1. CELL - THE FUNDAMENTAL UNIT OF LIFE

Teaching Task:

1.“Cells are basic structural units of living organisms”. It is called so because
Answer: A. all living organisms are made up of cells
Explanation: Cells are considered the basic structural units because all living organisms (except viruses) are composed of cells, which form the foundation of their structure and function. Options B, C, and D are true but do not directly explain why cells are the basic structural units.

2.Some cells of our body can be about a foot long. These are
Answer: A. Nerve cells
Explanation: Nerve cells (neurons) can extend up to a foot or more in length (e.g., sciatic nerve axons), making them the longest cells in the human body. Muscle, bone, and gland cells are not as long.

3.Energy currency of the cell is
Answer: C. ATP
Explanation: Adenosine triphosphate (ATP) is the primary molecule used to store and transfer energy in cells. ADP is a precursor, FTP is not a standard term, and not all options apply.

4.The extra protection in a plant cell which is made up of cellulose is
Answer: C. Cell wall
Explanation: The cell wall, made of cellulose, provides additional structural support and protection in plant cells. The cell membrane and plasma membrane (same structure) are present in all cells but do not provide “extra” protection specific to plants.

5.The component of the cell with hereditary material is
Answer: A. Nucleus
Explanation: The nucleus contains DNA, the hereditary material that carries genetic information. Protoplasm and cytoplasm are general cellular components, and plastids store pigments or nutrients, not hereditary material.

6.DNA & RNA are found in the
Answer: A. Nucleus
Explanation: DNA is primarily located in the nucleus, and RNA is synthesized there (though it may move to the cytoplasm). Cell walls, cell sap, and vacuoles do not contain nucleic acids.

7.The vacuoles in the cells are filled up with
Answer: B. Cell sap
Explanation: Vacuoles in plant cells are filled with cell sap, a solution of water, nutrients, and waste products. Enzymes, nucleoplasm, and proteins are not the primary contents.

8.The study related to the structure and functioning of cells is known as
Answer: C. Cytology
Explanation: Cytology is the branch of biology that studies the structure and function of cells. Palynology studies pollen, karyology focuses on the nucleus, and embryology studies embryo development.

9.All organelles have double membrane except
Answer: B. Lysosomes
Explanation: The nucleus, chloroplasts, and mitochondria have double membranes. Lysosomes have a single membrane, making them the exception.

10.Which of the following is a storage organelle
Answer: B. Leucoplast
Explanation: Leucoplasts are plastids that store nutrients like starch, oils, or proteins. Mitochondria produce energy, chloroplasts perform photosynthesis, and ribosomes synthesize proteins.

11.Which of the following shows the correct level of organisation
Answer: A. Cells '! Tissues '! Organs '! Organ system '! Organism
Explanation: The correct hierarchy of biological organization starts with cells, which group into tissues, then organs, organ systems, and finally the organism.

12.Mitochondria and chloroplasts are known as semi-autonomous organelles because
Answer: B. They have their own DNA and Ribosomes
Explanation: Mitochondria and chloroplasts contain their own DNA and ribosomes, allowing them to synthesize some proteins independently, making them semi-autonomous. Double membranes and universal presence in cells are not the reason.

13.Chromosomes are composed of
Answer: B. DNA and Proteins
Explanation: Chromosomes consist of DNA (carrying genetic information) and proteins (e.g., histones) that package the DNA. Lipids and RNA are not primary components.

14.The main function of plasma membrane is to
Answer: B. Control what goes into and out of the cell
Explanation: The plasma membrane is selectively permeable, regulating the movement of substances to maintain cellular homeostasis. It does not prevent water movement, allow only lipids, or move the cell.

15.Cell is best defined as
Answer: D. The structural and functional unit of life
Explanation: The cell is the smallest unit capable of performing all life processes, making it both the structural and functional unit of living organisms.

16.Double membrane is absent in
Answer: D. Lysosome
Explanation: Lysosomes have a single membrane, while mitochondria, chloroplasts, and the nucleus have double membranes.

17.Animal cell is limited by
Answer: A. Plasma membrane
Explanation: Animal cells lack a cell wall and are bounded by the plasma membrane, which regulates material exchange and provides structure.

18.The radiant energy of sunlight is converted to chemical energy and stored as
Answer: C. ATP
Explanation: In chloroplasts, sunlight energy is converted into chemical energy stored in ATP and NADPH during photosynthesis, with ATP being the primary energy currency.

19.Root hair absorbs water from soil through
Answer: A. Osmosis
Explanation: Root hairs absorb water via osmosis, the passive movement of water across a semi-permeable membrane from a region of higher water concentration to lower concentration.

20.The barrier between the protoplasm and outer environment in a plant cell is
Answer: C. Cell wall
Explanation: The cell wall is the outermost, rigid barrier in plant cells, separating the protoplasm from the external environment. The cell membrane is internal to the cell wall, and the tonoplast surrounds the vacuole.

21.An animal cell differs from a plant cell in respect of
Answer: B. Cell wall
Explanation: Animal cells lack a cell wall, which is present in plant cells. Both cell types have ER, ribosomes, and cell membranes.

22.If the nucleus is a cell's "control centre" and chloroplasts its "solar collectors". Which of the following might be called the cell's combination "food processor" and "garbage disposer"?
Answer: A. Lysosome
Explanation: Lysosomes digest cellular waste and debris (garbage disposer) and can break down nutrients (food processor), fitting the analogy. Ribosomes synthesize proteins, the Golgi apparatus packages materials, and the nucleolus forms ribosomes.

23.The longest cell in human body is
Answer: A. Neuron
Explanation: Neurons, particularly their axons, can extend up to a meter in length (e.g., sciatic nerve), making them the longest cells in the human body.

24.Identify human cells which lack nucleus
Answer: B. RBC
Explanation: Mature red blood cells (RBCs) lack a nucleus to maximize hemoglobin content for oxygen transport. WBCs, platelets, and nerve cells have nuclei.

25.The energy currency of a cell is
Answer: C. ATP
Explanation: ATP (adenosine triphosphate) is the universal energy currency used for cellular processes. ADP, AMP, and CTP are not primary energy carriers.

26.Which organelle releases oxygen?
Answer: D. Chloroplast
Explanation: Chloroplasts release oxygen as a byproduct of photosynthesis during the light-dependent reactions. Ribosomes, Golgi apparatus, and mitochondria do not produce oxygen.

27.The term "protoplasm" to the living substance present inside the cell, was given by
Answer: C. J.E. Purkinje
Explanation: J.E. Purkinje coined the term "protoplasm" in 1839 to describe the living substance within cells.

28.Ribosomes are the centre for
Answer: C. Protein synthesis
Explanation: Ribosomes are the cellular structures where protein synthesis occurs by translating mRNA into polypeptide chains.

29.Lysosomes are the reservoirs of
Answer: D. Hydrolytic enzymes
Explanation: Lysosomes contain hydrolytic enzymes that digest waste, cellular debris, and foreign particles. They do not store fat, RNA, or secretory glycoproteins.

30.The membrane surrounding the vacuole of a plant cell is called
Answer: A. Tonoplast
Explanation: The tonoplast is the single membrane surrounding the vacuole in plant cells, regulating the movement of substances into and out of the vacuole.

More Than One Answer

31.Choose the correct statements about unicellular organisms
Answer: B. ii, iii, iv
Explanation:
Unicellular organisms are made up of many cells: False, unicellular organisms consist of a single cell.
One cell carries out all functions of an organism: True, in unicellular organisms, a single cell performs all life functions.
Amoeba, Bacteria, Paramoecium are examples of unicellular: True, these are all single-celled organisms.
Death of one cell causes death of the organism: True, since unicellular organisms are single-celled, the death of the cell means the death of the organism.

32.Choose the correct statement about the size of cells
Answer: A. i, iii, iv
Explanation:
Egg of an ostrich is largest cell: True, the ostrich egg is the largest single cell.
Neurons are the shortest cell in our body: False, neurons can be the longest cells (up to a meter), not the shortest.

RBC are the smallest cell in our body: True, red blood cells are among the smallest cells in the human body (~7-8 μm).
Bacteria is the smallest cell in the world: True, bacteria like Mycoplasma are among the smallest cells (~0.1-0.5 μm).

33.Choose the odd one out from the sentences
Answer: A. i, ii, iii
Explanation:
Mitochondria is the single membrane organelle: False, mitochondria have a double membrane.
ER is the power house of the cell: False, mitochondria are the powerhouse, not the endoplasmic reticulum (ER).
Plastids are present in animal cell: False, plastids are exclusive to plant cells.
Nucleus is chief controlling center of the cell: True, the nucleus regulates cellular activities. Thus, i, ii, and iii are incorrect, making them the odd ones out.

Assertion & Reason

34.A: Mitochondria is the power house of the cell. R: ATP is produced in mitochondria.
Answer: A. A & R true & R explains A
Explanation: Mitochondria are called the powerhouse because they produce ATP through cellular respiration. The reason (ATP production) directly explains the assertion.

35.A: Cell wall is not found in animal cell. R: Animal cells are covered by cell membrane.
Answer: A. A & R true & R explains A
Explanation: Animal cells lack a cell wall and are bounded by a plasma membrane, which explains why they do not have a cell wall. The reason supports the assertion.

Match the Following

36.Column I: i. Unicellular, ii. Multicellular, iii. Largest cell, iv. Living substance of the cell, v. Prokaryote
Answer: B. i-e, ii-d, iii-a, iv-b, v-c
Explanation:
Unicellular '! e. Paramoecium: Paramecium is a unicellular organism.
Multicellular '! d. Plants and animals: Plants and animals are multicellular organisms.
Largest cell '! a. Egg of an ostrich: The ostrich egg is the largest single cell.

Living substance of the cell '! b. Protoplasm: Protoplasm is the living substance within cells.
Prokaryote '! c. Blue green algae: Blue-green algae (cyanobacteria) are prokaryotes.

37.Column I: 1. Mitochondria, 2. Golgi bodies, 3. Chloroplast, 4. Lysosomes
Answer: B. 1-b, 2-c, 3-d, 4-a
Explanation:
Mitochondria '! b. Powerhouse of the cell: Mitochondria produce ATP.
Golgi bodies '! c. Packaging unit: Golgi apparatus packages proteins and lipids.
Chloroplast '! d. Food Factory: Chloroplasts produce glucose via photosynthesis.
Lysosomes '! a. Suicidal bags: Lysosomes can digest cellular contents, leading to cell death.

Comprehension

38.Prokaryotes have ____ for movement
Answer: A. Flagellum
Explanation: Many prokaryotes, like bacteria, use flagella for movement. Ribosomes are for protein synthesis, capsules provide protection, and cell walls provide structure.

39.Prokaryotes have
Answer: C. No membrane
Explanation: Prokaryotic cells lack a nuclear membrane and membrane-bound organelles, so their genetic material is not enclosed by a membrane.

40.Well-defined nucleus and cell organelles are present in
Answer: B. Eukaryotes
Explanation: Eukaryotic cells have a well-defined nucleus with a nuclear membrane and membrane-bound organelles, unlike prokaryotes.

41.Example of prokaryotes
Answer: C. Bacteria & Blue green algae
Explanation: Bacteria and blue-green algae (cyanobacteria) are prokaryotes, lacking a defined nucleus. Plants, animals, and fungi are eukaryotes.

Learner's Task:

Multiple Choice Questions (Single Correct Answer)

1."The Kitchen of the cell" is called
Answer: D. Chloroplasts
Explanation: Chloroplasts are referred to as the "kitchen of the cell" because they are the site of photosynthesis in plant cells, where light energy is converted into chemical energy stored in glucose, analogous to a kitchen producing food.

2.The functional unit of life is called
Answer: A. Cell
Explanation: The cell is the basic structural and functional unit of life, as it performs all essential life processes and forms the basis of all living organisms.

3.Which of the following cells does not have a nucleus
Answer: D. Matured man RBC
Explanation: Mature human red blood cells (RBCs) lack a nucleus to maximize space for hemoglobin, which carries oxygen. Brain cells, cardiac muscle cells, and Paramecium all have nuclei.

4.Who observed and coined the word cell for the first time
Answer: A. Robert Hooke
Explanation: Robert Hooke observed cork under a microscope in 1665 and coined the term "cell" to describe the box-like structures, which resembled cells in a monastery.

5.Which cell organelle is known as the powerhouse of the cell
Answer: D. Mitochondria
Explanation: Mitochondria are called the powerhouse of the cell because they produce ATP, the energy currency of the cell, through cellular respiration.

6.The plasma membrane is
Answer: B. Semi permeable
Explanation: The plasma membrane is semi-permeable (or selectively permeable), allowing selective passage of certain molecules (e.g., small, non-polar molecules) while restricting others, maintaining cellular homeostasis. "Differentially permeable" (C) is a synonym but less commonly used in this context.

7.The infoldings of the inner membrane of mitochondria is referred to as
Answer: D. Cristae
Explanation: Cristae are the infoldings of the inner mitochondrial membrane, increasing surface area for ATP production during cellular respiration. Grana and stroma are chloroplast structures, and oxysomes are part of cristae but not the primary term.

8.The outermost boundary of an animal cell is
Answer: A. Plasma membrane
Explanation: In animal cells, the plasma membrane is the outermost boundary, providing structure and regulating material exchange. Animal cells lack a cell wall. The nucleus and cytoplasm are internal, and the cytoskeleton provides structural support but is not a boundary.

9.The cells' 'Garbage disposals' are
Answer: A. Lysosomes
Explanation: Lysosomes contain hydrolytic enzymes that break down waste materials and cellular debris, earning them the nickname "garbage disposals" of the cell. Peroxisomes handle specific metabolic reactions, mitochondria produce energy, and vacuoles store substances.

10.The jelly-like interior of the cell is called
Answer: B. Cytoplasm
Explanation: Cytoplasm is the jelly-like substance within the cell membrane, containing organelles, enzymes, and other cellular components, excluding the nucleus. Vacuoles store substances, the cytoskeleton provides structure, and the nucleus contains genetic material.

11.Which is the largest cell
Answer: C. Ostrich
Explanation: The ostrich egg is the largest single cell, as it is a single cell before fertilization. Neurons are long but not the largest in volume, RBCs are small, and PPLO (Mycoplasma) is among the smallest cells.

12.Cytoplasm contains _____ % of water
Answer: C. 80
Explanation: Cytoplasm is approximately 80% water, providing a medium for cellular processes and maintaining cell structure. This is a widely accepted average, though it can vary slightly.

13.Centriole is associated with
Answer: C. Spindle formation
Explanation: Centrioles play a key role in cell division by organizing the spindle fibers that separate chromosomes during mitosis. They are not directly involved in DNA synthesis, reproduction (as a whole process), or respiration.

14.The cell organelle associated with cell secretion is
Answer: C. Golgi apparatus
Explanation: The Golgi apparatus modifies, packages, and secretes proteins and lipids for use inside or outside the cell. Plastids are plant-specific, mitochondria produce energy, and the nucleolus synthesizes ribosomal RNA.

15.Which of the following is an inclusion?
Answer: D. Starch grain
Explanation: Inclusions are non-living substances stored in cells, such as starch grains in plant cells. Mitochondria, lysosomes, and the Golgi complex are organelles, not inclusions.

16.Which of the following would not be considered part of a cell's cytoplasm?
Answer: B. Nucleus
Explanation: Cytoplasm includes all cellular contents outside the nucleus but within the plasma membrane. The nucleus is a distinct organelle, not part of the cytoplasm, while ribosomes, mitochondria, and microtubules are cytoplasmic components.

17.Which of the following is called the brain of the cell?
Answer: A. Nucleus
Explanation: The nucleus is called the brain of the cell because it controls cellular activities by regulating gene expression and storing genetic information. Mitochondria produce energy, ribosomes synthesize proteins, and the plasma membrane regulates transport.

18.Which one is not a part of nucleus?
Answer: C. Centrosome
Explanation: The nucleus contains chromatin, nucleolus, and nucleoplasm. The centrosome, containing centrioles, is located in the cytoplasm, not the nucleus.

19.The common feature amongst nucleus, chloroplast, and mitochondrion is
Answer: A. DNA
Explanation: Nucleus, chloroplasts, and mitochondria all contain their own DNA, enabling them to perform specific functions (e.g., gene expression, photosynthesis, respiration). Lamellae and cristae are specific to chloroplasts and mitochondria,

respectively, not the nucleus.

20.Nucleus is separated from surrounding cytoplasm by a nuclear envelope which is
Answer: B. Double and porous
Explanation: The nuclear envelope is a double membrane with nuclear pores that allow selective exchange of materials (e.g., RNA, proteins) between the nucleus and cytoplasm.

21.Nucleoplasm is continuous with cytoplasm through
Answer: C. Nuclear pores
Explanation: Nuclear pores in the nuclear envelope allow the exchange of materials (e.g., RNA, proteins) between the nucleoplasm and cytoplasm. Centrioles, Golgi apparatus, and endoplasmic reticulum are not directly involved in this connection.

22.Nucleolus was discovered by
Answer: A. Fontana
Explanation: Felice Fontana is credited with discovering the nucleolus in the 18th century, observing it as a dense body within the nucleus. Schleiden, Altmann, and Robert Brown made other contributions to cell biology.

23.The function of the nucleolus in the cell is
Answer: C. Synthesis of RNA and ribosomes
Explanation: The nucleolus is responsible for synthesizing ribosomal RNA (rRNA) and assembling ribosomes, essential for protein synthesis. It is not primarily secretory or involved in DNA synthesis.

24.Which of the following phenomena is commonly referred as 'cell drinking'?
Answer: B. Pinocytosis
Explanation: Pinocytosis, or "cell drinking," involves the uptake of extracellular fluid and dissolved solutes into the cell via small vesicles. Exocytosis releases materials, endocytosis is a broader term, and phagocytosis involves solid particles.

25.The cell organelle taking part in photorespiration is
Answer: C. Peroxisome
Explanation: Peroxisomes are involved in photorespiration in plant cells, working with chloroplasts and mitochondria to metabolize byproducts of photosynthesis. Glyoxysomes are involved in lipid metabolism, dictyosomes are Golgi bodies, and the ER is not involved in photorespiration.

26.Endoplasmic reticulum sometimes contains
Answer: A. Ribosomes
Explanation: Rough endoplasmic reticulum (RER) is studded with ribosomes, which synthesize proteins that are processed within the ER. Lysosomes and Golgi bodies are separate organelles.

27.Ribosomes are composed of
Answer: C. 2 subunits
Explanation: Ribosomes consist of two subunits (large and small), made of rRNA and proteins, which come together during protein synthesis.

Short Answer Questions
1.Why are mitochondria called the powerhouse of the cell?
Mitochondria are called the powerhouse of the cell because they produce ATP (adenosine triphosphate) through cellular respiration, providing energy for cellular processes.

2.What name is given to the Golgi apparatus occurring in plant cells? Why is it named differently in plant cells?
In plant cells, the Golgi apparatus is often called **dictyosomes**. It is named differently because plant cells typically have multiple, smaller Golgi bodies scattered in the cytoplasm, unlike the single, stacked structure in animal cells.

3.Why are lysosomes called scavengers?
Lysosomes are called scavengers because they contain hydrolytic enzymes that break down and digest waste materials, damaged organelles, and foreign particles, cleaning up the cell.

4.What are suicide bags? Why are they called so?
Lysosomes are called suicide bags because they can release their hydrolytic enzymes to digest the cell's own contents under certain conditions, leading to programmed cell death (autolysis).

5.What for ATP stands?
ATP stands for **Adenosine Triphosphate**, the primary energy currency of the cell.

6.What would happen if plasma membrane ruptures or breaks down?
If the plasma membrane ruptures, the cell loses its integrity, allowing uncontrolled entry and exit of substances. This disrupts homeostasis, leading to cell death due to loss of essential components or influx of harmful substances.

7.Who discovered cells and how?
Robert Hooke discovered cells in 1665 by observing thin slices of cork under a microscope. He noticed box-like structures and coined the term “cell” due to their resemblance to monastery cells.

8.Why is the plasma membrane called a selectively permeable membrane?
The plasma membrane is selectively permeable because it allows only certain molecules (e.g., small, non-polar molecules) to pass through while restricting others, maintaining cellular balance.

9.Where are proteins synthesized inside the cell?
Proteins are synthesized by ribosomes, either free in the cytoplasm or attached to the rough endoplasmic reticulum (RER).

10.How does a cell act as basic structural and functional unit of an organism?
The cell is the smallest unit capable of performing all life processes (e.g., metabolism, reproduction). Structurally, cells form tissues, organs, and systems. Functionally, they carry out specialized tasks (e.g., nerve cells transmit signals, muscle cells contract), contributing to the organism’s survival.

11.How is rough ER different from smooth ER? What functions do they perform in a cell?
Rough ER: Studded with ribosomes, it synthesizes and processes proteins for secretion or use in membranes.
Smooth ER: Lacks ribosomes, it synthesizes lipids, detoxifies drugs, and regulates calcium ions.
Both are part of the endomembrane system but have distinct roles based on their structure.

12.What are different types of plastids? What are their functions?
Chloroplasts: Contain chlorophyll, perform photosynthesis to produce glucose.
Chromoplasts: Contain pigments, impart color to flowers and fruits, aiding in pollination and seed dispersal.
Leucoplasts: Store nutrients like starch, oils, or proteins in roots and seeds.
Describe the functions of Golgi complex.
The Golgi complex modifies, sorts, and packages proteins and lipids from the ER into vesicles for secretion or use within the cell. It also forms lysosomes and synthesizes certain carbohydrates.

13.Describe the functions of Golgi complex.
“The Golgi complex modifies, sorts, and packages proteins and lipids from the ER into vesicles for secretion or use within the cell. It also forms lysosomes and synthesizes certain carbohydrates.

14.What would happen to the life of a cell if there was no Golgi apparatus?
Without the Golgi apparatus, the cell would be unable to properly process, package, or secrete proteins and lipids. Lysosome formation would cease, and transport of molecules would be disrupted, impairing cell function and survival.

15.Explain the structure of nucleus. What is its function?
Structure: The nucleus is a spherical organelle with a double nuclear envelope containing pores, enclosing nucleoplasm, chromatin (DNA and proteins), and a nucleolus (rRNA synthesis site).
Function: It controls cellular activities by regulating gene expression, stores genetic information, and facilitates DNA replication and RNA synthesis.

16.What is the main function of each of the following organelles:
Cell wall: Provides structural support and protection in plant cells.
Plasma membrane: Regulates entry and exit of substances, maintaining homeostasis.
Chromosomes: Carry genetic information for inheritance and cell function.
Mitochondria: Produce ATP through cellular respiration.
Chloroplasts: Conduct photosynthesis to produce glucose.
Golgi apparatus: Modifies, packages, and secretes proteins and lipids.
Lysosomes: Digest waste materials and cellular debris.
Centrioles: Organize spindle fibers during cell division.
Vacuoles: Store nutrients, waste, or maintain turgor pressure (especially in plant cells).

17.Distinguish between cell wall and cell membrane.
Cell wall: Rigid, non-living, made of cellulose (in plants), provides structural support, found only in plant cells.
Cell membrane: Flexible, living, made of lipid bilayer with proteins, regulates material exchange, found in all cells.

18.Comment on the following:
(i) Chloroplast is called "Kitchen of the cell": Chloroplasts are called so because they produce glucose via photosynthesis, providing energy and nutrients, similar to a kitchen producing food.
(ii) Chloroplast is semi-autonomous structure: Chloroplasts are semi-autonomous because they contain their own DNA and ribosomes, allowing them to synthesize some proteins independently, though they rely on the nucleus for other functions.
(iii) Lysosomes are Garbage disposer: Lysosomes are called garbage disposers because they break down waste materials, damaged organelles, and foreign particles using hydrolytic enzymes, maintaining cellular cleanliness.

Advanced Level Questions

More Than One Answer

1.Choose the correct statement regarding cell membrane.
Answer: C. i, ii, iv
Explanation:
i. Cell membrane is also called as plasma membrane: True, the terms are synonymous.
ii. It selectively controls the entry and exit of salts and water: True, the plasma membrane is selectively permeable.
iii. It does not protect the inner content of the cell: False, it protects the cell by regulating what enters and exits.
iv. It is made with lipids and proteins: True, it consists of a lipid bilayer with embedded proteins.

2.Choose the incorrect statements about cell organelles.
Answer: A. Only iii
Explanation:
i. Plastids are divided into three types: True (chloroplasts, chromoplasts, leucoplasts).
ii. Vacuole is non-living fluid-filled sac-like structure: True, vacuoles store cell sap and are considered non-living.
iii. Cell wall is present in animal cell: False, animal cells lack a cell wall.
iv. Ribosomes synthesize the proteins: True, ribosomes are the site of protein synthesis.

3.Choose the correct sentences from the following
Answer: B. iii, iv
Explanation:
i. Amoeba, single-celled organism unable to perform all its functions: False, Amoeba can perform all life functions as a unicellular organism.
ii. A bigger organism has a big size cell: False, cell size is relatively constant; larger organisms have more cells.
iii. Cell wall is non-living structure: True, it is made of cellulose and lacks living components.
iv. Leucoplast stores starch: True, leucoplasts store starch and other nutrients.

Assertion & Reason

4.A: Mitochondria and chloroplast are semi-autonomous cell organelles. R: Mitochondria and chloroplast have their own DNA and protein synthesizing machinery.
Answer: A. A & R true & R explains A
Explanation: Both organelles have their own DNA and ribosomes, allowing them to synthesize some proteins independently, making them semi-autonomous. The reason explains the assertion.

5.A: Plastids contain green pigments called chlorophyll. R: Chlorophyll-containing plastids are called chromoplasts.
Answer: C. A is true, R is false
Explanation: Plastids like chloroplasts contain chlorophyll, making the assertion true. However, chlorophyll-containing plastids are called chloroplasts, not chromoplasts (which contain other pigments), so the reason is false.

Match the Following

6.Column I: Cytoplasm, Mitochondria, RER, Golgi apparatus
Answer: B. 1-d, 2-a, 3-b, 4-c
Explanation:
Cytoplasm (d): Center for metabolic activities, as it houses organelles and facilitates reactions.
Mitochondria (a): Produces ATP, the energy currency.
RER (b): Synthesizes proteins due to attached ribosomes.
Golgi apparatus (c): Synthesizes and secretes enzymes and hormones.

7.Column I: Chromoplast, Leucoplast, Chloroplast, Plastids
Answer: A. 1-d, 2-a, 3-b, 4-c
Explanation:
Chromoplast (d): Imparts colors to flowers and fruits.
Leucoplast (a): Stores starch and other nutrients.
Chloroplast (b): Performs photosynthesis.
Plastids (c): Have a double membrane structure.

Comprehension

8.The fluid present inside the nucleus
Answer: A. Nucleoplasm
Explanation: Nucleoplasm is the fluid within the nuclear envelope, containing chromatin and the nucleolus. Cytoplasm is outside the nucleus, and protoplasm is a general term for all living cell contents.

9.Chromatin look like
Answer: B. Thread like
Explanation: Chromatin appears as thread-like structures in the nucleus, consisting of DNA and proteins, as described in the passage.

10.Full form of DNA
Answer: C. Deoxy Ribo Nucleic Acid
Explanation: DNA stands for Deoxyribonucleic Acid, the molecule carrying genetic information. The passage mentions “Deoxyribose nucleic acid,” which is synonymous.

11.Nucleus is called
Answer: D. Both A & C
Explanation: The nucleus is called the “brain of the cell” (controls activities) and the “boss of the cell” (directs cellular functions), as it is the chief controlling center, making both terms appropriate.