Class 11 Biology

Cell : The Unit Of Life

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Exercise 8.1

Which of the following is not correct?

(a) Robert Brown discovered the cell.

(b) Schleiden and Schwann formulated the cell theory.

(c) Virchow explained that cells are formed from pre-existing cells.

(d) A unicellular organism carries out its life activities within a single cell.

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Exercise 8.2

New cells generate from

(a) bacterial fermentation (b) regeneration of old cells

(c) pre-existing cells (d) abiotic materials

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Exercise 8.3

Match the following

(a) Cristae	(i) Flate membranous sacs in stroma
(b) Cisternae	(ii) Ifoldings in mitochondria
(c) Thylakoids	(iii) Disc-shaped sacs in Golgi apparatus

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Exercise 8.4

Which of the following is correct:

(a) Cells of all living organisms have a nucleus.

(b) Both animal and plant cells have a well defined cell wall.

(c) In prokaryotes, there are no membrane bound organelles.

(d) Cells are formed de novo from abiotic materials.

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Exercise 8.5

What is a mesosome in a prokaryotic cell? Mention the functions that it performs.

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Exercise 8.6

How do neutral solutes move across the plasma membrane? Can the polar molecules also move across it in the same way? If not, then how are these transported across the membrane?

SOLUTION:

Plasma membrane is the outermost covering of the cell

that separates it from the environment. It regulates the movement of substances into the cell and out from it. It allows the entry of only some substances and prevents the movement of other materials. Hence, the membrane is selectively-permeable.

Movement of neutral solutes across the cell membrane

Neutral molecules move across the plasma membrane by simple passive diffusion. Diffusion is the movement of molecules from a region of higher concentration to a region of lower concentration.

Movement of polar molecules across the cell membrane

The cell membrane is made up of a phospholipid bilayer and proteins. The movement of polar molecules across the non-polar lipid bilayer requires carrier-proteins. Carrier-proteins are integral protein particles having certain affinity for specific solutes. As a result, they facilitate the transport of molecules across the

membrane.

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Exercise 8.7

Name two cell-organelles that are double membrane bound. What are the characteristics of these two organelles? State their functions and draw labelled diagrams of both.

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Exercise 8.8

What are the characteristics of prokaryotic cells?

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Exercise 8.9

Multicellular organisms have division of labour. Explain.

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Exercise 8.10

Cell is the basic unit of life. Discuss in brief.

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Exercise 8.11

What are nuclear pores? State their function.

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Exercise 8.12

Both lysosomes and vacuoles are endomembrane structures, yet they differ in terms of their functions. Comment.

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Exercise 8.13

Describe the structure of the following with the help of labelled diagrams. (i) Nucleus (ii) Centrosome

SOLUTION:

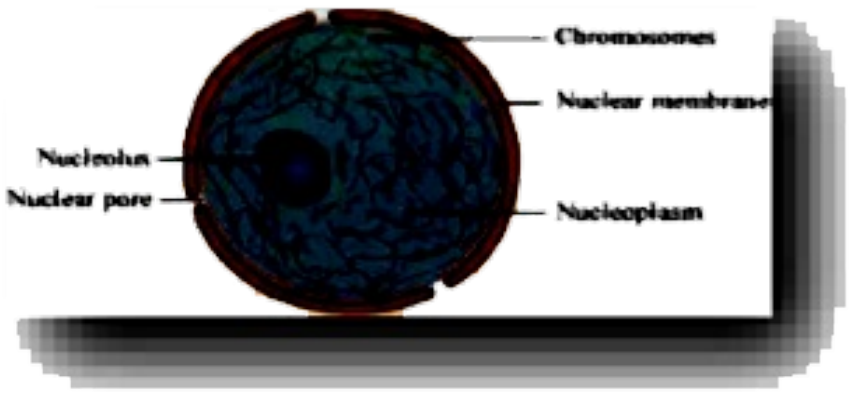
(i) Nucleus

Nucleus controls all the cellular activities of the cell. It is spherical in shape. It is composed of the following structures:

Nuclear membrane: It is a double membrane separating the contents of the nucleus from the cytoplasm. The narrow space between the two membranes is called the perinuclear space. Nuclear membrane has tiny holes called nuclear pores. These holes allow specific

substances to be transferred into a cell and out from it.

Nucleoplasm/Nuclear matrix: It is a homogenous granular fluid present inside the nucleus. It contains the nucleolus and chromatin. Nucleolus is a spherical structure that is not bound by any membrane. It is rich in protein and RNA molecules, and is the site for ribosome formation. Chromatin is an entangled mass of thread-like structures. It contains DNA and some basic proteins called histones.

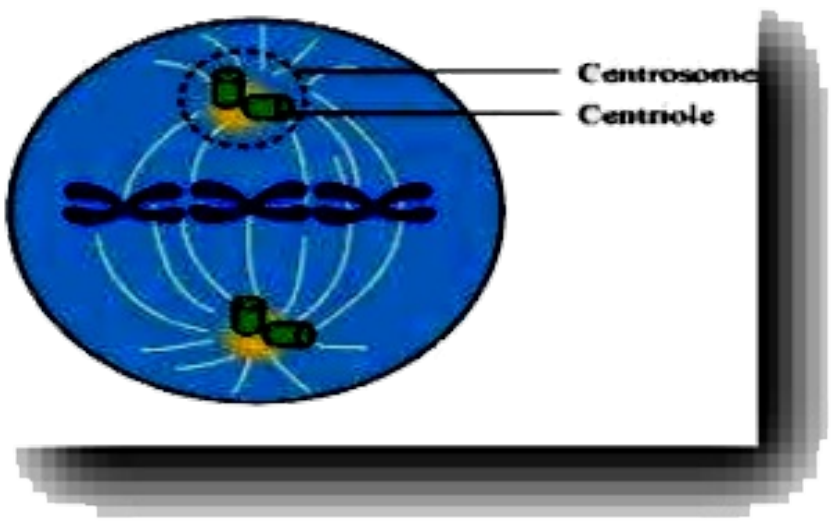


(ii)

Centrosome

Centrosome consists of two cylindrical structures called centrioles. Centrioles lie perpendicular to each other. Each has a cartwheel-like organisation. A centriole is made up of microtubule triplets that are evenly spaced in

a ring. The adjacent triplets are linked together. There is a proteinaceous hub in the central part of a centriole. The hub is connected to the triplets via radial spokes. These centrioles help in organising the spindle fibres and astral rays during cell division. They form the basal body of cilia and flagella.



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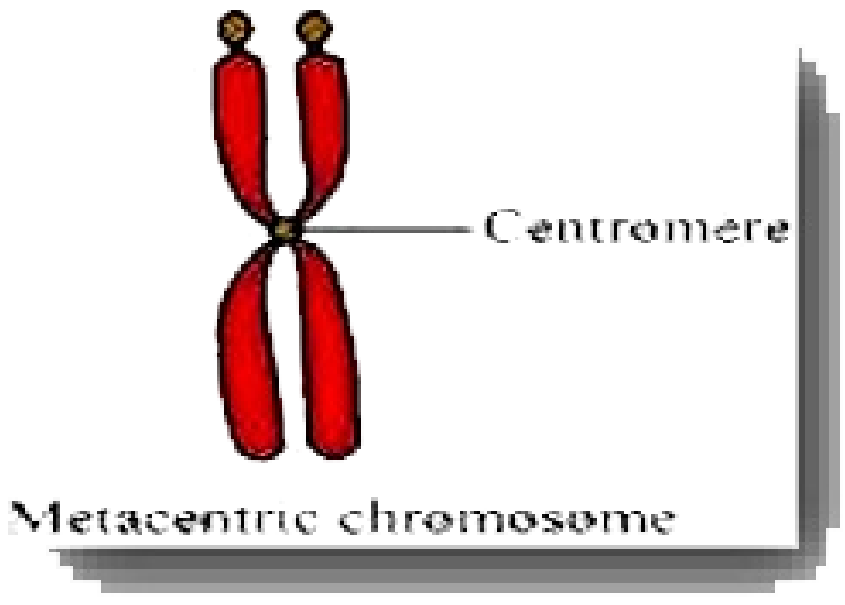
Exercise 8.14

What is a centromere? How does the position of centromere form the basis of classification of chromosomes. Support your answer with a diagram showing the position of centromere on different types of chromosomes.

SOLUTION:

Centromere is a constriction present on the chromosomes where the chromatids are held together. Chromosomes are divided into four types based on the position of the centromere.

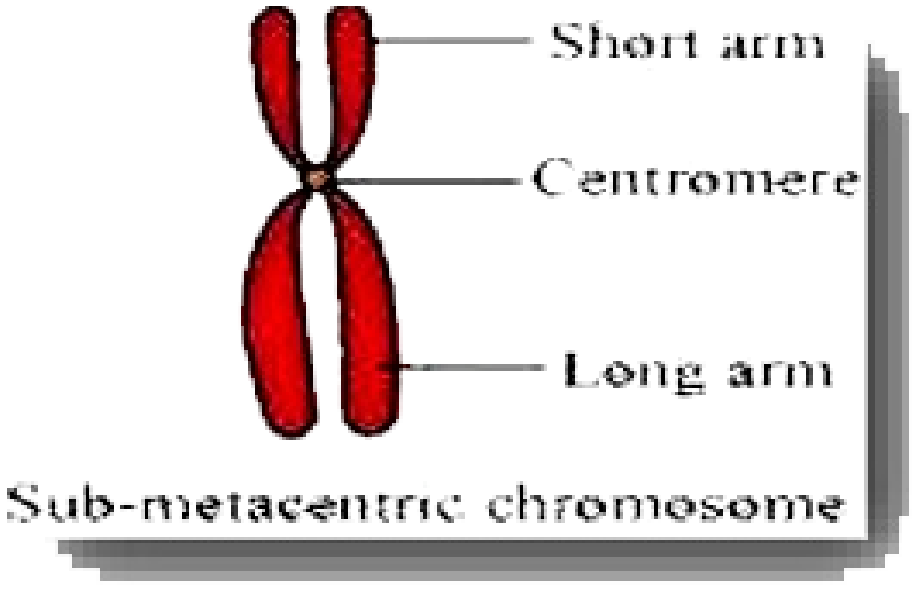
(i) Metacentric chromosome The chromosomes in which the centromere is present in the middle and divides the chromosome into two equal arms is known as a metacentric chromosome.



(ii) Sub-metacentric chromosome

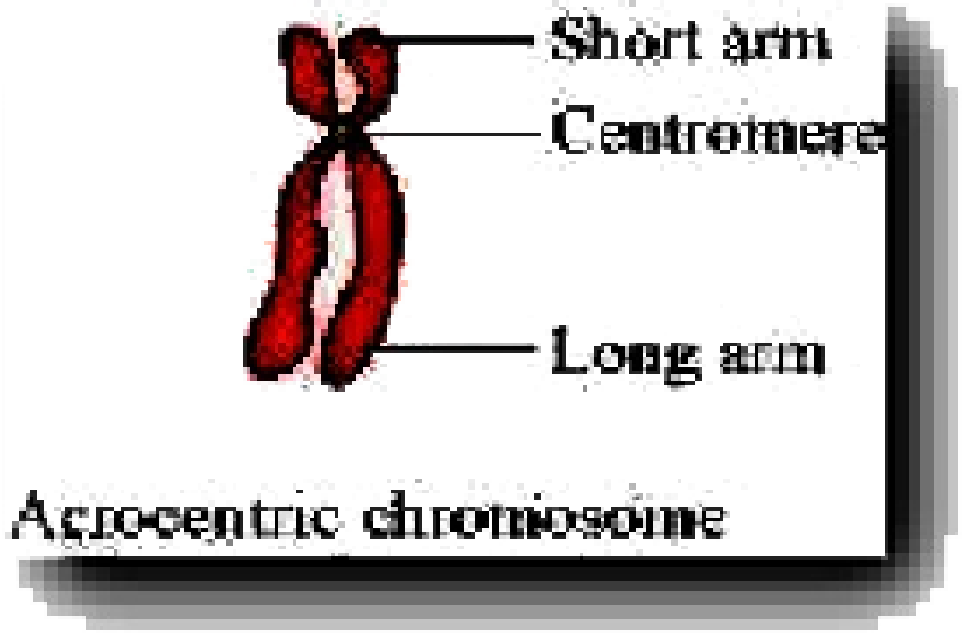
The chromosome in which the centromere is slightly away from the middle region is known as a sub-

metacentric chromosome. In this, one arm is slightly longer than the other.



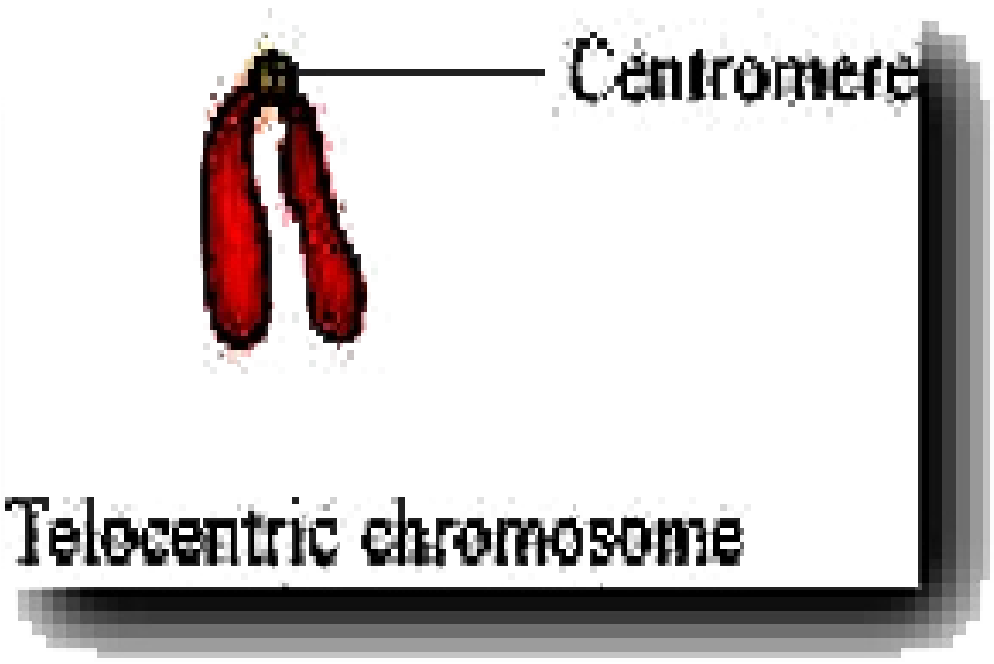
(iii) Acrocentric chromosome

The chromosome in which the centromere is located close to one of the terminal ends is known as an acrocentric chromosome. In this, one arm is extremely long and the other is extremely short.



(iv) Telocentric chromosome

The chromosome in which the centromere is located at one of the terminal ends is known as a telocentric chromosome.



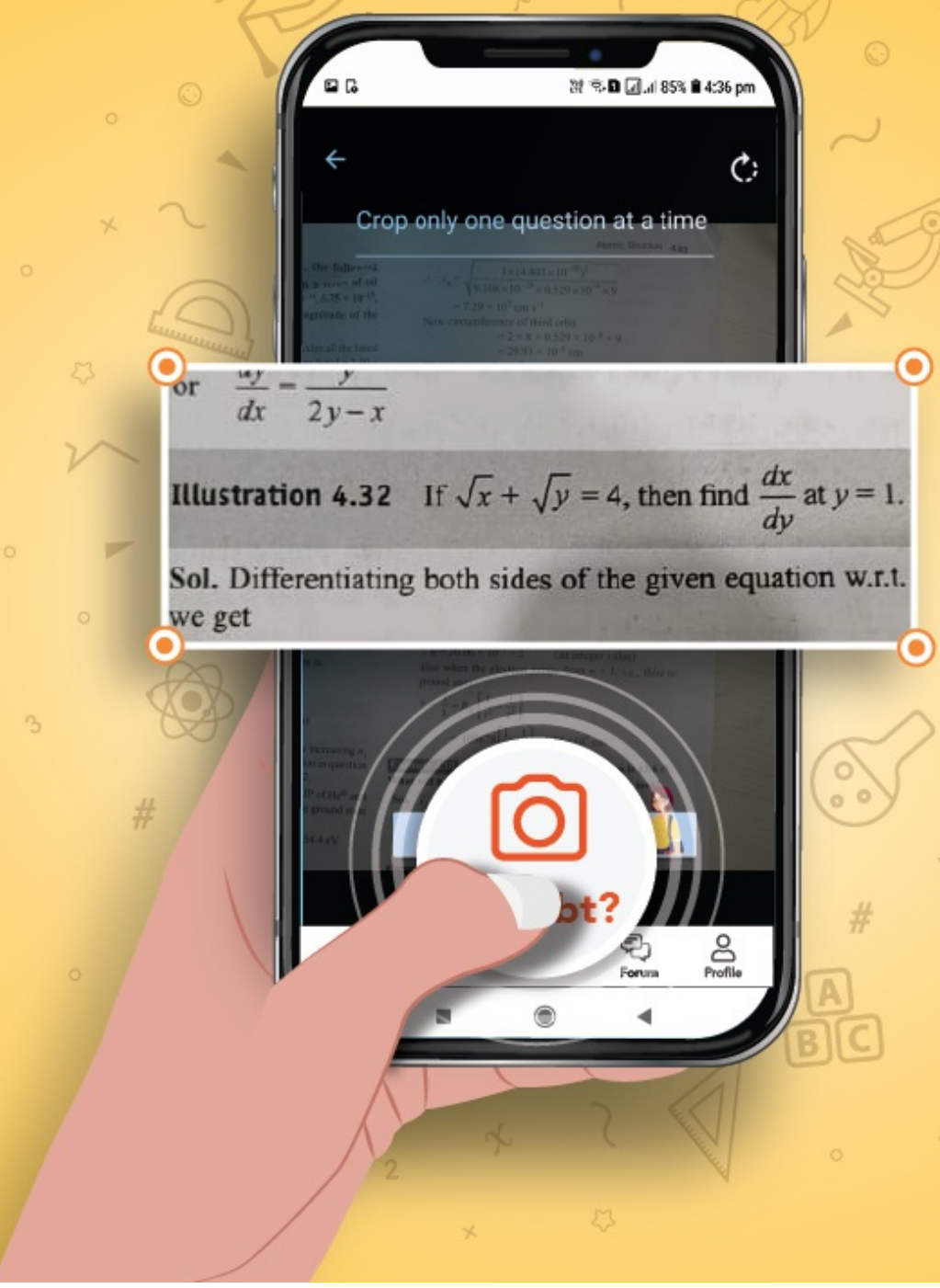
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