I. In the following questions, a statement of Assertion is followed by a statement of Reason.

Mark the correct choice as:

(A) If both Assertion and Reason are true and Reason is the correct explanation of Assertion

(B) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

(C) If Assertion is true but Reason is false

(D) If Assertion is false and Reason are true

1. Assertion: All organisms are made up of cells.

   Reason: Cells are structural unit of living organisms. A cell keeps its chemical composition steady within its boundary.

2. Assertion: Specialization of cells is useful to organism.

   Reason: Specialization increases the operational efficiency of an organism.

3. Assertion: Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann.

   Reason: Cell theory states that all cells arise from pre-existing cells.

4. Assertion: Ribosomes are non-membrane bound organelles found in the prokaryotic cells only.

   Reason: Ribosomes are present only in the cytoplasm.

5. Assertion: Cell membrane is semipermeable.

   Reason: The constituent molecules can freely move in and out of the cell membrane.

6. Assertion: Mitochondria is the powerhouse of a cell.

   Reason: ATP is produced in mitochondria.

7. Assertion: Meiosis is known as reductional division.

   Reason: During meiosis, the chromosome number gets reduced by half of its number due to segregation.

8. Assertion: Nucleus is considered as the brain of a cell.

   Reason: Ernest Rutherford discovered the nucleus of a cell.

9. Assertion: Cell wall is a non-living part of the cell.

   Reason: It offers protection, definite shape and support

10. Assertion: Plant cells have very large vacuoles.

    Reason: In plant cells, vacuoles are full of cell sap

11. Assertion: Glycerin is used to prepare a temporary mount of slide to observe under the microscope.

    Reason: Glycerin is isotonic with the plant cells in nature

12. Assertion: Lysosomes are called the suicidal bags.

    Reason: Lysosomes keep the cell clean by digesting any foreign material.

II. Choose the correct answer from the given options for every statement.

1. Given below are four operations for preparing a temporary mount of human cheek cells:

   (i) Taking a scraping from the inner side of the cheek and spreading it on a clean slide

   (ii) Putting a drop of glycerin on the material

   (iii) Adding two or three drops of methylene blue

   (iv) Rinsing the mouth with fresh water and disinfectant solution

   Identify the correct sequence of these operations.

   (A) (i) - (ii) - (iii) - (iv) (B) (iv) - (i) - (iii) - (ii) (C) (iv) - (i) - (iii) - (ii) (D) (i) - (iii) - (ii) - (iv)

2. An unripe green fruit changes colour when it ripens. The reason being:
   (A) Chromoplasts changes to chlorophyll (B) Chromoplasts changes to chromosomes
   (C) Chromosomes changes to chromoplasts (D) Chloroplast changes to chromoplasts
3. Living cells were discovered by
   (A) Robert Hooke (C) Leeuwenhoek (B) Purkinje (D) Robert Brown
4. In the cell, complex sugars are made from simple sugars by
   (A) nucleolus (B) mitochondria (C) golgi apparatus (D) endoplasmic reticulum
5. Chromosomes are made up of
   (A) DNA (B) Protein (C) DNA and protein (D) RNA
6. 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)
7. Organelle other than nucleus, containing DNA is
   (A) endoplasmic reticulum (B) mitochondria
   (C) golgi apparatus (D) lysosomes
8. Which of the following functions is not related to endoplasmic reticulum?
   (A) It behaves as a transport channel for proteins between nucleus and cytoplasm
   (B) It transports material between various regions in cytoplasm
   (C) It can be the site of energy generation
   (D) It can be the site for some biochemical activities of the cell
9. Chromosomes are made up of
   (A) DNA (B) Protein (C) DNA and Protein (D) RNA
10. Human cheek cells are commonly stained with
    (A) safranin (B) methylene blue (C) acetocarmine (D) eosine
11. In which of the following is the cell wall not made up of cellulose?
    (A) bacteria (B) hydrilla (C) mango tree (D) cactus
12. How endoplasmic reticulum helps transport protein between various regions of the cytoplasm?
    (A) by forming a network of membrane-bound tubes in the cytoplasm
    (B) by occupying most of the space in the cytoplasm
    (C) by generating small transport vesicles throughout the cell
    (D) by directing all cell organelles to perform the same biochemical activity
13. Anil has bacterial infection. Which part of the cell will help him eliminate bacteria from his body and how?
    (A) Vacuoles as they can uptake any material and store it.
    (B) Vacuoles as they can expel substance out of the cell.
    (C) Lysosomes as they have digestive enzymes to breakdown foreign material.
    (D) Lysosomes as they can destroy their own cell.

14. The main arena of cellular activities is

(A) Nucleoplasm (B) golgi apparatus

(C) cytoplasm (D) endoplasmic reticulum

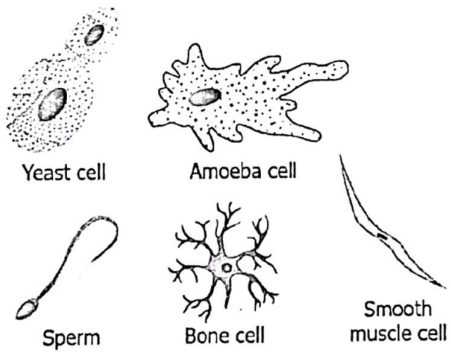
15. A student prepared a temporary mount of a plant cells. Which of the following stains can be used for slide preparation?

(A) Iodine (B) Safranin (C) methylene blue (D) both (A) and (C).

16. Which among the following is present in prokaryotic cells?

(A) Mitochondria (B) plastids (C) nucleus (D) ribosomes

17. The image shows some types of cells. Based on the image what could be the reason for the different shape and size?



(A) to suit their function (B) as they are formed first or last in the body

(C) as they are all animal cells (D) as some are plant cells and some animal cells

18. Colored plastids found in plant cell are called

(A) Leucoplasts (B) chromoplasts (C) chloroplasts (D) all of the above

19. Colourless plastids are known as

(A) Chromoplasts (B) Chloroplasts (C) Leucoplasts (D) Protoplast

20. The barrier between the protoplasm and the outer environment in an animal cell is

(A) Cell wall (B) Plasma membrane

(C) Nuclear membrane (D) Cytoplasm

CASE STUDY BASED QUESTIONS

I. The current pandemic of coronavirus disease 2019 (COVID-19) has spurred intense interest into the mechanisms of cell damage and tissue death following infection by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Varying ways have been described in which the virus co-opts the machinery of the host cell following infection to evade or modulate the host immune response, alter the pattern of translation of viral proteins, and the release of new viral particles. One way is glycosylation while passing out of endoplasmic reticulum.

If glycoprotein folding is disrupted by inhibiting glycosylation, or simply if the level of glycosylation is directly altered, SARS-CoV-2 infection could be targeted.

1. Endoplasmic reticulum membrane which is associated with ribosomes is called

(A) ER lumen (B) Smooth endoplasmic reticulum

(C) Rough endoplasmic reticulum (D) Endosome

2. SER is involved in

(A) lipid and protein synthesis (B) lipid synthesis

(C) Protein synthesis (D) All of the above

3. he organanelle is involved in detoxification

(A) SER (B) RER (C) Lysosomes (D) Golgi Apparatus

4. Which of the following organelle contuse from the nuclear membrane?

(A) Golgi apparatus (B) SER (C) RER (D) Mitochondria

II. The process, important in biology, was first thoroughly studied in 1877 by a German plant physiologist, Wilhelm Pfeffer. Earlier workers had made less accurate studies of leaky membranes (e.g., animal bladders) and the passage through them in opposite directions of water and escaping substances. The general term osmose (now osmosis) was introduced in 1854 by a British chemist, Thomas Graham.

If a solution is separated from the pure solvent by a membrane that is permeable to the solvent but not the solute, the solution will tend to become more dilute by absorbing solvent through the membrane. This process can be stopped by increasing the pressure on the solution by a specific amount, called the osmotic pressure. The Dutch-born chemist Jacobus Henricus van 't Hoff showed in 1886 that if the solute is so dilute that its partial vapour pressure above the solution obeys Henry's law (i.e., is proportional to its concentration in the solution), then osmotic pressure varies with concentration and temperature approximately as it would if the solute were a gas occupying the same volume

1. Following are a few definitions of osmosis Read carefully and select the correct definition

(A) Movement of water molecules from a region of higher concentration to a region of lower concentration through a semipermeable membrane

(B) Movement of solvent molecules from its higher concentration to lower concentration

(C) Movement of solvent molecules from higher concentration to lower concentration of solution through a permeable membrane

(D) Movement of solute molecules from lower concentration to a higher concentration of solution through a semipermeable membrane

2. Plasmolysis is a plant cell is defined as

(A) break down (lysis) of the plasma membrane in hypotonic medium

(B) shrinkage of cytoplasm in hypertonic medium

(C) shrinkage of nucleoplasm

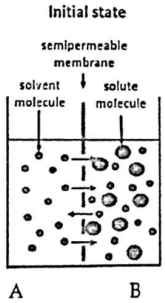
(D) none of them

3. Amoeba acquires its food through a process, termed

(A) exocytosis (B) endocytosis

(C) plasmolysis (D) exocytosis and endocytosis both

3. In the diagram for an experimental setup shown below, predict the movement of water molecules



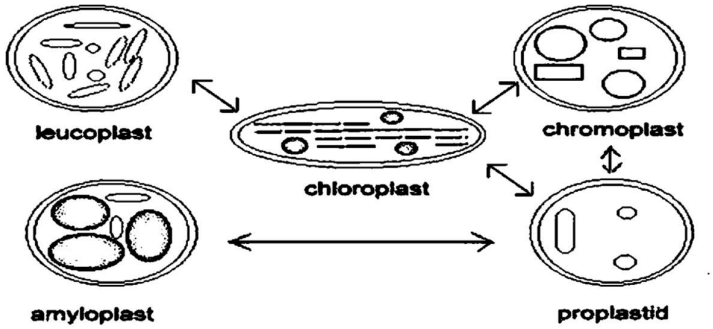
(A) From A to B

(B) From B to A

(C) Free flow of water molecules will happen

(D) No movement of water molecules will take place

III. Leucoplasts are colourless plastids. They store starch, oil, proteins. Chromoplasts are coloured plastids. They contain pigments. e.g. Chloroplasts contain green pigment present in the plant cell. Chromoplasts provide colour to various flowers and fruits.



1. What is the function of leucoplasts?
   (A) They store starch, oil, proteins.
   (B) They provide colour various flowers and fruits.
   (C) They help in photosynthesis.
   (D) They give support to the plants.
2. Which plastids provide colour to fruits and flowers?
   (A) Leucoplasts (B) Chromoplasts (C) Chloroplasts (D) Proteinoplast
3. Which of the following statement is true?
   (A) Plastids are present in both plant and animal cell.
   (B) Plastids are absent in plant as well as animal cell.
   (C) Plastids are present only in plant cell.
   (D) Plastids are present only in animal cell.
4. Which plastids contain green pigment?
   (A) Leucoplasts contain green pigment.
   (B) Chloroplasts contain green pigment.
   (C) Chromoplasts mainly contain green pigment.
   (D) None of the plastids contain green pigment.