CBT OCTOBER 2024
CLASS – XI: BIOLOGY

GENERAL INSTRUCTION :

SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.
IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

CHAPTERS COVERED:
Chapter- Cell : the unit of life, Biomolecules and Cell cycle and cell division

Q.1: **Plant cells** are the cells present in green plants, photosynthetic eukaryotes of the kingdom Plantae. Their distinctive features include primary cell walls containing cellulose, hemicelluloses and pectin, the presence of plastids with the capability to perform photosynthesis and store starch, a large vacuole that regulates turgor pressure, the absence of flagella or centrioles, except in the gametes, and a unique method of cell division involving the formation of a cell plate or phragmoplast that separates the new daughter cells.

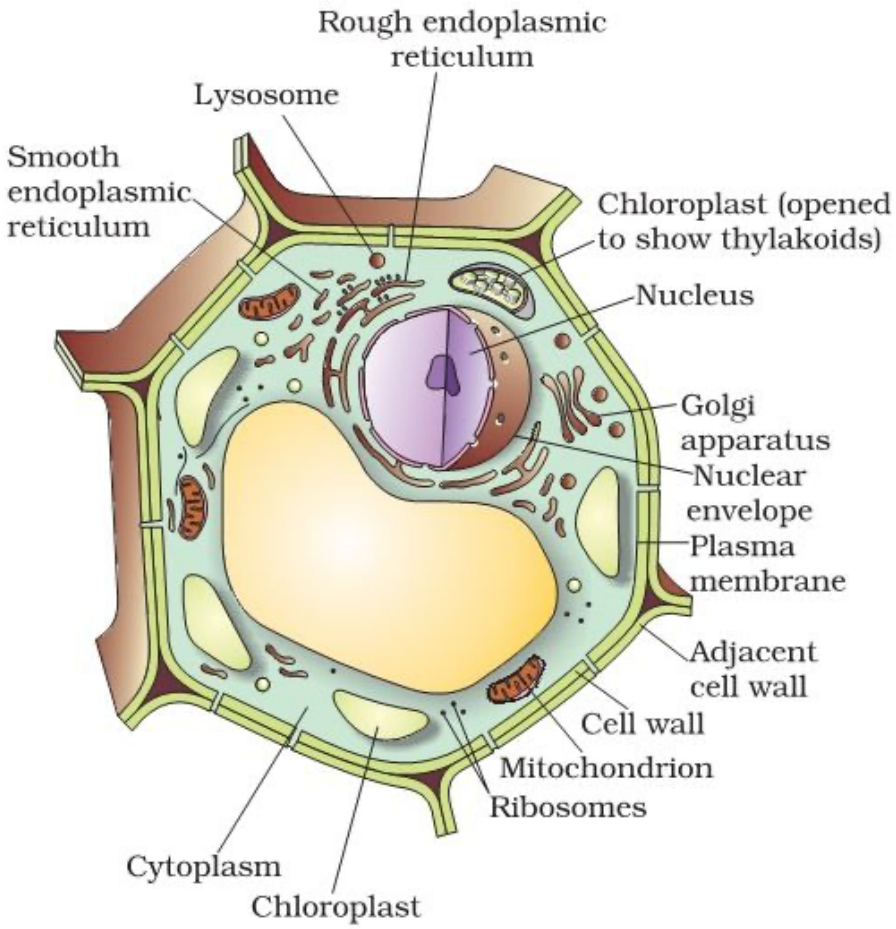


Fig. 5.6: *Plant cell*

1. Organelle X bears ribosomes on its outer surface. Organelle X and organelle Y together give rise to organelle Z which is often referred to as 'suicide bag' of cells. Identify organelles X, Y and Z and select the incorrect option regarding them.

(a) Organelle X takes part in formation of proteins.
(b) Organelle Z is bound by single membrane.
(c) Organelle Y is the main site of cellular respiration.
(d) Organelle Z is involved in autophagy

Answer. (c) Organelle Y is the main site of cellular respiration.

FEED BACK: Organelle X is Rough endoplasmic reticulum, Y is Golgi apparatus, Z is Lysosome. Organelle Y is not a site of cellular respiration rather it is involved in packaging, dispatching and storage of proteins.

2.Which of the following is an incorrect statement?

(a) Nuclear pores act as passages for proteins and RNA molecules in both directions between nucleus and cytoplasm.
(b) Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles.
(c) Microbodies are present both in plant and animal cells.
(d) The perinuclear space forms a barrier between the materials present inside the nucleus and that of the cytoplasm.

Answer. (b) Mature sieve tube elements possess a conspicuous nucleus and usual cytoplasmic organelles.

FEED BACK: Sieve tubes are considered living cells without a nucleus because the nucleus of companion cells controls their functional activities.

3.The shorter and longer arms of a submetacentric chromosome are referred to as

(a) m-arm and n- arm respectively
(b) s-arm and l- arm respectively
(c) p-arm and q- arm respectively
(d) q-arm and p- arm respectively

Answer. (c) p-arm and q- arm respectively

FEED BACK: The submetacentric chromosomes appear as L shaped. The two arms of the chromosome are referred to as P-arm and Q-arm. The p-arm is the shorter arm whereas the q arm is the longer arm

4.**Assertion**: The arrangement of axonemal microtubule in cilia or flagella is called 9 + 2 array.
Reason: The axoneme usually has nine pairs doublets of radially arranged peripheral microtubules and a pair of centrally located microtubules.

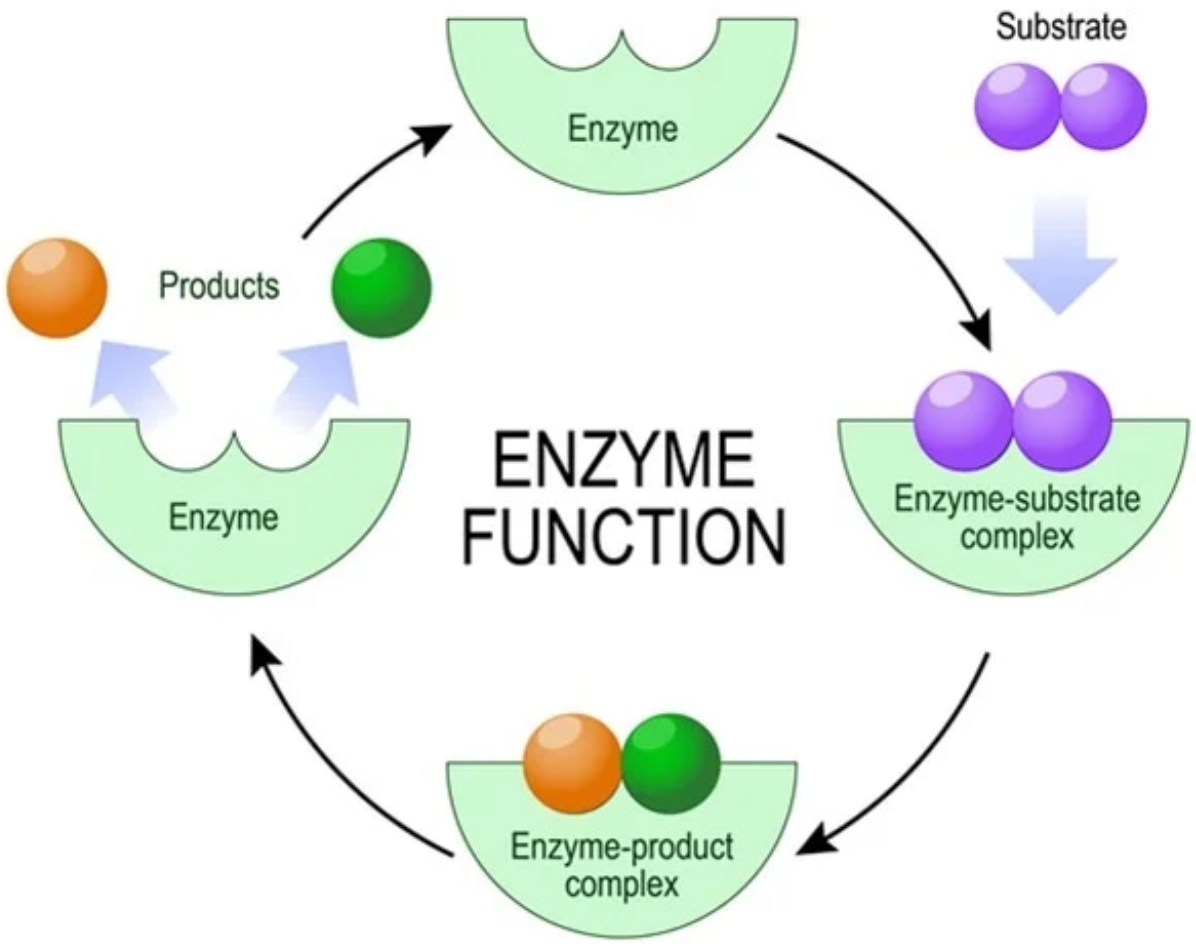
(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If assertion is false but reason is true.

Answer. (a) If both assertion and reason are true and reason is the correct explanation of assertion.

FEED BACK: The arrangement of axonemal microtubule in cilia or flagella is called 9 + 2 array. And the axoneme usually has nine pairs doublets of radially ararranged peripheral microtubules and a pair of centrally located microtubules.

Q.2: Enzymes are biological catalysts (also known as biocatalysts) that speed up biochemical reactions in living organisms. They can also be extracted from cells and then used to catalyse a wide range of commercially important processes. For example, they have important roles in the production of sweetening agents and the modification of antibiotics, they are used in washing powders and various cleaning products, and they play a key role in analytical devices and assays that have clinical, forensic and

environmental applications.While performing research experiments in biochemistry laboratory, Researchers observed some interesting properties of an enzyme called "Enzym-M."
Enzym-M is responsible for joining of two specific substrates into a product. The researchers are also studying the classification and inhibition of Enzym-M.



1. Which of the following correctly describes competitive enzyme inhibition?
A) The inhibitor binds to the active site of the enzyme.

B) The inhibitor binds to a different site on the enzyme.

C) The inhibitor increases the rate of the reaction.

D) The inhibitor does not resemble the substrate.

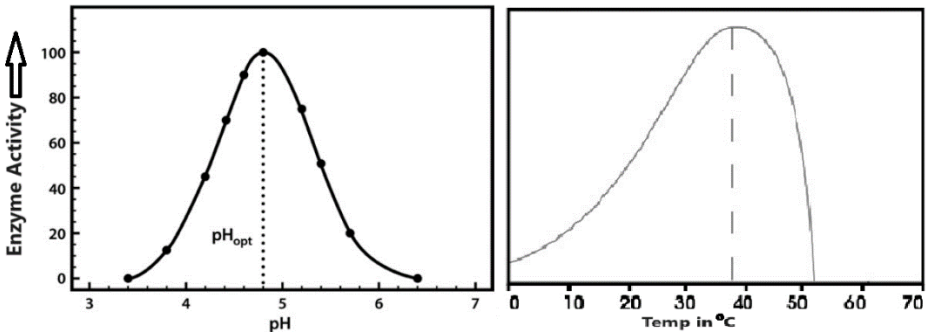
Answer. (A) The inhibitor binds to the active site of the enzyme.

FEED BACK: Competitive inhibition, in biochemistry, phenomenon in which a substrate molecule is prevented from binding to the active site of an enzyme by a molecule that is very similar in structure to the substrate. Thus, the inhibitor molecule and the substrate that the enzyme acts on "compete" for the same binding site.

2.. They also did experiment on the activity of the "Enzyme-M" in various temperature and pH range and obtained the following graph .Find out the optimum Temperature & pH of enzyme-M from the graph.

(a) pH = 4.2 , Temperature = 35 º C

(b) pH = 4.6 , Temperature = 37 º C



(c) pH = 4.8 , Temperature = 39 º C

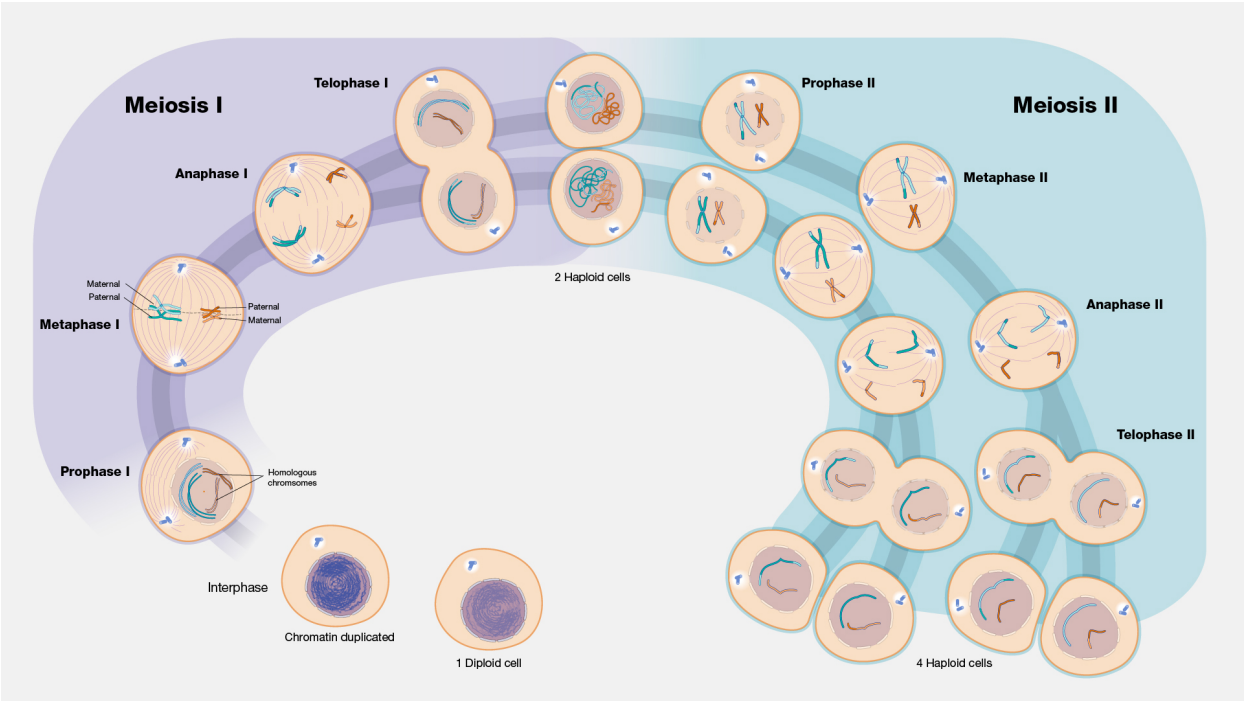
(d) pH = 4.4 , Temperature = 36 º C

Answer. (c) pH = 4.8 , Temperature = 39 º C

FEED BACK: According to the graph the optimum pH and Optimum temperature is 4.8 and 39 º C respectively.

3.**Assertion:** The protein part of the enzyme is called apoenzyme and non-protein part of the enzyme is called co-factor.
Reason: Zinc is a co-factor for the proteolytic enzyme carboxypeptidase.
(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 but reason is true.
Answer. (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
FEED BACK: Apoenzyme and holoenzyme are two enzyme states. The primary distinction between apoenzyme and holoenzyme is that apoenzyme is the enzyme's catalytically inactive protein component, whereas holoenzyme is the enzyme's catalytically active form, consisting of the apoenzyme and the cofactor. A cofactor is a non-protein chemical compound or metallic ion that is required for an enzyme's role as a catalyst. Zinc is a co-factor for the proteolytic enzyme carboxypeptidase.

Q.3: Meiosis is a type of cell division in sexually reproducing organisms that reduces the number of chromosomes in gametes (the sex cells, or egg and sperm). In humans, body (or somatic) cells are diploid, containing two sets of chromosomes (one from each parent).



1. Which of the following is correct about bivalent?
(i) Bivalents are tetrads.
(ii) A bivalent means 4 chromatids and 2 centromeres.
(iii) One bivalent consists of 2 homologous chromosomes.
(iv) Bivalents form in zygotene.

(a) (i), (ii), (iii) and (iv)
(b) (iii) only
(c) (iii) and (iv)
(d) (iv) only
Answer. (a) (i), (ii), (iii) and (iv)
FEED BACK: In meiosis I, during prophase, the homologous chromosomes pair, and form synapses. The paired chromosomes are known as bivalent and consist of two chromosomes with two sister chromatids, thereby four sister chromatids of homologous chromosomes are linked together by charisma, thus forming a tetrad.

2.Diplotene stage of prophase-I is characterised by
(a) dissolution of synaptonemal complex
(b) separation of synapsed homologous chromosomes except at the site of crossovers
(c) formation of X-shaped structures called chiasmata
(d) all of these.
Answer. (d) all of these.
FEED BACK: Diplotene stage of prophase-I is characterised by all of the following events.
(a) dissolution of synaptonemal complex
(b) separation of synapsed homologous chromosomes except at the site of crossovers
(c) formation of X-shaped structures called chiasmata

3. **Assertion**: The stage between the two meiotic divisions is called interkinesis.
Reason: Interkinesis is generally short lived.
(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 but reason is true.

Answer. (b) If both assertion and reason are true but reason is not the correct explanation of assertion.
FEED BACK: Interkinesis or interphase II is a period of rest that cells of some species enter during meiosis between meiosis I and meiosis II. No DNA replication occurs during interkinesis; however, replication does occur during the interphase I stage of meiosis