

Answer: i) Amoeba is a unicellular organism. It obtains its food by a process known as endocytosis.

ii) In endocytosis, the plasma membrane extends outwards to engulf the particles on the outside.

iii) In amoeba, the plasma membrane also engulfs the food particles on the outside and takes it inside the cell via endocytosis.

Q.19.A. What is nucleoid?

Answer: i) Prokaryotic are very primitive in nature. They do not consist of well-defined cell organelles.

ii) In prokaryotes, the genetic material is not present in a defined state. It is irregularly concentrated in a particular region.

iii) This irregularly concentrated region of genetic material inside a prokaryotic cell is known as nucleiod.

Q.19.B. What does chromosome contain?

Answer: i) The genetic material in eukaryotic cells is compactly arranged in a well-defined state in the form of chromosomes.

ii) Chromosomes consist of tightly coiled DNA molecules along with certain types of proteins that help in the condensation of these DNA molecules into a chromosome.

iii) These chromosomes are clearly visible during cell division.

Q.19.C. What is the function of chromatin material?

Answer: i) Chromatin material is the genetic material of a cell consisting of DNA.

ii) Whenever the cell is about to divide, the chromatin gets condensed to form the chromosomes.

iii) The various functions of the chromatin include the packaging of DNA material in a more compact state for the cellular reproduction and regulate gene expression for the synthesis of proteins.

Q.20.A. Why do grass look green, papaya yellow and edible part of watermelon red?

Answer: i) The colour of any plant depends on the pigments present inside that plant cell.

ii) The grass appears green due to the presence of chlorophyll which is a green coloured pigment present in the chloroplasts of the grass leaves.

iii) The papaya fruit appears yellow as it contains many chromoplasts which are filled with yellow coloured pigments like xanthophylls.

iv) The inside of a watermelon appears red in colour due to presence of the red coloured pigment known as lycopene in the edible part of the watermelon.

Q.20.B. It is generally said that 'Golgi apparatus works in coordination with Endoplasmic reticulum'. Explain how.

Answer: i) Endoplasmic reticulum is a network of branching tubules that is involved in the protein and lipid synthesis of the cell.

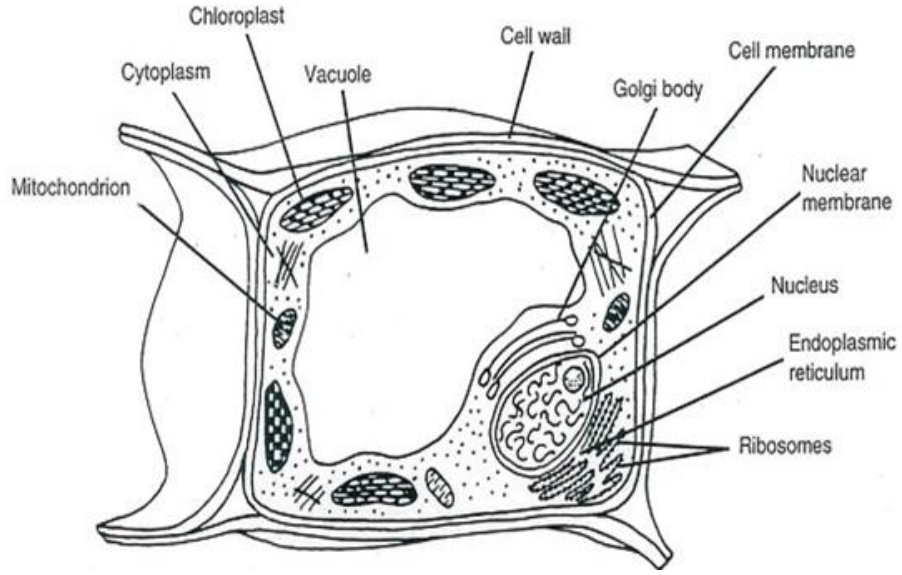
ii) The Golgi complex is a system of membrane bound vesicles that functions in the storage and transportation of various biomolecules via its vesicles.

iii) The Golgi complex works in coordination with the endoplasmic reticulum.

iv) The bio molecules like proteins and lipids that are synthesized by the endoplasmic reticulum are transferred to the Golgi complex where they are processed, stored and then transported to the other parts of the cells where they are required.

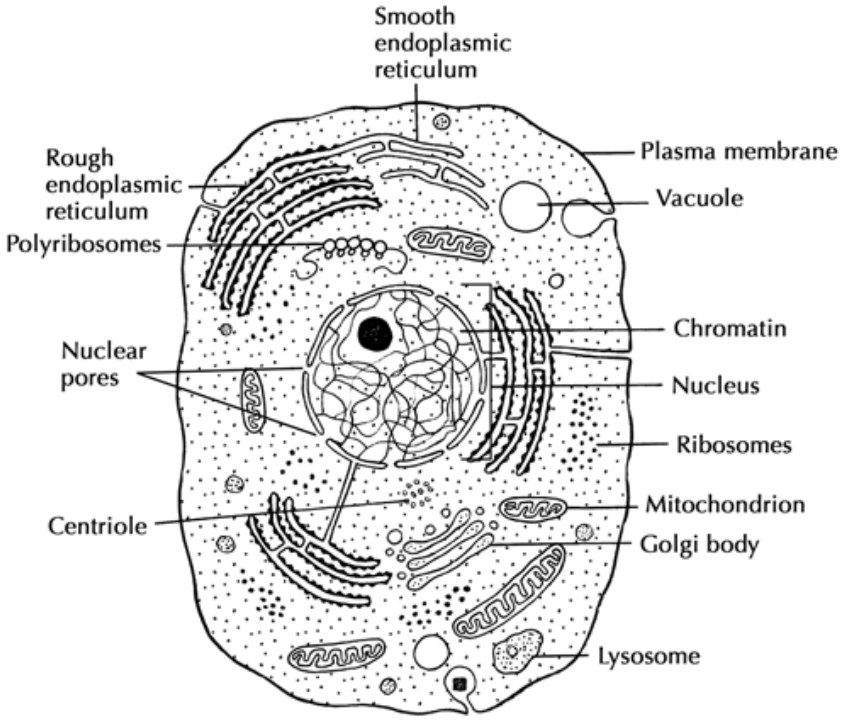
Q.21. Draw a diagram of a plant cell and Label at least eight important organelles in it.

Answer:



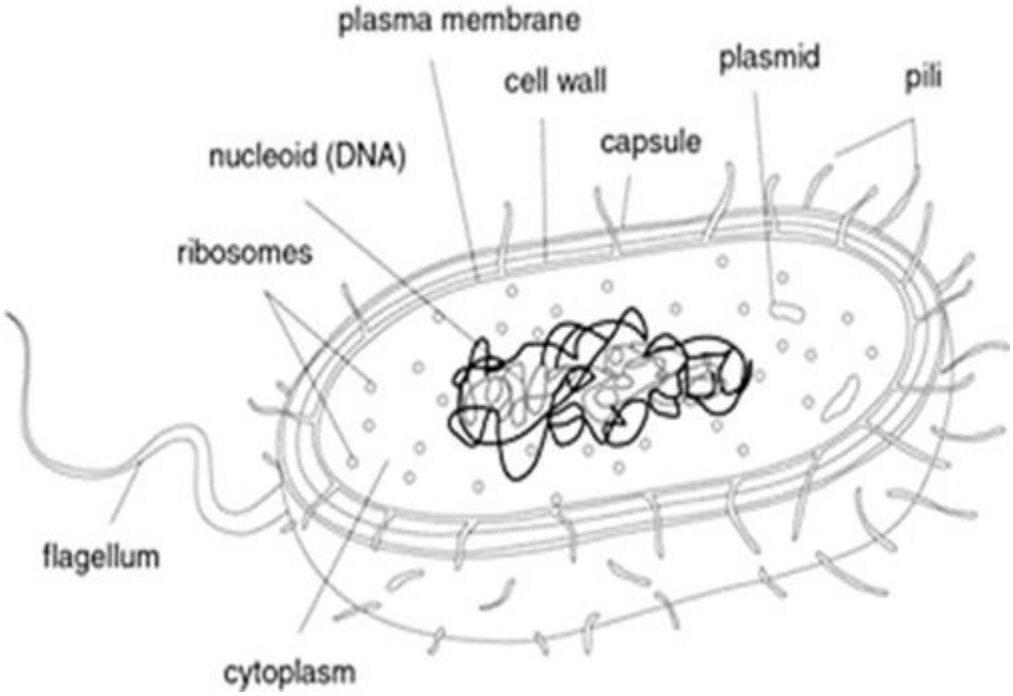
Q.22. Draw a diagram of an animal cell and label at least eight organelles in it.

Answer:



Q.23. Draw a diagram of a prokaryotic cell and label at least four parts in it.

Answer:



Q.24. What happens when egg is first put hydrochloric acid for sometimes and then placed in a concentrated salt solution?

Answer: i) When the egg is first put in hydrochloric acid for some time, the egg cell which is made up of calcium carbonates, reacts with the acid and dissolves.

ii) When the same de-shelled egg is placed in a concentrated salt solution, the egg will shrink because of osmosis. Since, the concentrated salt solution is hypertonic, water will flow from inside the egg (lower salt concentration) to the outside (higher salt concentration). This will make the egg shrink.

Q.25. What happens when raisins are placed in:

(a) Water at room temperature

(b) Water at 4°C

(c) Concentrated sugar solution.

Answer: a) When raisins are placed in water at room temperature, the raisins will swell up as the water enters the cells of the raisins. This happens due to osmosis. The concentration of water is higher on the outside than on the inside of the raisins.

b) When raisins are places in water at 4°C, they will swell up as the water enters the cells due to osmosis. But, due to the low temperature, the rate at which water enters the raisins is slower than that at room temperature.

c) When raisins are placed in a concentrated sugar solution, the raisins will wilt and shrink. This is due to osmosis or exosmosis, wherein the water moves from the inside of the cell (less concentrated) to the outside which is more concentrated with sugar.

Q.26. Where can you find the following structures:

A. Chromoplast

B. Nucleoid

C. Cell wall

D. Golgi apparatus

E. Centrioles

F. Dictyosomes.

Answer: The following structures can be found in:

A. Chromoplast: In the Plant cell cytoplasm.

B. Nucleoid: In a Prokaryotic cell.

C. Cell wall: In a plant cell, surrounding the cell membrane.

D. Golgi apparatus: In a Eukaryotic cell, close to the endoplasmic reticulum.

E. Centrioles: In an animal cell.

F. Dictyosomes: In the plant cell.

Comprehensive Exercises (MCQ)

Q.1. Cell secretions are done by:

A. Golgi apparatus

B. Rough Endoplasmic Reticulum

C. Smooth Endoplasmic Reticulum

D. Lysosomes

Answer: The Golgi complex is a flat membrane bound apparatus with vesicles that secrete chemicals required by the cell. The smooth and rough Endoplasmic Reticulum are engaged in lipid and protein synthesis respectively whereas the lysosomes store digestive enzymes in them.

Q.2. In the cell, complex sugars are made from simple sugars by:

A. Nucleolus

B. Mitochondria

C. Golgi Apparatus

D. Endoplasmic Reticulum

Answer: The Golgi apparatus is involved in making complex sugars. The other 3 choices are incorrect as the nucleus contains the genetic material of the cell, mitochondria provides the energy for the cellular activities and the Endoplasmic Reticulum is involved in protein an d lipid synthesis.

Q.3. The cell organelles having their own DNA and ribosomes are:

A. Endoplasmic Reticulum and Lysosomes

B. Mitochondria and Plastids

C. Golgi Apparatus and Plastids

D. Golgi Apparatus and Mitochondria

Answer: Mitochondria and Plastids like Chloroplast have their own DNA and ribosomes because of which they are able to synthesize some of their own proteins.

Q.4. Which of the following can be made into crystal?

A. A Bacterium

B. An Amoeba

C. A Virus

D. A Sperm

Answer: Virus can remain outside the host as a nonliving entity in the form of a crystal and hence it can be crystallized. Other cells like the bacterium, amoeba and sperm are living entities and cannot be easily crystallized.

Q.5. A cell will swell up if:

A. The concentration of water molecules in the cell is higher than the concentration of water molecules in surrounding medium

B. The concentration of water molecules in surrounding medium is higher than water molecules concentration in the cell

C. The concentration of water molecules is same in the cell and in the surrounding medium

D. Concentration of water molecules does not matter

Answer: If the water concentration inside the cell is higher, it means that the concentration of solutes will be lesser inside the cell as compared to the outside where the water concentration is lower. Due to osmosis, the water will move inside the cell and hence the cell will swell.

Q.6. Chromosomes are made-up of:

A. DNA

B. Protein

C. DNA and Protein

D. RNA

Answer: The chromosomes are made of tightly compacted DNA molecules. These DNA molecules are kept in a compact state with help of certain proteins. Hence, the chromosomes are made up of both DNA and Proteins.

Q.7. Which of these options are not a function of Ribosomes?

(i) It helps in manufacture of protein molecules

(ii) It helps in manufacture of enzymes

(iii) It helps in manufacture of hormones

(iv) It helps in manufacture of starch molecules

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (iv) and (i)

Answer: Ribosomes are involved in protein synthesis. Starch is not produced by ribosomes as plastids are involved in the production of starch.

Q.8. Plasmolysis is a plant cell is defined as:

A. Breakdown (lysis) of plasma membrane in hypotonic medium

B. Shrinkage of cytoplasm in hypertomic medium

C. Shrinkage of nucleoplasm

D. None of them

Answer: When a plant cell is kept in a hypertonic solution, the water inside the cell moves outside due to osmosis and this causes the cytoplasm to shrink. This phenomenon is known as plasmolysis.

Q.9. Which of the following are covered by a single membrane?

A. Mitochondira

B. Vacuole

C. Lysosome

D. Plastid

Answer: The vacuole is covered by a single membrane. All the others are double membrane structures.

Q.10. Find out the false sentences

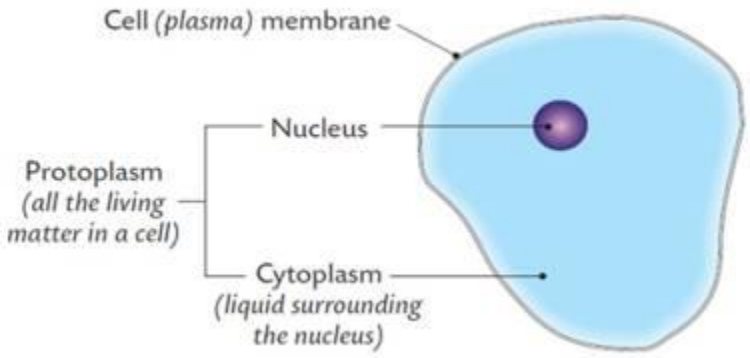
A. Golgi apparatus is involved with the formation of lysosomes.

B. Nucleus, mitochondria and plastid have DNA; hence they are able to make their own structural proteins

C. Mitochondria is said to be the powerhouse of the cell as ATP is generated in them

D. Cytoplasm is called as protoplasm

Answer:



Option D is incorrect because, cytoplasm is not called as protoplasm but it is a part of protoplasm.

The protoplasm consists of cytoplasm, nucleus and the cell membrane.

Q.11. The cell organelle in which materials such as starch, oils and protein granules are stored is:

A. Golgi apparatus

B. Chloroplasts

C. Chromoplasts

D. Leucoplasts

Answer: Leucoplasts are involved with the storage of fats, oils and protein granules in plants. All the other organelles are involved in the function of synthesis rather than storage.

Q.12. Functional segments of DNA are called:

A. RNA

B. Ribosomes

C. Genes

D. Chromosomes

Answer: Genes are the functional units of DNA that contain information for the synthesis of proteins. RNA is a different nucleic acid made by using DNA, Ribosomes are the site for protein synthesis and chromosomes are a compact structure of DNA molecules.

Q.13. The Endoplasmic Reticulum membrane is similar in structure to the:

A. Nuclear membrane

B. Plasma membrane

C. Mitochondrial membrane

D. Membranes in plastids

Answer: Just as the plasma membrane separates the cellular cytoplasm from the outside, the membrane of endoplasmic reticulum separates the inner content of the ER from the cellular cytoplasm.

Q.14. In addition to green pigment chlorophyll, chloroplasts also contain two other pigments. These are:

A. Yellow or orange pigments

B. Yellow or blue pigments

C. Blue or orange pigments

D. Red or brown pigments

Answer: In addition to chlorophyll, chloroplasts contain the yellow or orange pigments known as carotenes.

Q.15. 1µm is:

A. 10^{-6} m

B. 10^{-9} m

C. 10^{-10} m

D. 10^{-3} m

Answer: 10^{-6} m

Q.16. Lysosome arises from:

A. Endoplasmic reticulum

B. Golgi apparatus

C. Nucleus

D. Mitochondria

Answer: The vesicles of the Golgi complex are involved in the formation of lysosomes.

Q.17. Living cells were discovered by:

A. Robert Hooke

B. Purkinje

C. Leeuwenhoek

D. Robert Brown

Answer: Leeuwenhoek in 1674 discovered free living cells in pond water for the first time using a new improved microscope.

Q.18. Select the odd one out:

A. The movement of water across a semi permeable membrane is affected by the amount of substances dissolved in it.

B. Membranes are made of organic molecules like proteins and lipids

C. Molecules soluble in organic solvents can easily pass through the membrane.

D. Plasma membranes contain chitin sugar in plants

Answer: Rest all the statements are true. Plasma membrane contains cellulose sugar in plants and not chitin.

Q.19. Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell?

A. Golgi apparatus

B. Lysosomes

C. Smooth endoplasmic reticulum

D. Vacuoles

Answer: The Smooth endoplasmic reticulum does not consist of ribosomes. They are abundant in liver cells which is the main organ for detoxification and hence play a crucial role in detoxifying many poisons and drugs. All the other organelles are not abundant in liver cells.

Q.20. The proteins and lipids, essential for building the cell membrane, are manufactured by:

A. Rough endoplasmic reticulum

B. Golgi apparatus

C. Plasma membrane

D. Mitochondria

Answer: The Rough endoplasmic reticulum is involved in the synthesis of proteins and the Smooth endoplasmic reticulum is involved in the synthesis of lipds. All the other organs do not synthesize these molecules and have different functions.

Q.21. The undefined nuclear region of prokaryotes are also known as:

A. Nucleus

B. Nucleolus

C. Nucleic acid

D. Nucleoid

Answer: Prokaryotes do not contain proper cell organelles and hence the nuclear material is just accumulated indefinitely in a region known as Nucleoid. Nucleus and Nucleolus are found in Eukaryotic cells whereas Nucleic acid is a component of DNA.

Q.22. The cell organelle involved in forming complex sugars from simple sugars are:

A. Endoplasmic reticulum

B. Ribosomes

C. Plastids

D. Golgi apparatus

Answer: Golgi apparatus are involved in the formation of complex sugars. The Endoplasmic reticulum is associated with the synthesis of proteins and lipids, ribosomes as part of the endoplasmic reticulum, synthesize proteins and the plastids are involved in the synthesis of carbohydrates.

Q.23. Which out of the following is not a function of vacuole?

A. Storage

B. Providing turgidity and rigidity to the cell

C. Waste excretion

D. Locomotion

Answer: Vacuoles are single membrane bound cell organelles that are involved in storage, maintaining cell structure and waste excretion. It does not aid the cell in locomotion.

Q.24. Amoeba acquires its food through a process, termed:

A. Exocytosis

B. Endocytosis

C. Plasmolysis

D. Exocytosis and endocytosis both

Answer: Endocytosis is the process of engulfing food particles from the outside through the cell membrane. Exocytosis is the process of removing particles out of the cell and plasmolysis is a phenomenon associated with plant cells.

Q.25. Cell wall of which one of these is not made-up of cellulose?

A. Bacteria

B. Hydrilla

C. Mango tree

D. Cactus

Answer: The cell wall of bacteria is made up of peptidoglycan. The cell walls of the other three are made up of cellulose.

Q.26. The plastids which are coloured, green and colourless are known respectively as:

A. Chloroplasts, Chromoplasts, Leucoplasts

B. Chromoplasts, Leucoplasts, Chloroplasts

C. Leucoplasts, Chloroplasts, Chromoplasts

D. Chromoplasts, Chloroplasts, Leucoplasts

Answer: Plastids are organelles that synthesize and store various molecules and are generally pigmented. Chromoplasts have colorful pigments, Chloroplasts have green pigment through which they undergo photosynthesis and Leucoplasts do not have any pigments.

Q.27. In a non-dividing cell, DNA is present as part of chromatin material which can be seen as:

A. Entangled mass of thread like structures

B. Thick rod like structures

C. Fine Granules

D. Crystalline structures

Answer: When the cell is not undergoing division, the DNA is in a non-replicated state as it does not need to be condensed for cellular reproduction.

Q.28. Purkinje identified the fluid substance of the cell and named it as:

A. Nucleolus

B. Cytoplasm

C. Protoplasm

D. Nucleoplasm

Answer: Purkinge in 1839 coined the term protoplasm for the fluid substance of the cell.

Q.29. Silver nitrate solution is used to study:

A. Endoplasmic reticulum

B. Golgi apparatus

C. Nucleus

D. Mitochondria

Answer: Camillo Golgi was the first one to use silver nitrate to study the Golgi apparatus. A weak solution of silver nitrate is very effective in tracing the various cellular processes along with the delicate changes of the cell.

Q.30. Organelle other than nucleus, containing DNA is:

A. Endoplasmic reticulum

B. Golgi apparatus

C. Mitochondria

D. Lysosome

Answer: Mitochondria contain their own DNA due to which they are able to synthesize some of their own proteins. The other organelles are unable to do so.

Q.31. Kitchen of the cell is:

A. Mitochondria

B. Endoplasmic reticulum

C. Chloroplast

D. Golgi apparatus

Answer: Chloroplast is a plastid that is involved in the synthesis of carbohydrates through photosynthesis and hence called as the kitchen of the cell.

Q.32. Lipid molecules in the cell are synthesized by:

A. Smooth endoplasmic reticulum

B. Rough endoplasmic reticulum

C. Golgi apparatus

D. Plastids

Answer: The Smooth endoplasmic reticulum is involved in the synthesis of lipids. The rough endoplasmic reticulum synthesizes proteins, Golgi apparatus synthesizes complex sugars and plastids are involved in the synthesis of carbohydrates through photosynthesis.

Q.33. Cell arises from pre-existing cell was stated by:

A. Haeckel

B. Virchow

C. Hooke

D. Schleiden

Answer: Virchow expanded Scheiden's cell theory and stated that cells arise from pre-existing cells. Hooke was the first one to discover a cell and Haekel proposed the combination of cell theory with evolution.

Q.34. Cell theory was given by:

A. Schleiden and Schwann

B. Virchow

C. Hooke

D. Haeckel

Answer: Schleidena nd Schwann gave the cell theory in 1838 and 1839 respectively. Virchow expanded their cell theory; Hooke was the first one to discover a cell and Haekel proposed the combination of cell theory with evolution.

Q.35. The only cell organelle seen in prokaryotic cell is:

A. Mitochondria

B. Ribosomes

C. Plastids

D. Lysosomes

Answer: Prokaryotic cell do not possess any real cell organelles. It uses ribosomes for the synthesis of proteins.

Q.36. Organelle without a cell membrane is:

A. Ribosome

B. Golgi apparatus

C. Chloroplast

D. Nucleus

Answer: Ribosome is a circular particle attached to the double membrane Endoplasmic reticulum. All the others are double membrane organelles.

Comprehensive Exercises (T/F)

Q.1. Write true or false for the following statements:

Plastids are present in both plant and animal cells.

Answer: False

Plastids are only found in plants.

Q.2. Write true or false for the following statements:

In unicellular organisms the vacuole contains the food which an organism has consumed.

Answer: True

Vacuole is a single membrane organelle that is used for storage of water and other nutrient molecules.

Q.3. Write true or false for the following statements:

The nucleus plays a central role in cellular reproduction.

Answer: True

The nucleus contains the genetic material, the DNA of the cell which is necessary for cellular reproduction.

Q.4. Write true or false for the following statements:

An undefined nuclear region containing only nucleic acids is called a nucleolus.

Answer: False

An undefined nuclear region containing only nucleic acids is called nucleoid.

Q.5. Write true or false for the following statements:

The chlorophyll in photosynthetic prokaryotic bacteria is associated with membranous vesicles but not with plastids.

Answer: True

The chlorophyll in bacteria is not in the form of a cell organelle. Instead, it occurs as a loose pigment that is associated with the cell membranes of vesicles.

Q.6. Write true or false for the following statements:

The endoplasmic reticulum is a large network of membrane-bound tubes and sheets.

Answer: True

Endoplasmic reticulum is a network of branching tubules. It extends from the cell membrane to the nuclear membrane.

Q.7. Write true or false for the following statements:

RER looks smooth under a microscope because it has particles called ribosomes attached to its surface.

Answer: False

RER (Rough Endoplasmic Reticulum) looks rough under a microscope because it has particles called ribosomes attached to its surface.

Q.8. Write true or false for the following statements:

Leucoplasts are the coloured plastids.

Answer: False

Chromoplasts are coloured plastids.

Q.9. Write true or false for the following statements:

Vacuoles are storage sacs for solid or liquid contents.

Answer: True

Vacuoles are single membrane organelles that are involved in the storage of water and nutrients in a cell.

Q.10. Write true or false for the following statements:

Mitochondria have three membrane coverings.

Answer: False

Mitochondria have two membrane coverings. The outer membrane is smooth while the inner membrane is folded.