CDS 2019 (1 and 2) PYQs Biology

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Which one of the following functions is not carried out by smooth endoplasmic reticulum ? [2019- I]

(a) Transport of materials

(b) Synthesis of lipid

(c) Synthesis of protein

(d) Synthesis of steroid hormone

Answer (c)

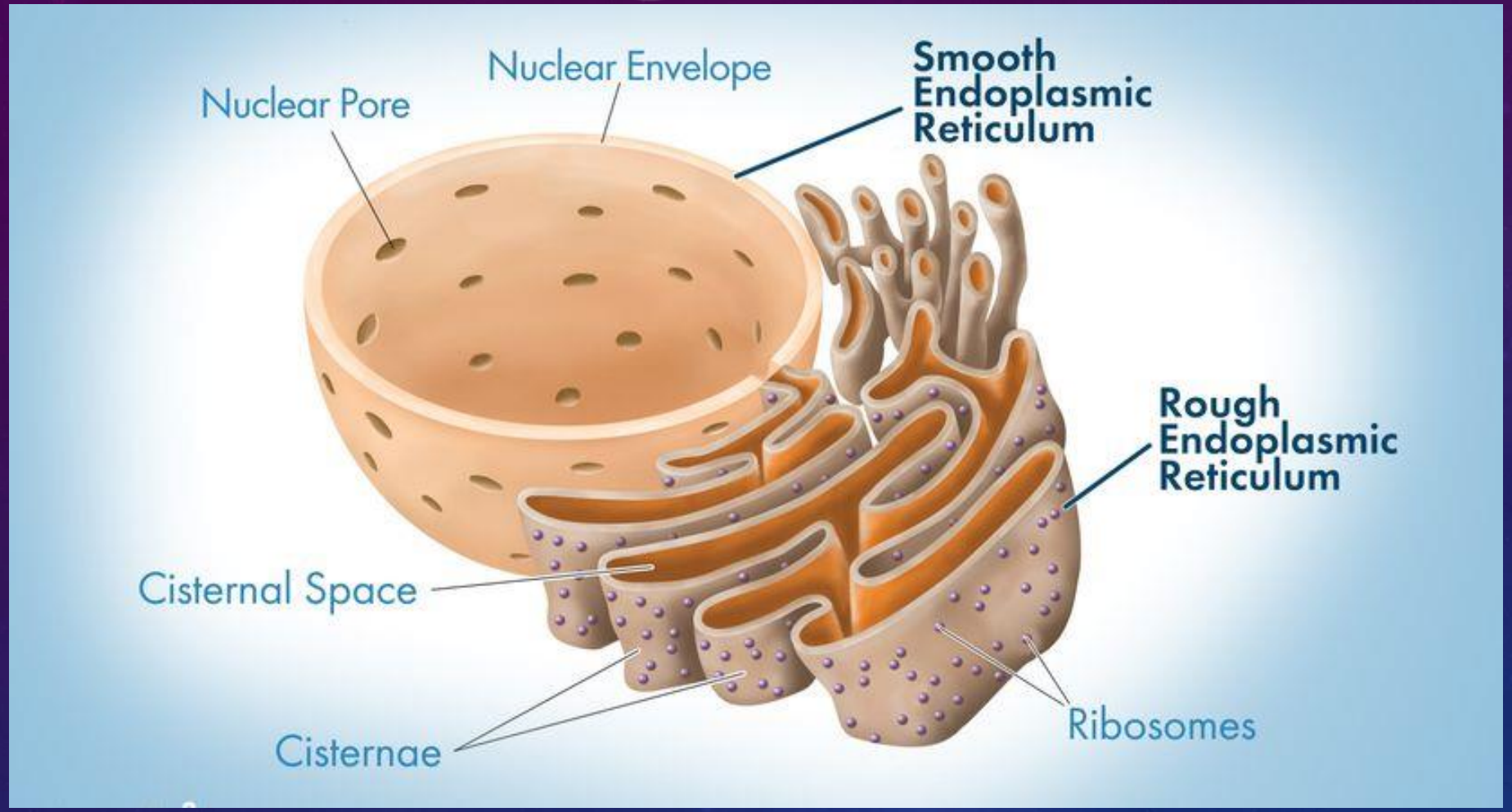
The smooth endoplasmic reticulum (smooth ER) is continuous with the rough ER but has few or no ribosomes on its cytoplasmic surface. Functions of the smooth ER include: Synthesis of carbohydrates, lipids, and steroid hormones.

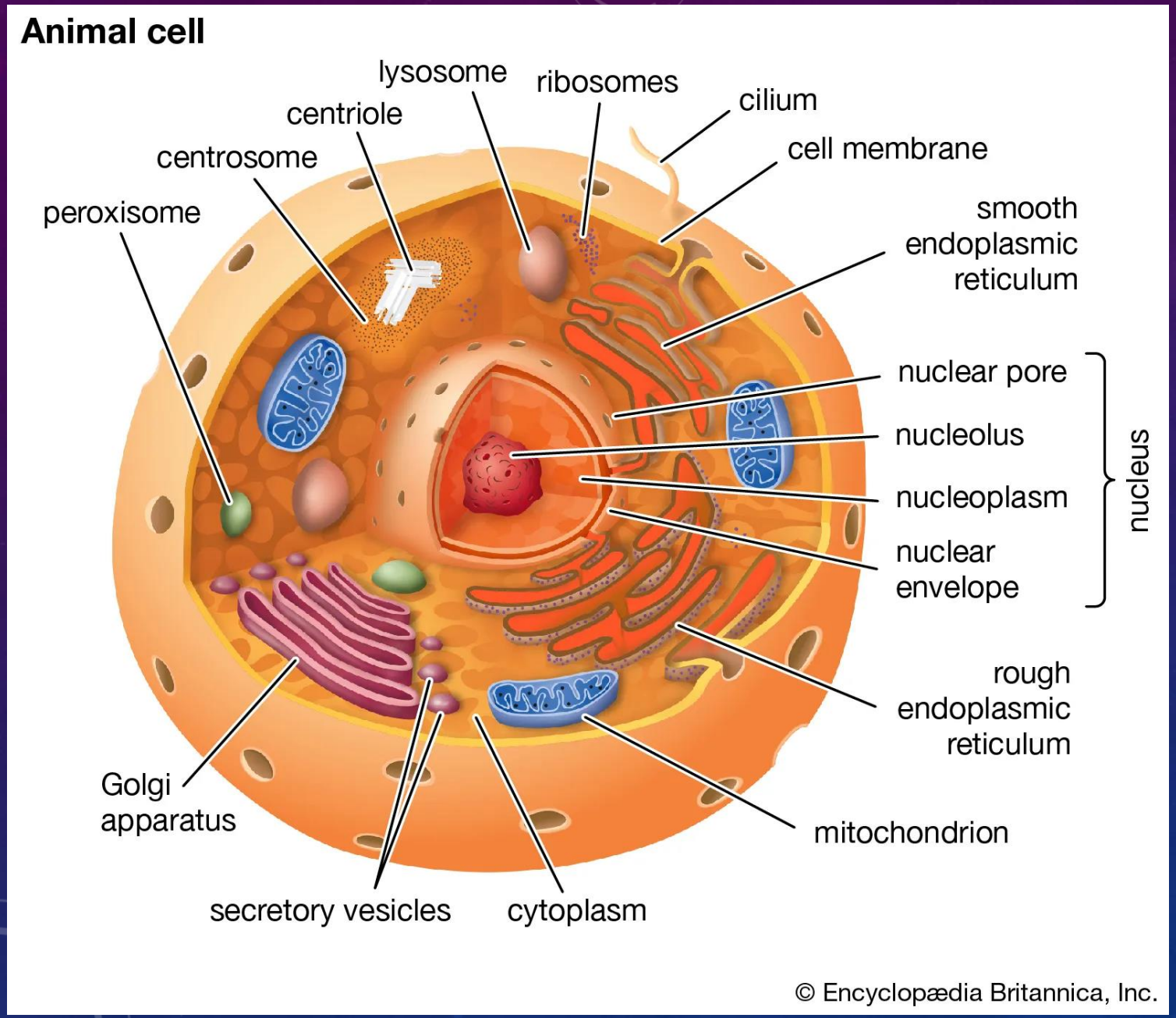
Transport of materials: The smooth endoplasmic reticulum (SER) helps transport materials within the cell, including lipids and steroids.

Synthesis of lipid: The SER is involved in synthesizing lipids, including phospholipids and cholesterol.

Synthesis of protein: This function is primarily carried out by the rough endoplasmic reticulum (RER), which has ribosomes attached to its surface for protein synthesis.

Synthesis of steroid hormone: The SER is crucial for synthesizing steroid hormones, such as those produced in the adrenal glands and gonads.





Q. Which one of the following cell organelles mainly functions as storehouse of digestive enzymes? [2019- I]

(a) Desmosome

(b) Ribosome

(c) Lysosome

(d) Vacuoles

Answer (c)

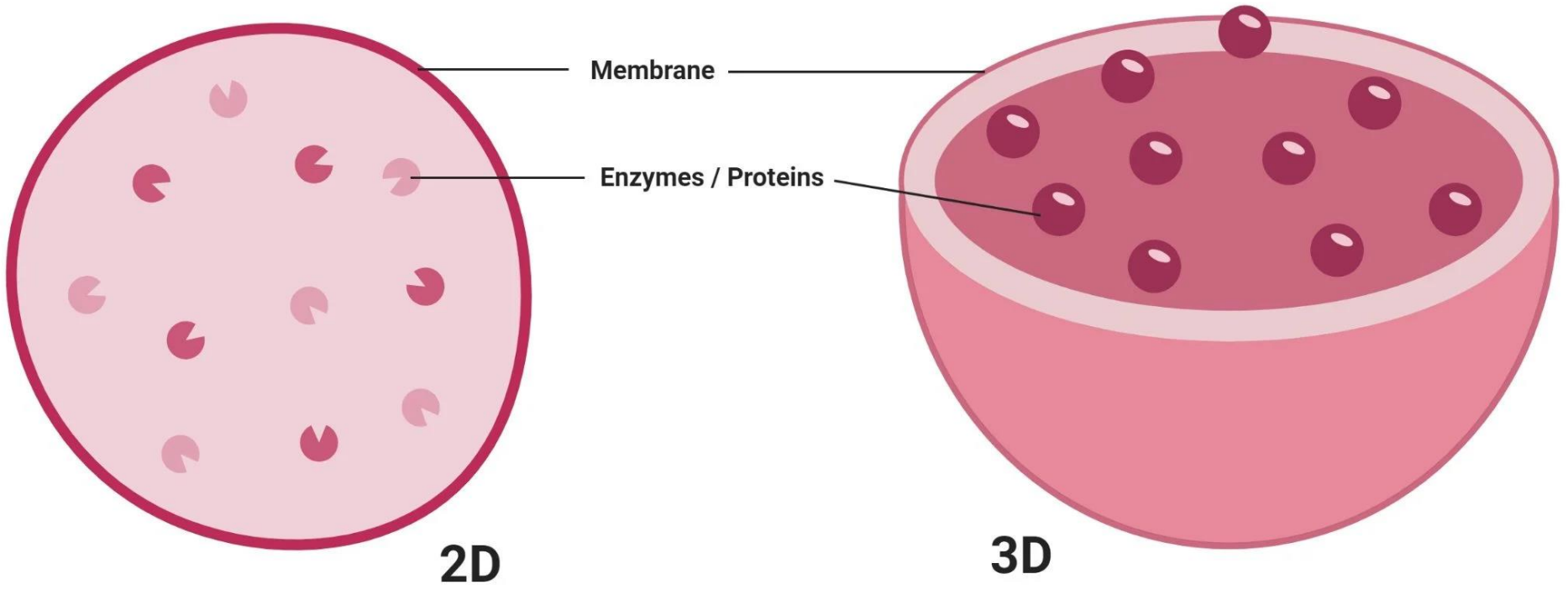
(a) **Desmosome**: Incorrect. Desmosomes are structures that attach cells together, providing mechanical stability, not storing digestive enzymes.

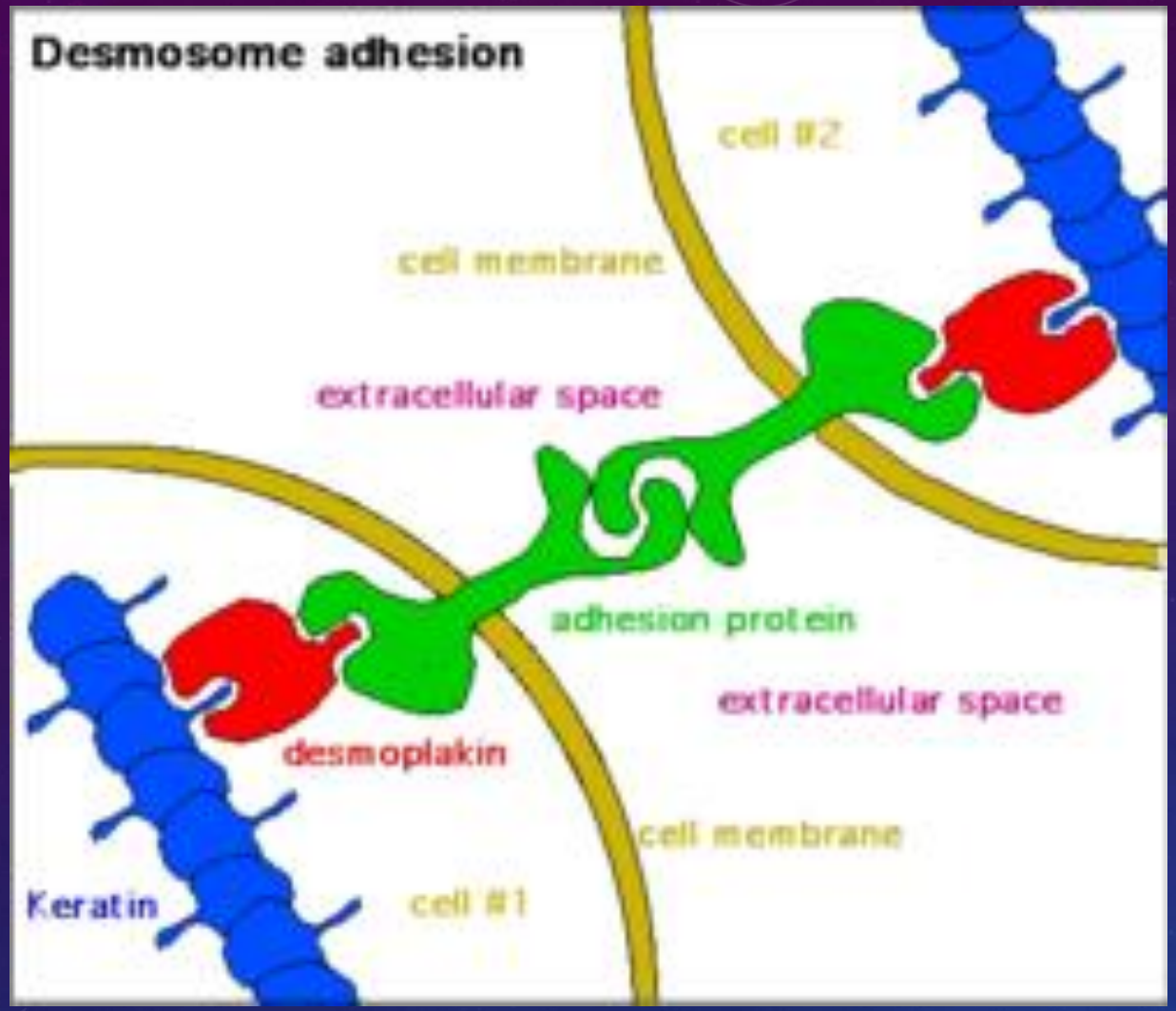
(b) **Ribosome**: Incorrect. Ribosomes are responsible for protein synthesis, not storing digestive enzymes.

(c) **Lysosome**: Correct. Lysosomes contain digestive enzymes that break down waste materials and cellular debris, making them the storehouse of digestive enzymes.

(d) **Vacuoles**: Incorrect. Vacuoles primarily store nutrients, waste products, and maintain cell pressure, but they do not specialize in storing digestive enzymes.

Lysosomes





Q. Which one of the following tissues is responsible for increase of girth in the stem of a plant ? [2019-I]

(a) Tracheid

(b) Pericycle

(c) Intercalary meristem

(d) Lateral meristem

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SHAPING CAREERS WITH DEVOTION

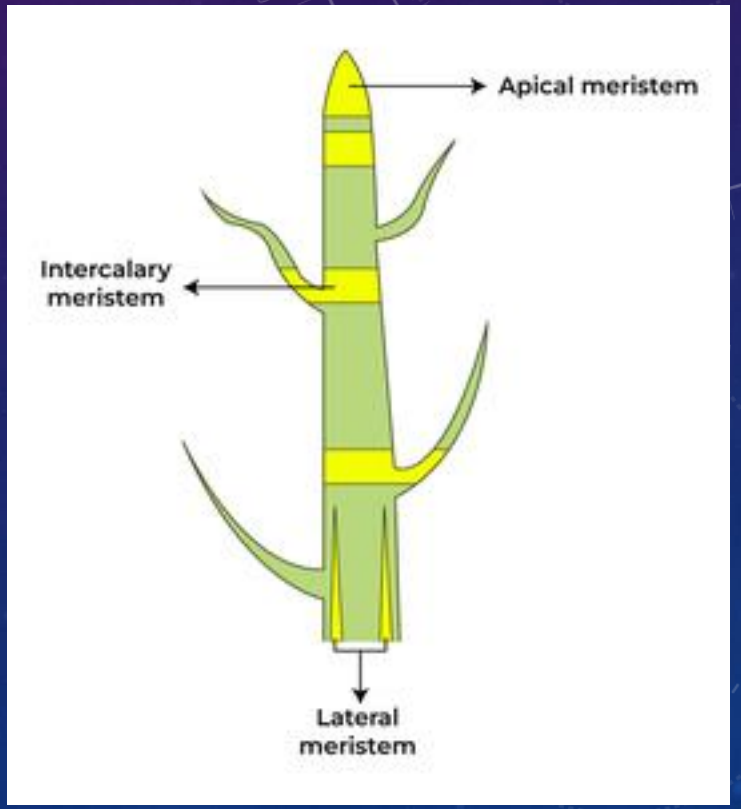
Answer (d)

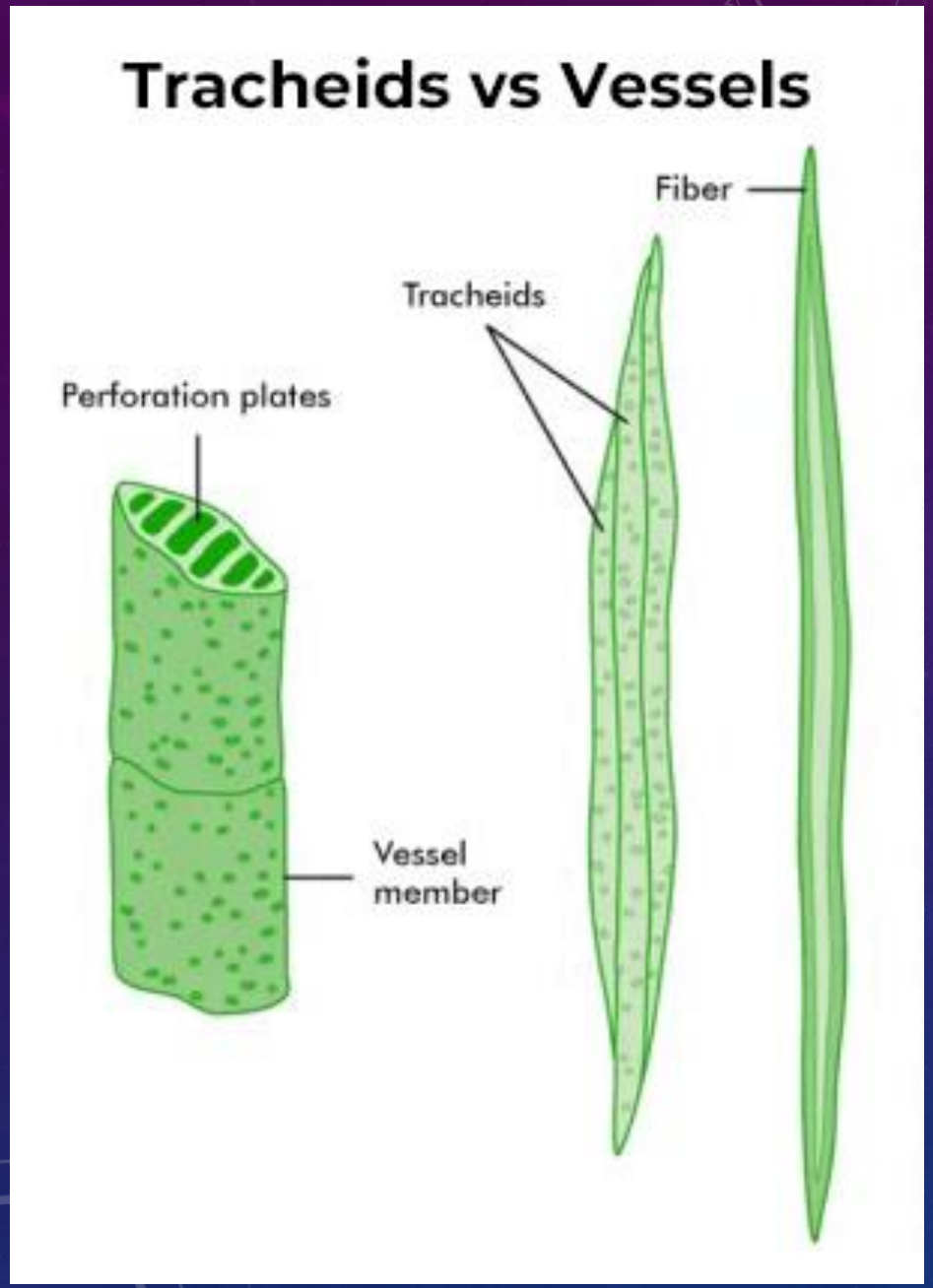
(a) **Tracheid**: Incorrect. Tracheids are involved in the transport of water and minerals within the plant, not in increasing stem girth.

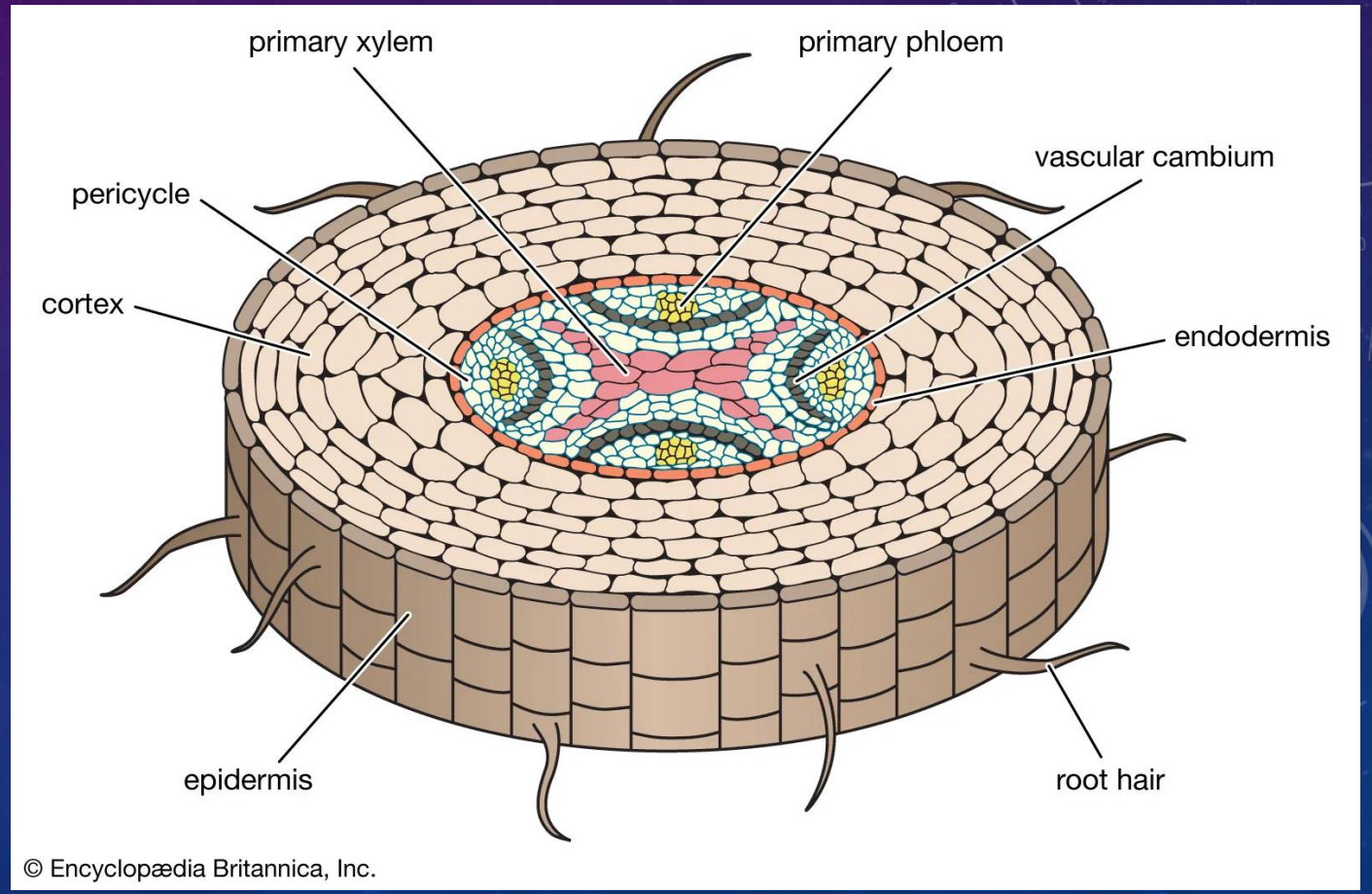
(b) **Pericycle**: Incorrect. The pericycle is found in the roots and is involved in the formation of lateral roots, not in stem thickening.

(c) **Intercalary meristem**: Incorrect. The intercalary meristem is responsible for the growth in length of the plant at the base of leaves or internodes, not in girth.

(d) **Lateral meristem**: Correct. The lateral meristem, which includes the vascular cambium and cork cambium, is responsible for the increase in girth in the stem of a plant.







Q. Which one of the following organisms is dependent on saprophytic mode of nutrition ? [2019-I]

(a) Agaricus
(b) Ulothrix
(c) Riccia
(d) Cladophora

Answer (a)

(a) **Agaricus**: Correct. Agaricus (a genus of mushrooms) is a saprophytic organism that feeds on decaying organic matter.

(b) **Ulothrix**: Incorrect. Ulothrix is a green alga that performs photosynthesis and is not saprophytic.

(c) **Riccia**: Incorrect. Riccia is a type of liverwort that is autotrophic, meaning it produces its own food through photosynthesis, not by feeding on decaying matter.

(d) **Cladophora**: Incorrect. Cladophora is a filamentous green alga that also relies on photosynthesis and is not saprophytic.

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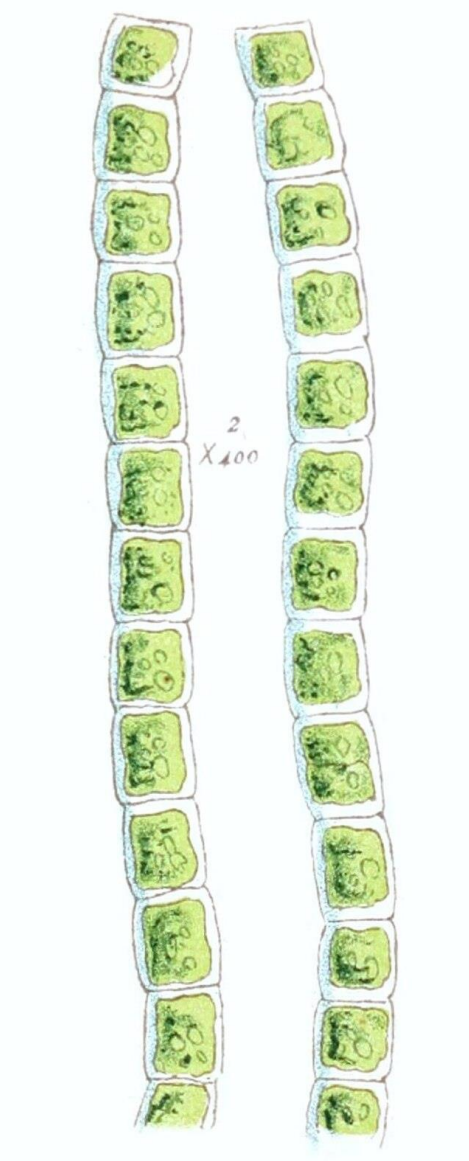
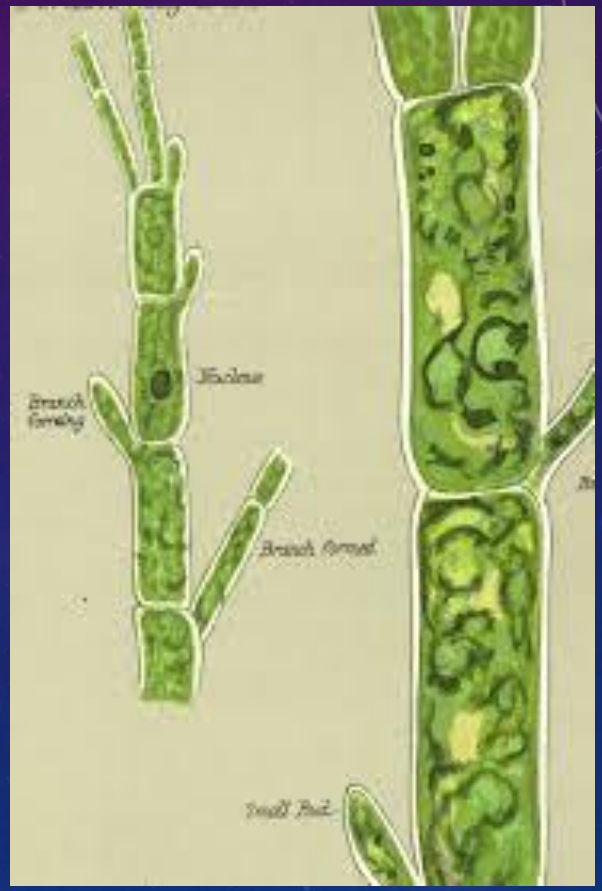
Agaricus

Ulothrix:



Riccia

Cladophora



Q. Which one of the following has a bilateral symmetry in its body organization ? [2019-I]

(a) Asterias

(b) Sea anemone

(c) Nereis

(d) Echinus

Answer (c)

(a) **Asterias**: Incorrect. Asterias, a starfish, has radial symmetry, meaning its body can be divided into multiple identical parts around a central axis.

(b) **Sea anemone**: Incorrect. Sea anemones also exhibit radial symmetry, with body parts arranged around a central point.

(c) **Nereis**: Correct. Nereis, a type of segmented worm, has bilateral symmetry, with its body divided into two mirror-image halves.

(d) **Echinus**: Incorrect. Echinus, a sea urchin, also has radial symmetry, particularly in its adult form.

Asterias

Sea anemone

Nereis

Echinus

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Q. Which one of the following pairs of animals is warm- blooded ? [2019-I]

(a) Crocodile and Ostrich

(b) Hagfish and Dogfish

(c) Tortoise and Ostrich

(d) Peacock and Camel

Answer (d)

(a) **Crocodile and Ostrich**: Incorrect. Crocodiles are cold-blooded reptiles, while ostriches are warm-blooded birds.

(b) **Hagfish and Dogfish**: Incorrect. Both hagfish and dogfish are fish, and fish are generally cold-blooded.

(c) **Tortoise and Ostrich**: Incorrect. Tortoises are cold-blooded reptiles, while ostriches are warm-blooded birds.

(d) **Peacock and Camel**: Correct. Both peacocks (birds) and camels (mammals) are warm-blooded animals.

COLD BLOODED ANIMALS
VERSUS
WARM BLOODED ANIMALS

Cold blooded animals cannot maintain a constant body temperature	Warm blooded animals can maintain a constant body temperature
Animals always gain energy in the form of heat to regulate body heat	Can produce heat within their body
Obtain heat through the surrounding environment	Obtain energy mainly through consumption of food
Metabolic rates always change with changing environmental temperature	Environmental temperature does not greatly affect the body heat
Body temperature varies with surrounding temperature	The body temperature is usually between 35-40 °C
Regulate heat by various methods including bathing in the sun & changing the body colors	Regulate heat mainly by metabolic processes and adaptive mechanisms such as sweating, panting & hibernation
Fish, reptiles, amphibians, insects, etc. are examples	Mammals and birds are examples

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SHAPING CAREERS WITH DEVOTION

Q. Which one of the following statements regarding histone proteins is correct? [2019-I]

(a) Histones are proteins that are present in mitochondrial membrane.

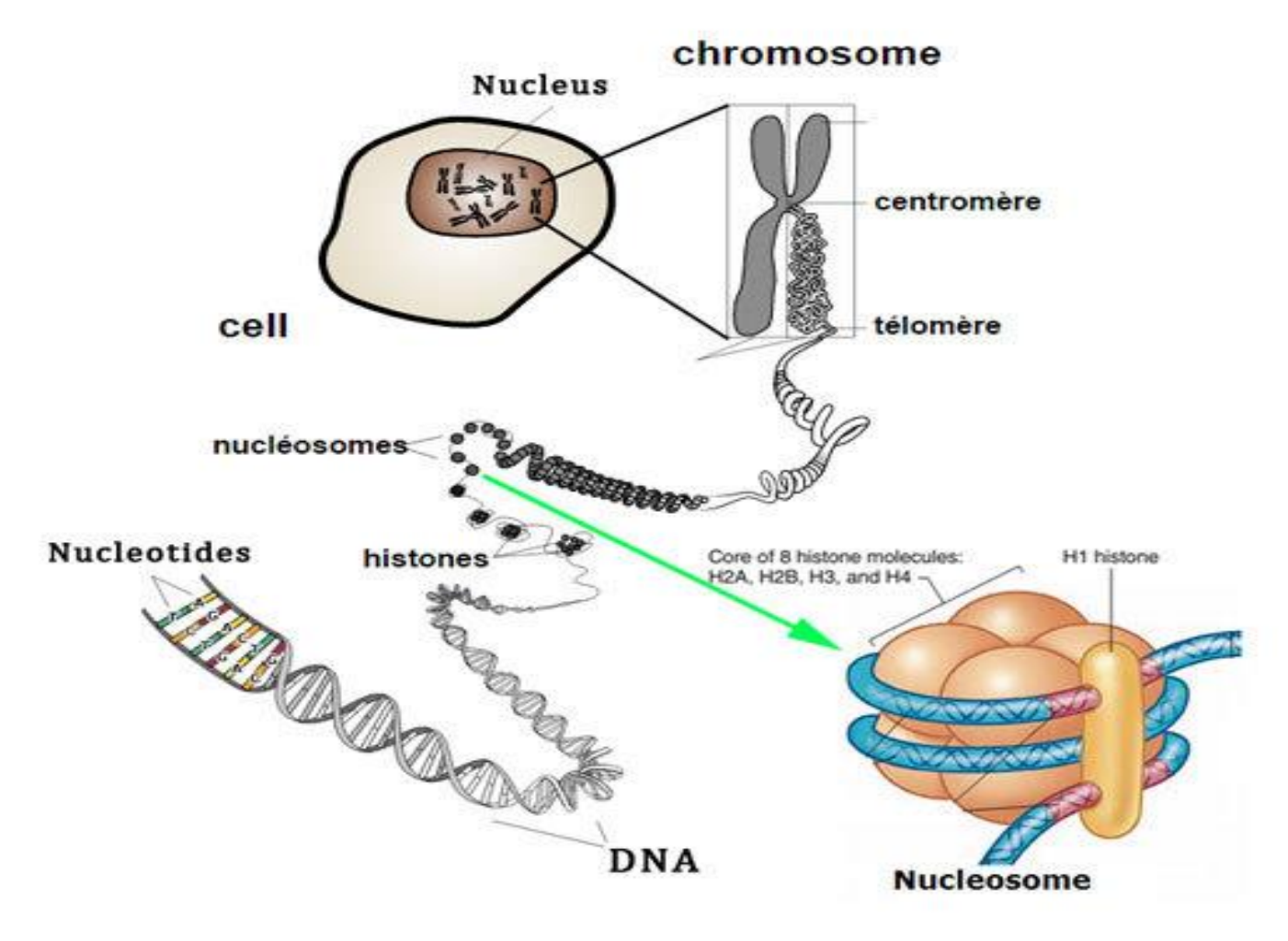
(b) Histones are proteins that are present in nucleus in association with DNA.

(c) Histones are proteins associated with lipids in the cytosol.

(d) Histones are proteins associated with carbohydrates in the cytosol.

Answer (b)

(b) Histones are proteins that are present in nucleus in association with DNA: Correct. Histones are proteins that help package and organize DNA into structural units called nucleosomes in the nucleus.



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(a) Histones are proteins that are present in mitochondrial membrane:

•Function of the mitochondrial membrane: The mitochondrial membrane is primarily involved in energy production through the process of oxidative phosphorylation. It contains proteins such as ATP synthase, transport proteins, and enzymes necessary for cellular respiration, but not histones.

(c) Histones are proteins associated with lipids in the cytosol:

•Function of lipids in the cytosol: Lipids in the cytosol serve various functions, including forming cellular membranes, storing energy, and acting as signaling molecules. However, histones are not associated with these lipids; they are confined to the nucleus where they interact with DNA.

(d) Histones are proteins associated with carbohydrates in the cytosol:

•Function of carbohydrates in the cytosol: Carbohydrates in the cytosol are mainly involved in energy storage and metabolism, such as in the form of glycogen or glucose. They play roles in glycolysis and other metabolic pathways, but histones are not involved with carbohydrates in the cytosol.

Q. Which one of the following statements regarding haemoglobin is correct ? [2019-I]

(a) Haemoglobin present in RBC can carry only oxygen but not carbon dioxide.

(b) Haemoglobin of RBC can carry both oxygen and carbon dioxide.

(c) Haemoglobin of RBC can carry only carbon dioxide.

(d) Haemoglobin is only used for blood clotting and not for carrying gases.

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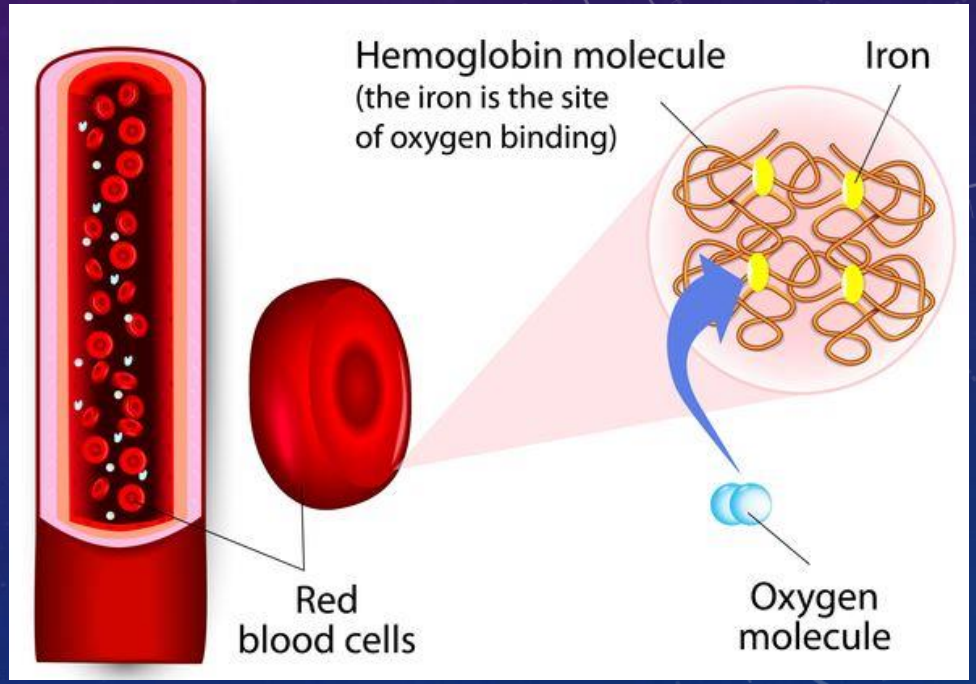
Answer (b)

(a) **Haemoglobin present in RBC can carry only oxygen but not carbon dioxide**: Incorrect. Hemoglobin carries both oxygen and carbon dioxide. It binds oxygen in the lungs and transports it to tissues, and it also carries carbon dioxide from tissues back to the lungs for exhalation.

(b) **Haemoglobin of RBC can carry both oxygen and carbon dioxide**: Correct. Hemoglobin has the ability to bind and transport both oxygen and carbon dioxide, playing a key role in gas exchange in the body



(c) Haemoglobin of RBC can carry only carbon dioxide: Incorrect. While hemoglobin does carry carbon dioxide, it is also crucial for oxygen transport. It binds oxygen in the lungs and releases it in tissues, while also picking up carbon dioxide for removal.

(d) Haemoglobin is only used for blood clotting and not for carrying gases: Incorrect. Hemoglobin is not involved in blood clotting; its primary function is gas transport. Blood clotting involves other proteins like fibrinogen, not hemoglobin.

Q. Which one of the following statements is correct ? [2019-I]

(a) Urea is produced in liver.

(b) Urea is produced in blood.

(c) Urea is produced from digestion of starch.

(d) Urea is produced in lung and kidney.

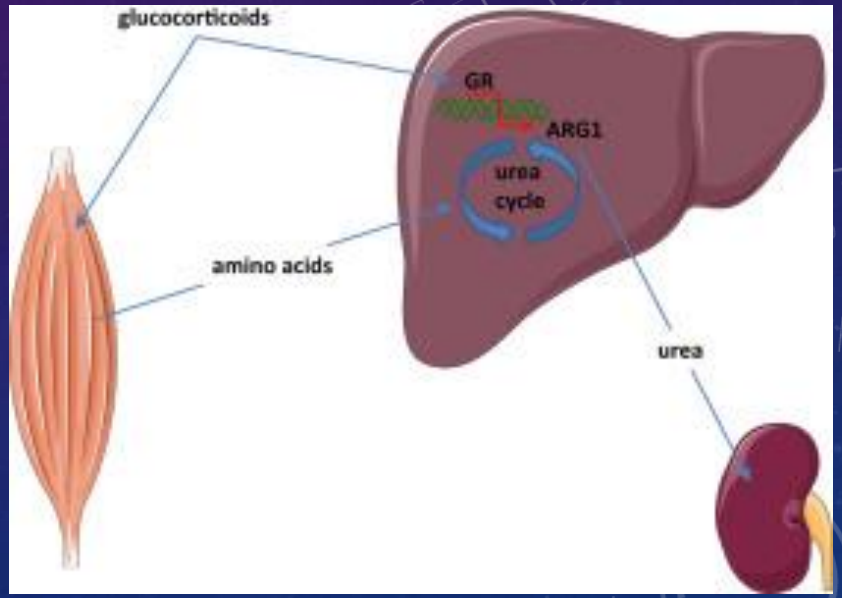
Answer (a)

(a) **Urea is produced in liver**: Correct. Urea is produced in the liver as a result of the urea cycle, where ammonia, a toxic byproduct of protein metabolism, is converted into urea, which is then excreted by the kidneys.

(b) **Urea is produced in blood**: Incorrect. Urea is not produced in the blood; it is transported by the blood to the kidneys for excretion after being produced in the liver.

(c) **Urea is produced from digestion of starch**: Incorrect. Urea is not related to starch digestion. Urea is a byproduct of protein metabolism, not carbohydrate digestion.

(d) **Urea is produced in lung and kidney**: Incorrect. Urea is not produced in the lungs or kidneys. The kidneys are responsible for filtering urea out of the blood, but the production occurs in the liver.



Q. Which one of the following is not found in animal cells ? [2019-II]

(a) Free ribosomes

(b) Mitochondria

(c) Nucleolus

(d) Cell wall

Answer (d)

Free ribosomes: Present in animal cells and involved in protein synthesis.

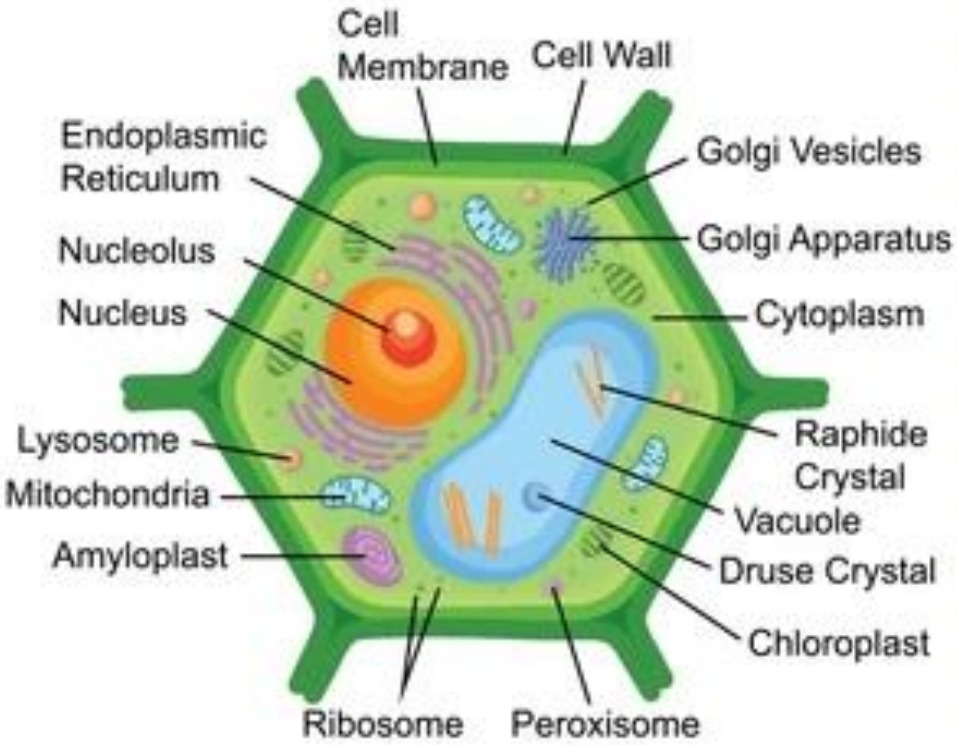
Mitochondria: Found in animal cells and are the energy-producing organelles.

Nucleolus: Found within the nucleus of animal cells and is involved in ribosome production.

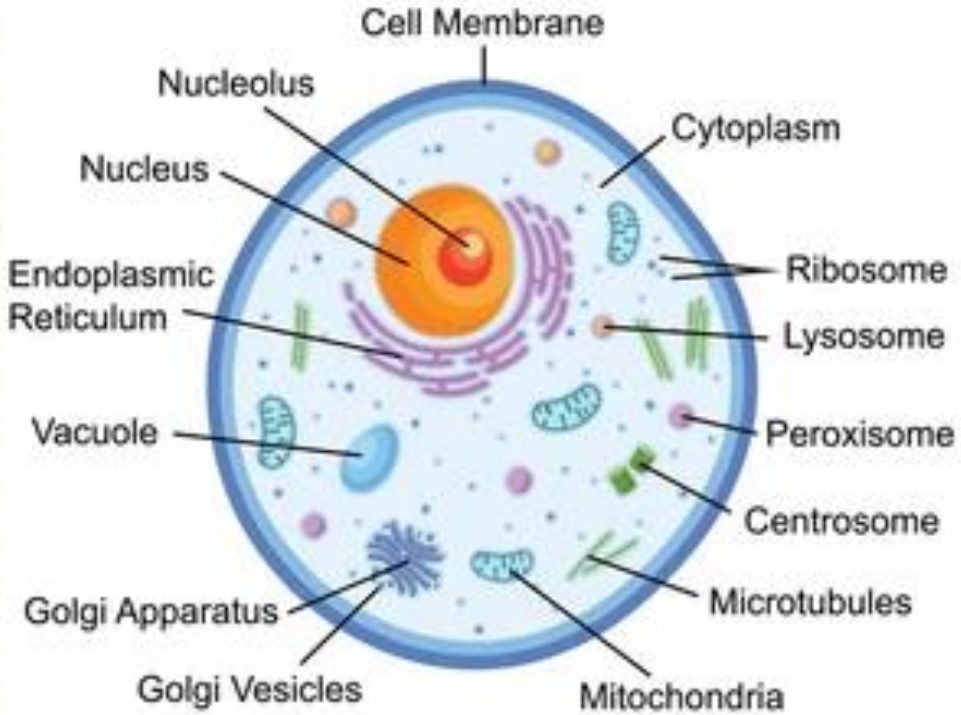
Cell wall: Not found in animal cells; it is present in plant cells, providing structure and support.

Animal cells lack a cell wall, which distinguishes them from plant cells.

PLANT CELL



ANIMAL CELL



Q. Marsilea, Fern and Horse-tail are examples of which one of the following plant groups ? [2019-II]

(a) Pteridophyta
(b) Bryophyta
(c) Gymnosperms
(d) Angiosperms

Answer (a)

Pteridophyta: Includes ferns, horse-tails, and Marsilea; these are seedless vascular plants.

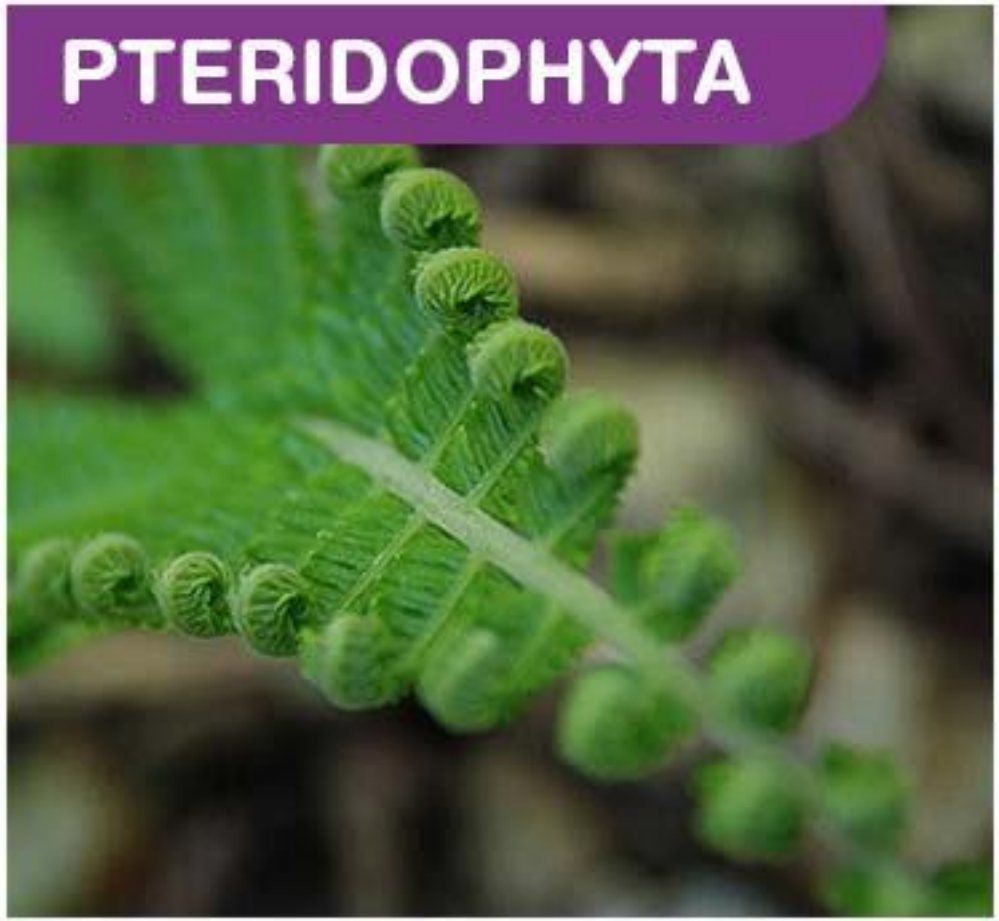
Bryophyta: Includes mosses and liverworts; they are non-vascular plants.

Gymnosperms: Includes conifers like pine and spruce; they produce seeds without flowers.

Angiosperms: Includes flowering plants that produce seeds enclosed within a fruit.

Marsilea (water clover), ferns, and horse-tails are all part of Pteridophyta.

PTERIDOPHYTA



Q. Which one of the following organisms is responsible for sleeping sickness ? [2019-II]

(a) Leishmania

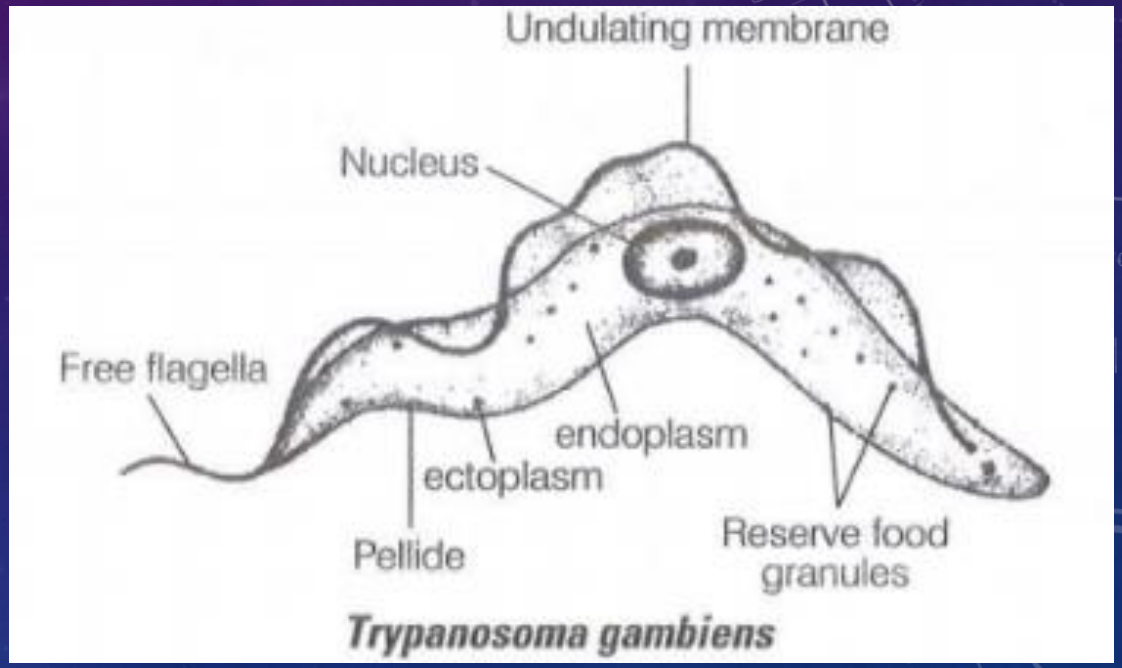
(b) Trypanosoma

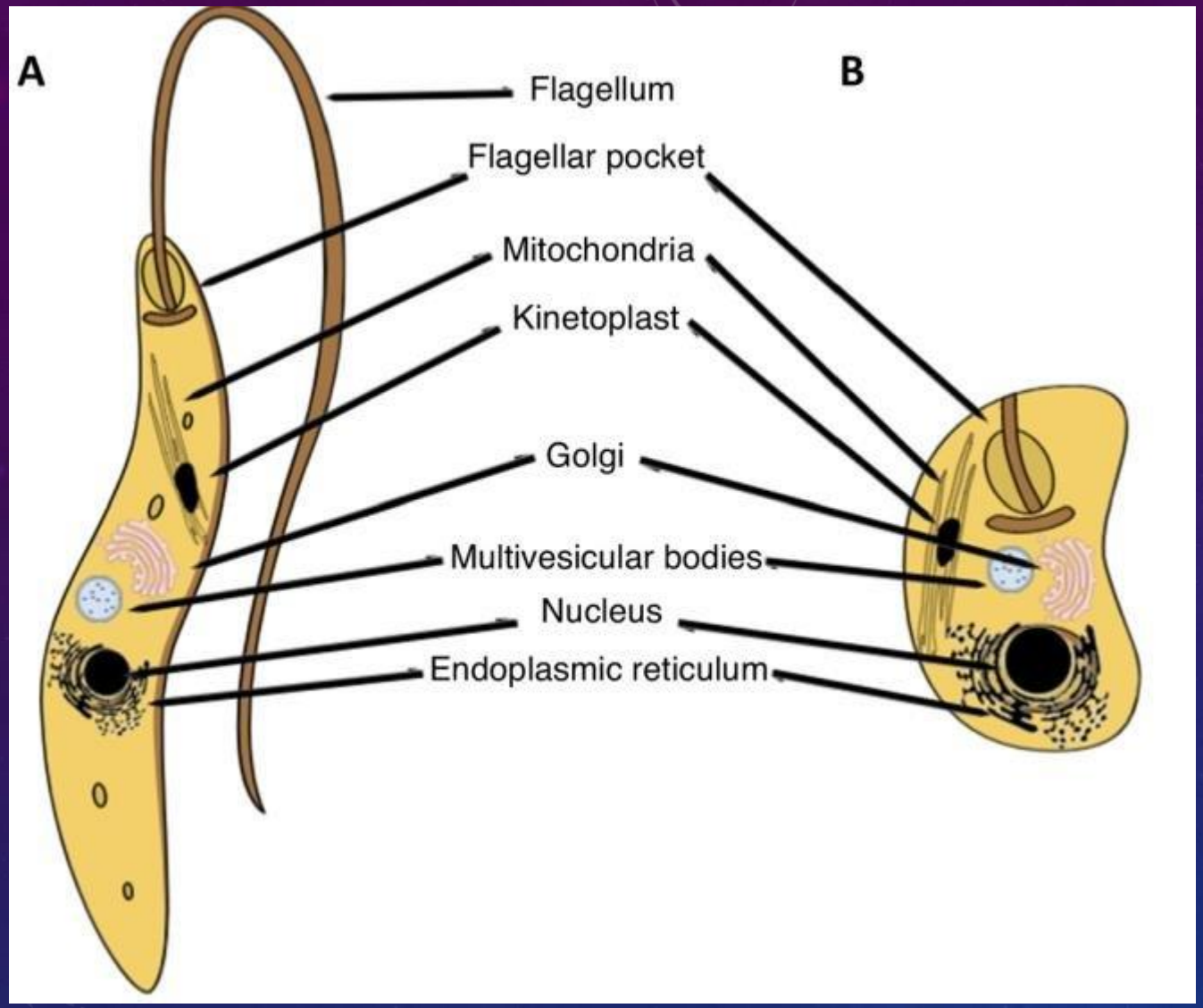
(c) Ascaris

(d) Helicobacter

Answer (b)

Leishmania: Causes leishmaniasis, affecting skin and internal organs.
Trypanosoma: Trypanosoma brucei causes sleeping sickness, transmitted by the tsetse fly.
Ascaris: Causes ascariasis, a parasitic worm infection in the intestines.
Helicobacter: Helicobacter pylori causes stomach ulcers and gastritis.





Leishmania

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Ascaris

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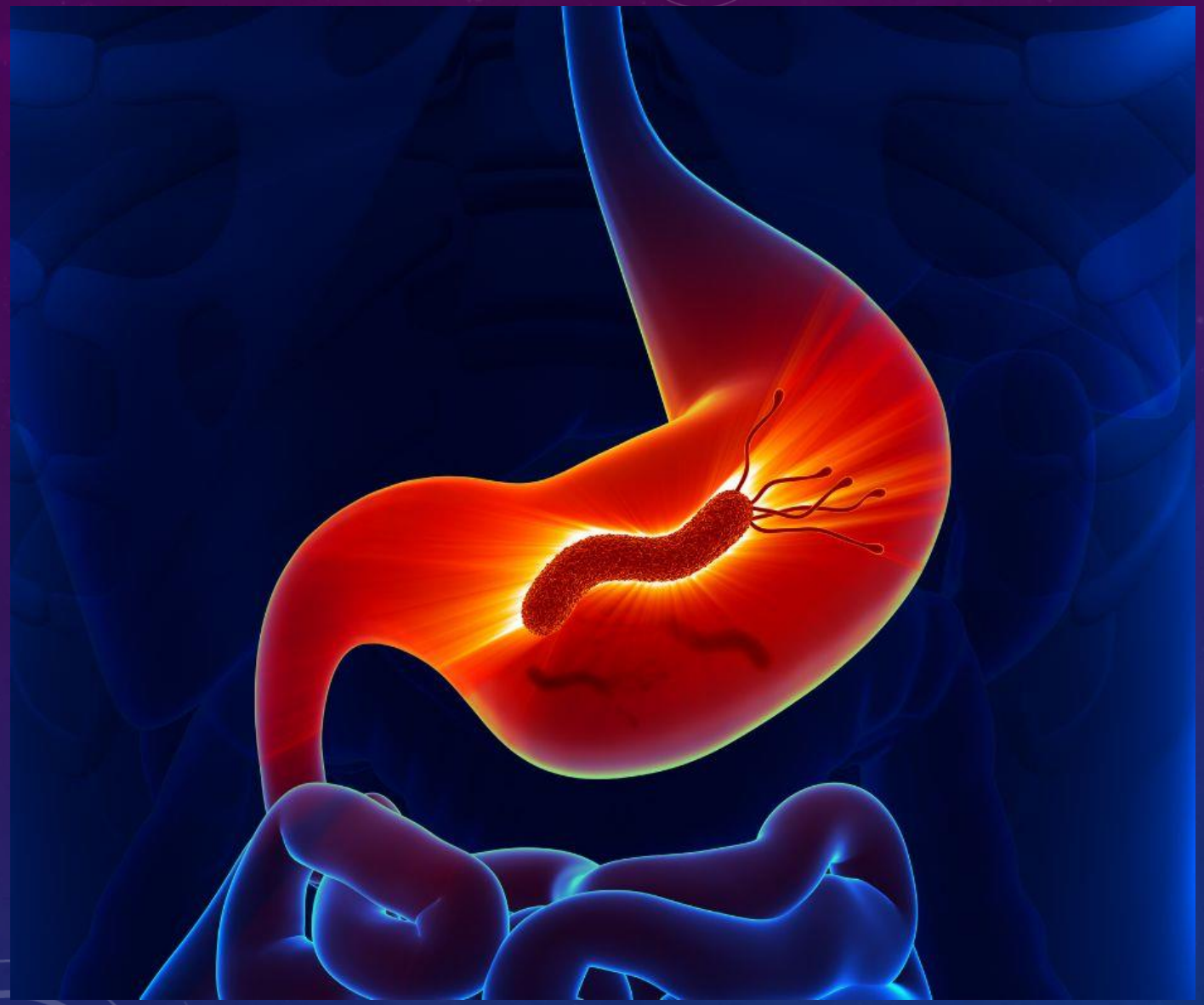

Helicobacter

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Q. Which one of the following body parts/organs of the human body does not have smooth muscles ? [2019-II]

(a) Ureters

(b) Iris of eye

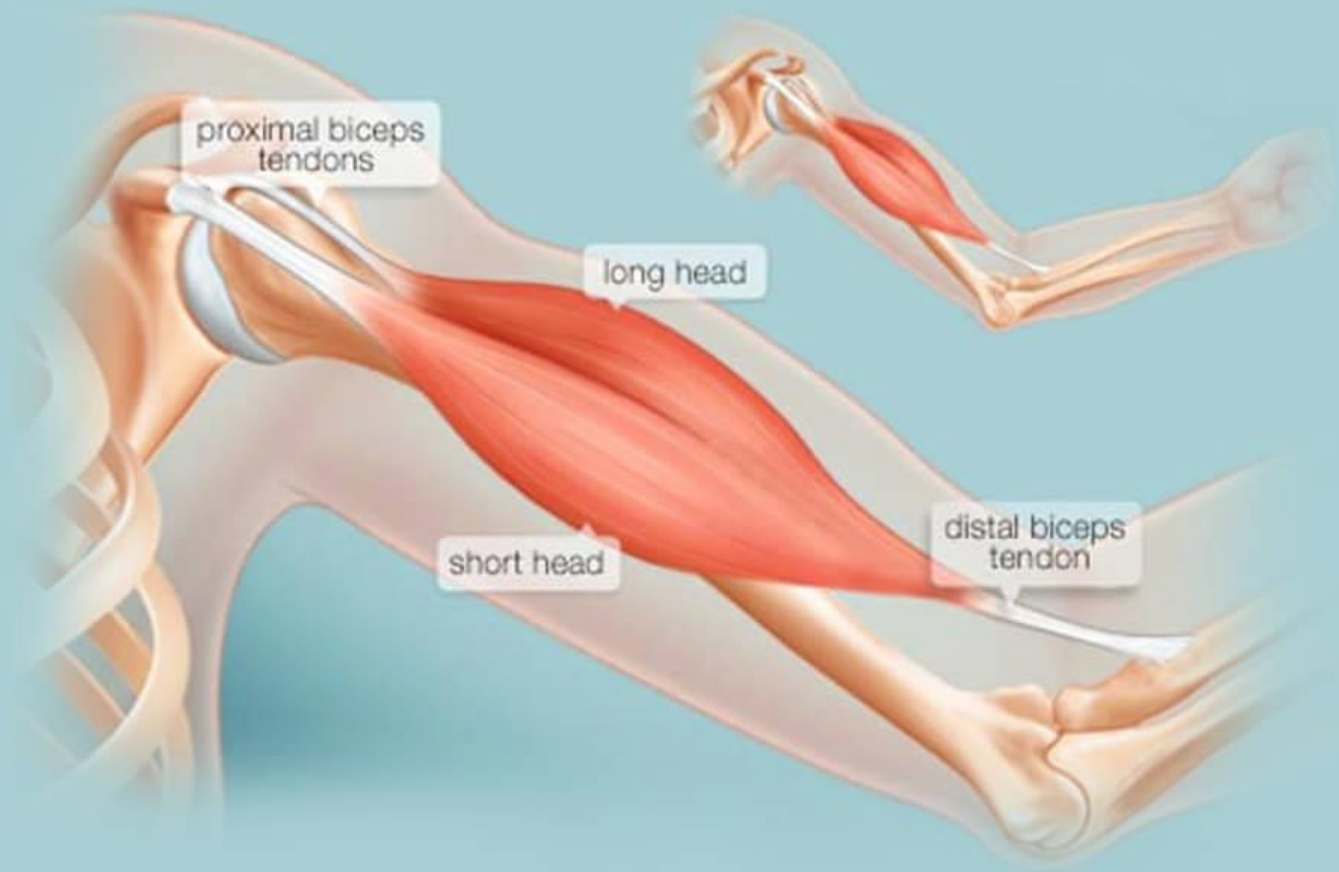
(c) Bronchi of lungs

(d) Biceps

Answer (d)

- Smooth muscles are involuntary muscles found in various organs and systems throughout the body.
- They are characterized by their non-striated, spindle-shaped cells and are controlled automatically by the autonomic nervous system.
- Smooth muscles are crucial for controlling various internal processes without conscious effort.

Biceps



Ureters: Have smooth muscles that help move urine from the kidneys to the bladder.

Iris of eye: Contains smooth muscles that control the size of the pupil.

Bronchi of lungs: Have smooth muscles that regulate airflow in the respiratory system.

Biceps: Composed of skeletal muscles, which are responsible for voluntary movements.

Q. Which one of the following cell organelles is known as ‘suicide bags’ of a cell ? [2019-II]

(a) Lysosomes

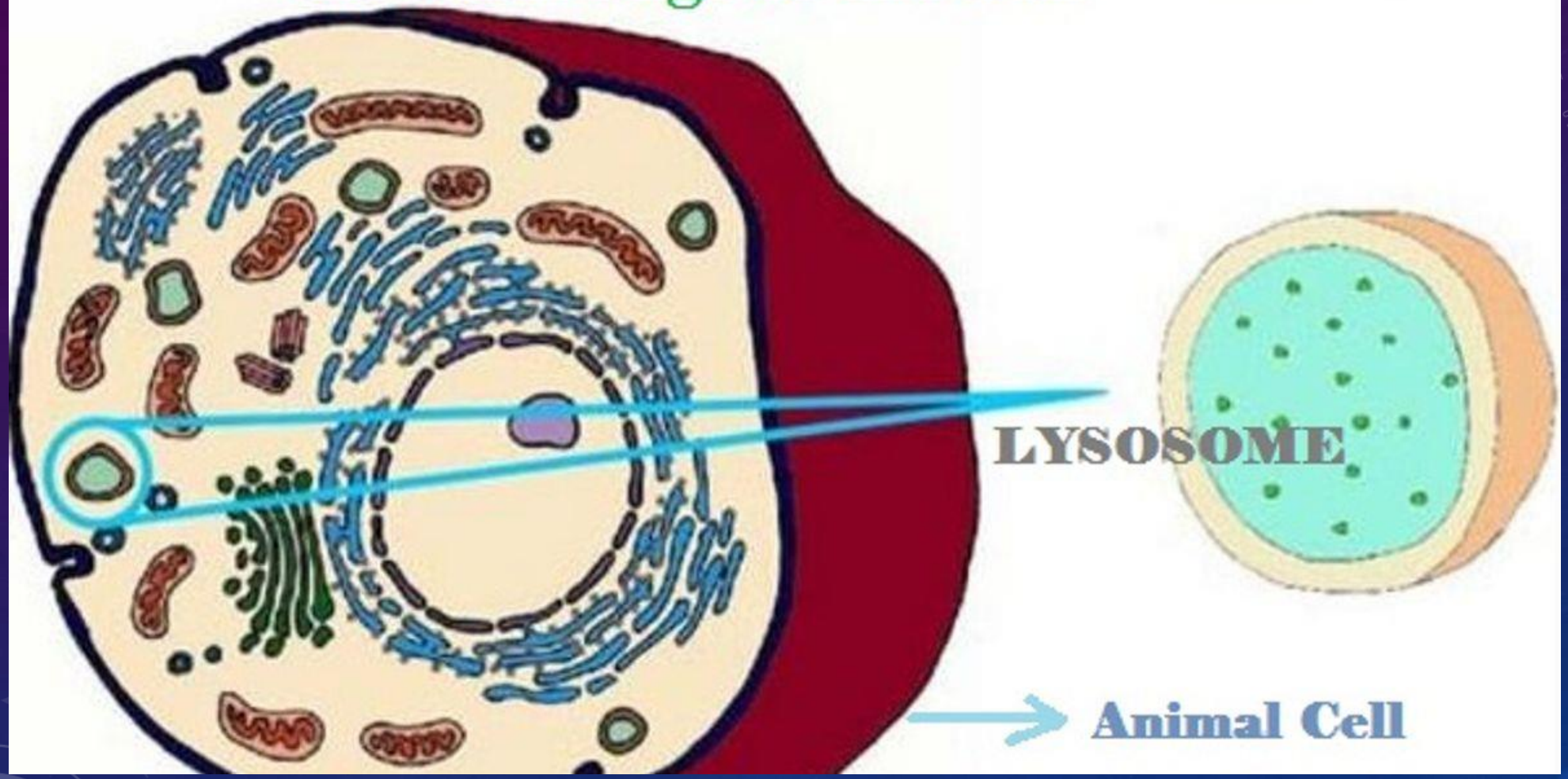
(b) Plastids

(c) Endoplasmic reticulum

(d) Mitochondria

Why are Lysosomes called

Suicidal bags of the cell



Answer (a)

Lysosomes are found in animal cell, they are also known as **suicidal bags of the cell**. A human cell contains around 300 lysosomes. They not only digest large molecules but also responsible for breaking down and getting rid of waste products of the cell. They have enzymes which allow them to carry out these processes.

Plastids: Involved in photosynthesis and pigment storage; not related to cell death.

Endoplasmic reticulum: Functions in protein and lipid synthesis; not related to cell death.

Mitochondria: Powerhouse of the cell, involved in energy production; not referred to as 'suicide bags.'

Q. Food chain is **[2019-II]**

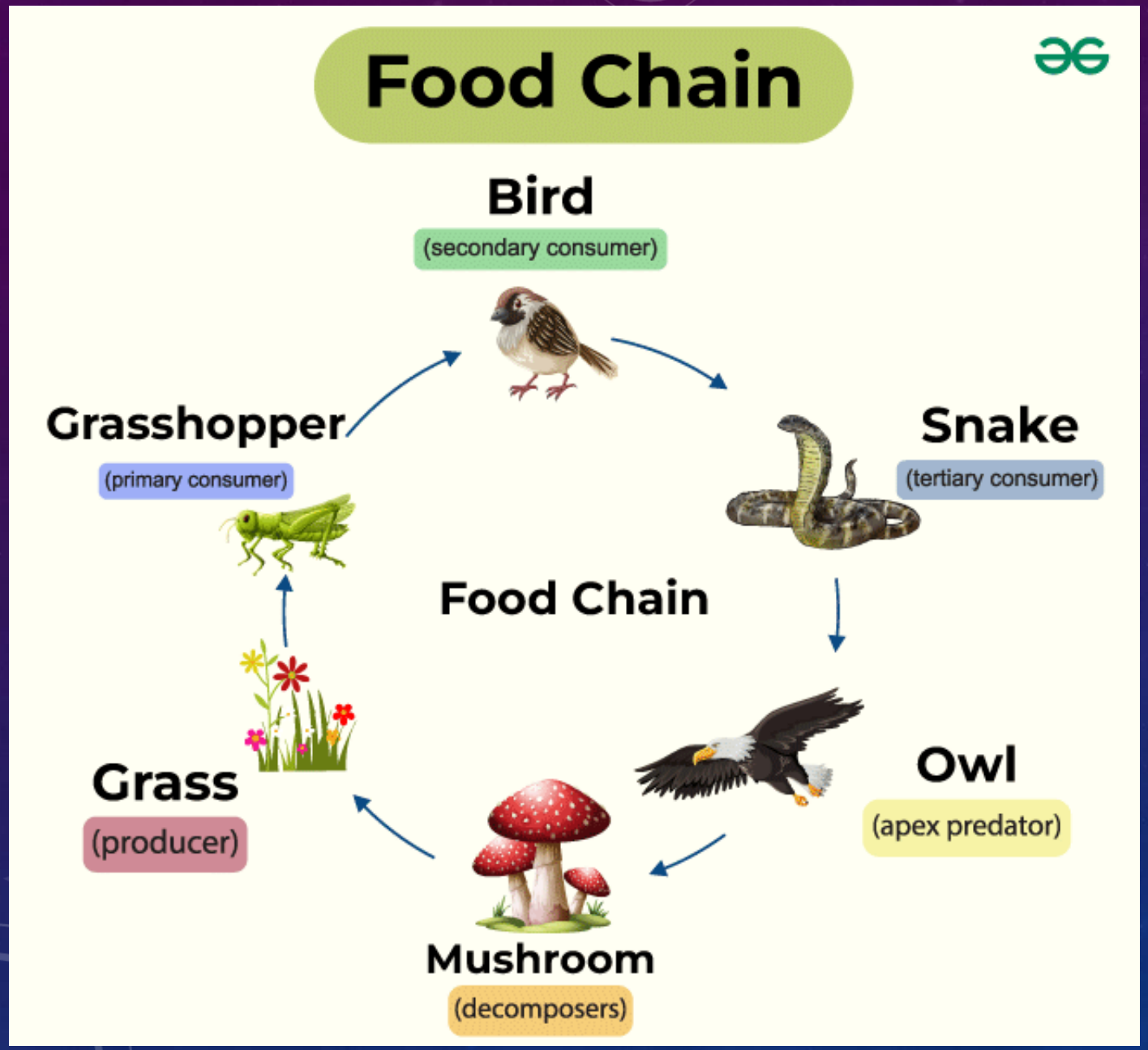
(a) Relationship between autotrophic organisms

(b) Exchange of genetic material between two organisms

(c) Passage of food (and thus energy) from one organism to another

(d) Modern entrepreneur establishment providing food outlets

Food Chain



Answer (c)

Relationship between autotrophic organisms: Incorrect; this describes interactions within a group of organisms that produce their own food, but not the flow of energy.

Exchange of genetic material between two organisms: Incorrect; this describes genetic recombination or reproduction, not a food chain.

Passage of food (and thus energy) from one organism to another: Correct; a food chain illustrates how energy and nutrients are transferred from producers to consumers through different trophic levels.

Modern entrepreneur establishment providing food outlets: Incorrect; this refers to business establishments, not ecological processes.

- A food chain shows how each living thing gets food and how nutrients and energy are passed from creature to creature.
- Food chains begin with plant-life and end with animal-life.
- Some animals eat plants, some animals eat other animals.
- A simple food chain could start with grass, which is eaten by rabbits.

Q. Which one of the following is active transport ? [2019-II]

(a) It is the movement of a substance against a diffusion gradient with the use of energy from respiration.

(b) It is the movement of a substance against a diffusion gradient without the use of energy.

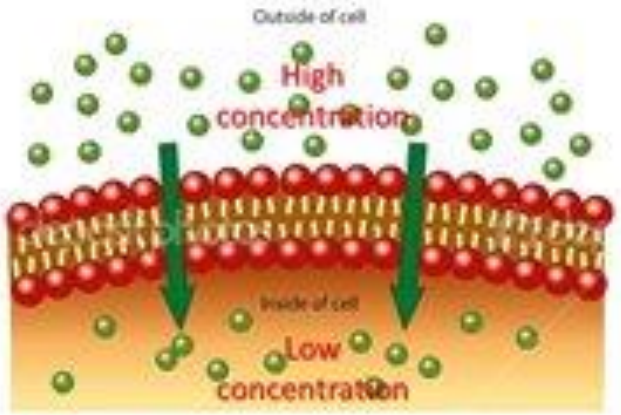
(c) It is the movement of a substance against a diffusion gradient with the use of energy from photosynthesis,

(d) It is the movement of a substance along a diffusion gradient with the use of energy from respiration.

- **Answer (A)**

- Active transport is a cellular process that moves substances against their concentration gradient, requiring energy, typically derived from ATP hydrolysis or cellular respiration.
- Option 'A' correctly describes this process, emphasizing the need for energy from respiration.
- In contrast, options 'B' and 'D' are incorrect because they either misrepresent the direction of transport (along the gradient) or the need for energy.
- Option 'C' is also incorrect as it mistakenly attributes the energy source to photosynthesis, which is not directly involved in active transport.

Passive transport

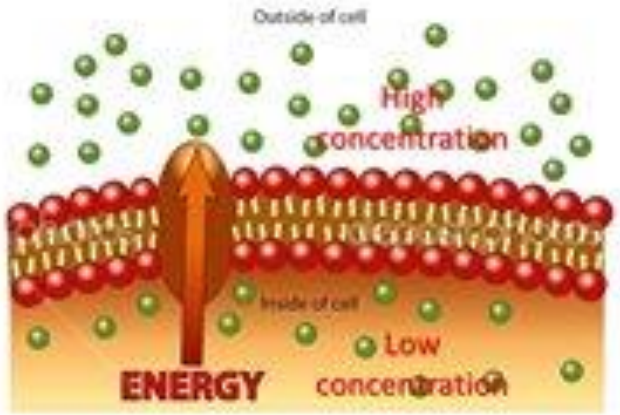


Requires no energy

Molecules flow across the membrane by diffusion

No ATP required

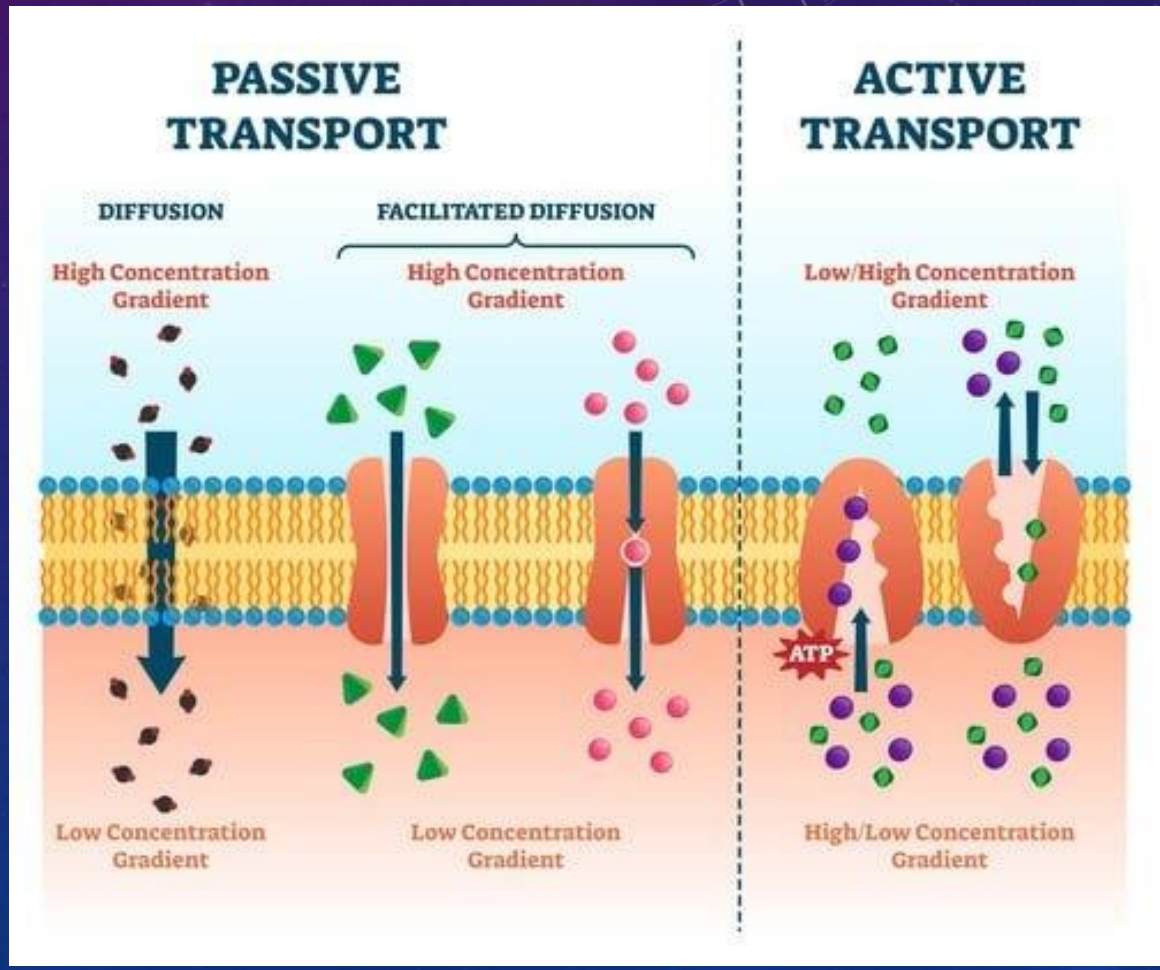
Active transport



Requires energy

Molecules are pumped across the membrane

ATP required



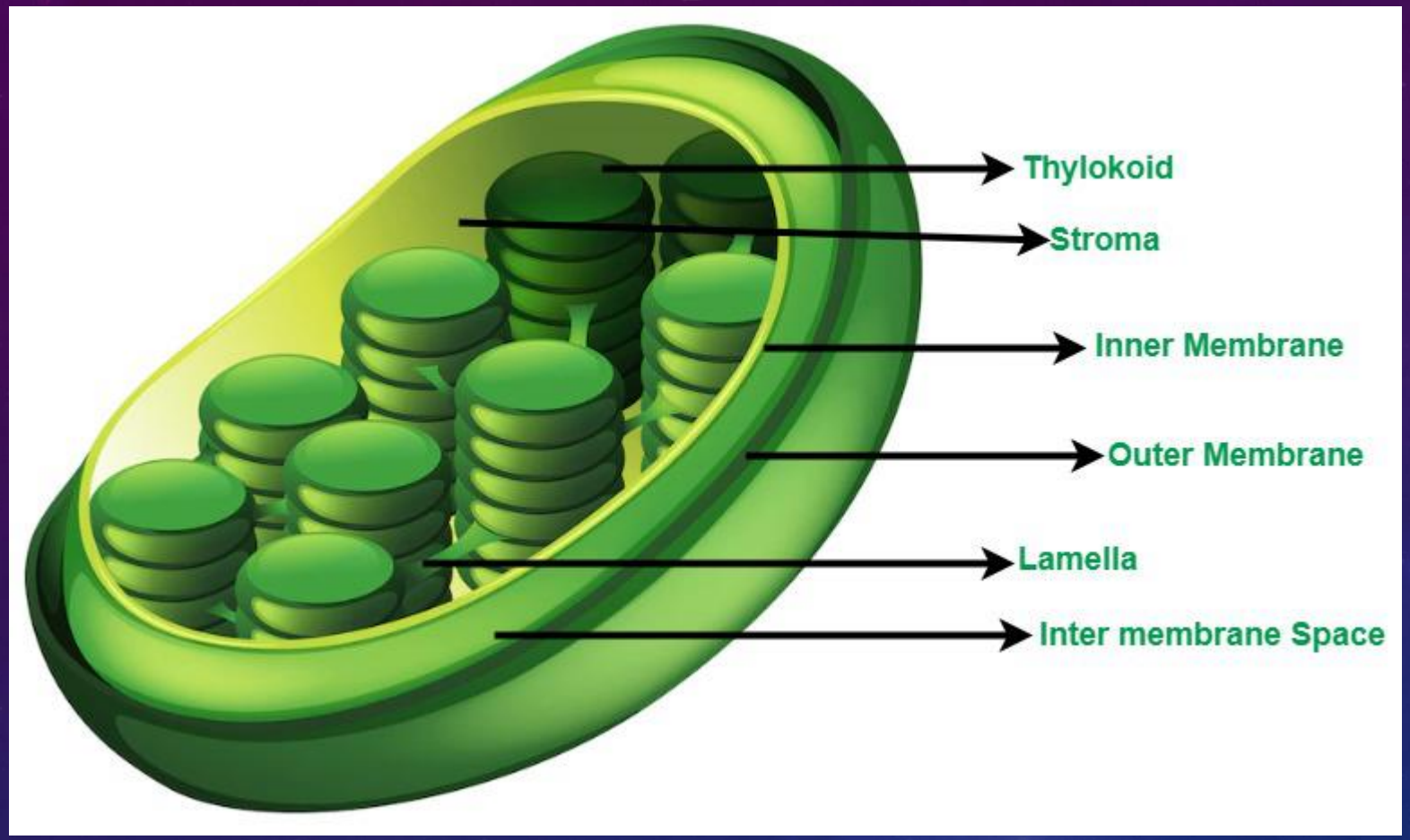
Q. Chlorophyll in photosynthetic prokaryotic bacteria is associated with [2019-II]

(a) plastids

(b) membranous vesicles

(c) nucleoids

(d) chromosomes



Answer (b)

The chlorophyll in photosynthetic prokaryotic bacteria is associated with membranous vesicles.

These vesicles are typically spherical, ranging in size from 20 to 100 nm in Gram-positive bacteria and archaea to 100–300 nm in Gram-negative bacteria. They can contain cell-wall material, as well as a

variable content enclosed by the membrane.

(a) **Plastids**: Found in eukaryotic cells, not prokaryotic.

(b) **Membranous vesicles**: In prokaryotic photosynthetic bacteria (like cyanobacteria), chlorophyll is located in these structures within the cell membrane.

(c) **Nucleoids**: Contain the DNA of prokaryotes but not where chlorophyll is located.

(d) **Chromosomes**: Contain genetic material but are not associated with chlorophyll.

Eukaryotic Cells:

•**Structure**: Have a defined nucleus enclosed by a nuclear membrane and contain membrane-bound organelles (e.g., mitochondria, endoplasmic reticulum).

•**Examples**: Found in plants, animals, fungi, and protists.

Prokaryotic Cells:

•**Structure**: Lack a defined nucleus and membrane-bound organelles; DNA is free-floating in the cell's cytoplasm.

•**Examples**: Found in bacteria and archaea.

CDS 2020 (1) PYQs

Biology

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Which one of the following is not an epidemic disease ? [2020-I]

(a) Cholera

(b) Malaria

(c) Smallpox

(d) Elephantiasis

Answer (d)

(d) Elephantiasis is also known as **lymphatic filariasis**. It's caused by **parasitic worms**, and can spread from person to person **through mosquitoes**. Elephantiasis causes swelling of the scrotum, legs, or breasts. Elephantiasis is considered a neglected tropical disease (NTD)

(a) **Cholera**, Correct: Cholera is an epidemic disease. It spreads rapidly, often through contaminated water, affecting large populations.

(b) **Malaria**, Correct: Malaria is also an epidemic disease. It spreads through mosquitoes and can affect large numbers of people in a region.

(c) **Smallpox**, Correct: Smallpox was an epidemic disease before it was eradicated. It spread rapidly and affected many people.

What's the difference between an endemic, epidemic and pandemic disease?

Endemic disease

Constantly present in a population or region, with relatively low spread

Epidemic disease

Sudden increase in cases spreading through a large population

Pandemic disease

Sudden increase in cases across several countries, continents or the world

Q. Which one of the following animals has a three- chambered heart? [2020-I]

(a) Scoliodon

(b) Salamander

(c) Pigeon

(d) Human being

Answer (b) Salamander belongs to group Amphibia, which shows **3 chambered heart** (**two auricles and one ventricle**). In the 3 chambered heart, **partial mixing of blood takes place**. All amphibians have three chambered heart.

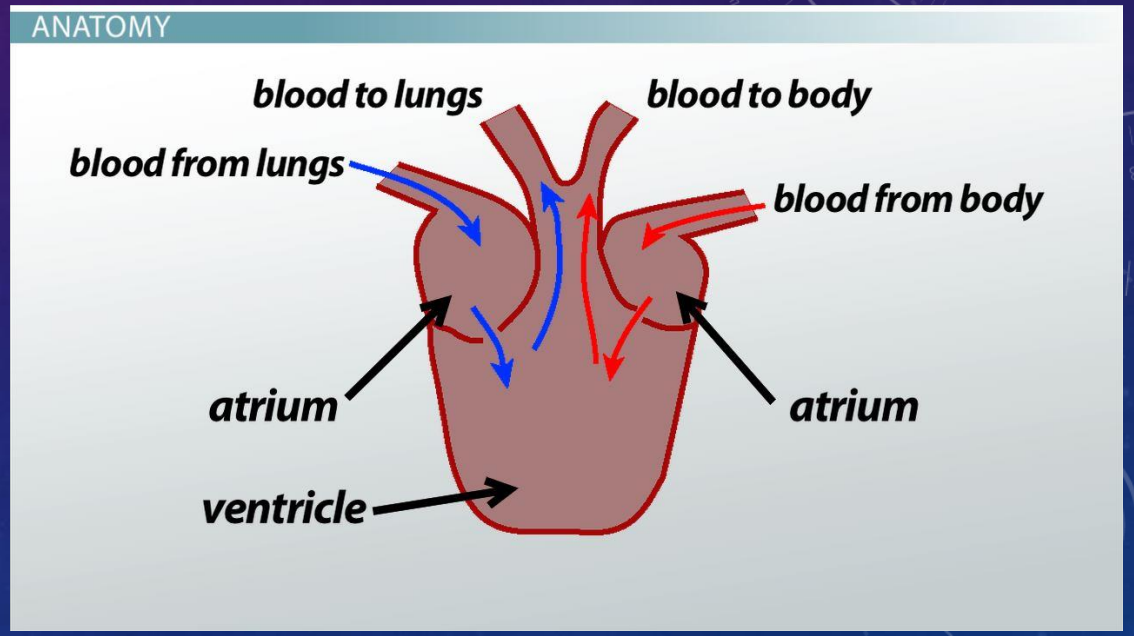
(a) **Scoliodon, Incorrect**: Scoliodon, a type of shark, has a two-chambered heart, typical of fish

(b) **Pigeon, Incorrect**: Pigeons, like other birds, have a four-chambered heart, similar to mammals.

(c) **Human being**, Incorrect: Humans also have a four-chambered heart, with two atria and two ventricles.

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

3 chambered heart



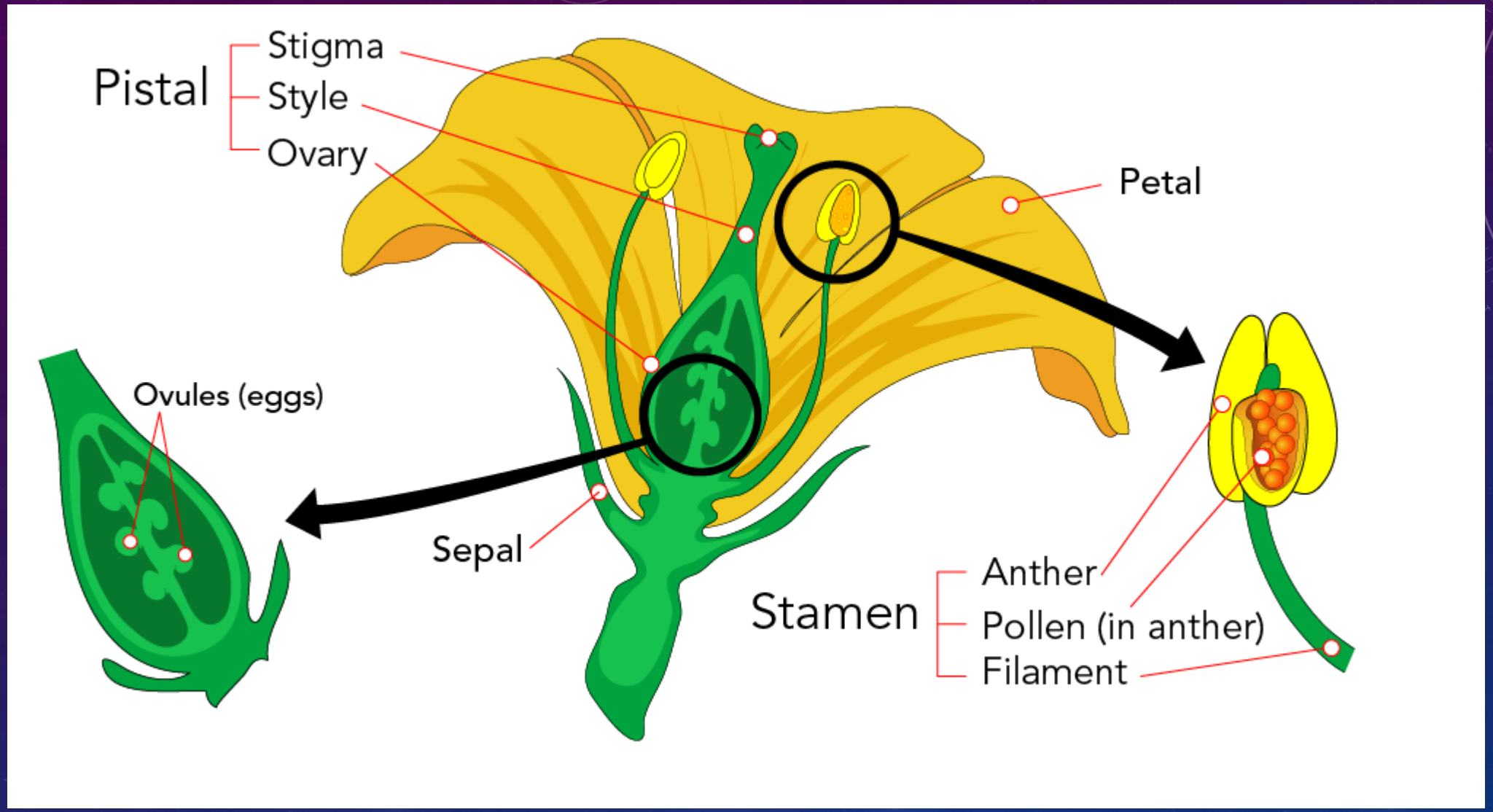
Q. Which one of the following is the correct sequence of events during sexual reproduction in plants ? [2020-I]

(a) Seedling, formation of embryo, pollination, fertilization, division of zygote

(b) Formation of embryo, seedling, pollination, fertilization, division of zygote

(c) Pollination, fertilization, division of zygote, formation of embryo, seedling

(d) Seedling, formation of embryo, division of zygote, pollination, fertilization



Answer (c)

Sequence of events of sexual reproduction in flowers are:

(1) Pollination- transfer of pollen to stigma.

(2) **Fertilization**- fusion of male gamete and egg cell produce zygote and fusion of polar nuclei with male gamete produce triploid endosperm.

(3) **Embryo formation**- zygote divides many time by mitosis and produces embryo.

(4) **Seedling**- embryo differentiate and becomes plumule, radicle and one or two cotyledons. Endosperm divides by mitosis to produce endosperm tissue which is food store. Integuments surrounding embryo sac forms testa (seed coat).

Q. Which one of the following is the 'energy currency' for cellular processes ? [2020-I]

(a) Glucose

(b) ATP

(c) ADP

(d) Pyruvic acid

Answer (b)

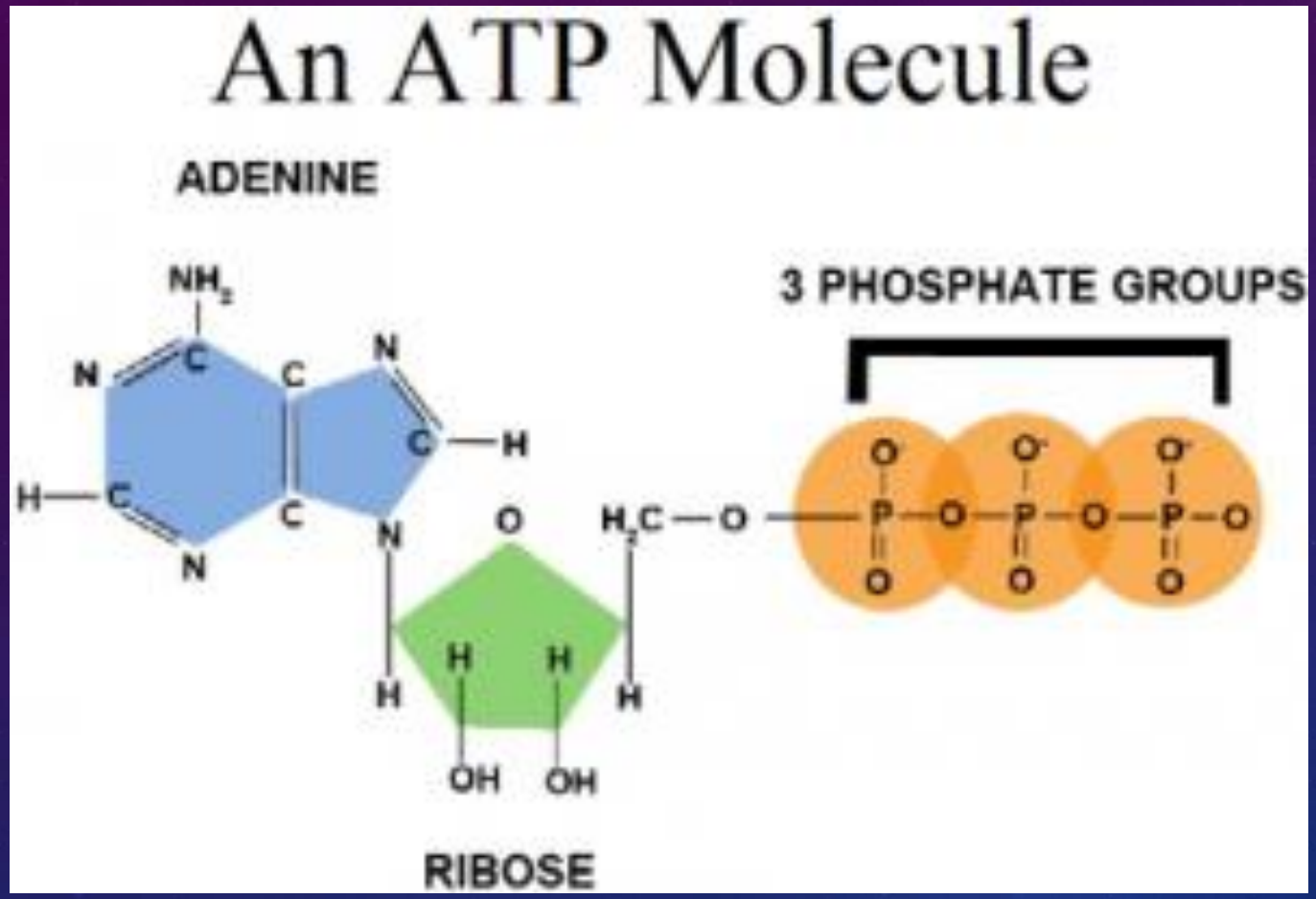
(a) **Glucose**, Incorrect: Glucose is a source of energy, but it's not the direct "currency." Cells break down glucose to produce energy, but it's not used directly by cellular processes.

(b) **ATP**, Correct: ATP (Adenosine Triphosphate) is known as the "energy currency" of the cell. It directly powers cellular processes by providing energy when its phosphate bonds are broken.

(c) **ADP**, Incorrect: ADP (Adenosine Diphosphate) is a lower-energy molecule formed when ATP loses a phosphate group. It’s not the primary energy currency but can be converted back to ATP.

(d) **Pyruvic acid**, Incorrect: Pyruvic acid is an intermediate product in the breakdown of glucose but is not used directly as an energy currency by cells.

An ATP Molecule



Q. Which one of the following is the first enzyme to mix with food in the digestive tract ? [2020-I]

(a) Trypsin

(b) Cellulose

(c) Pepsin

(d) Amylase

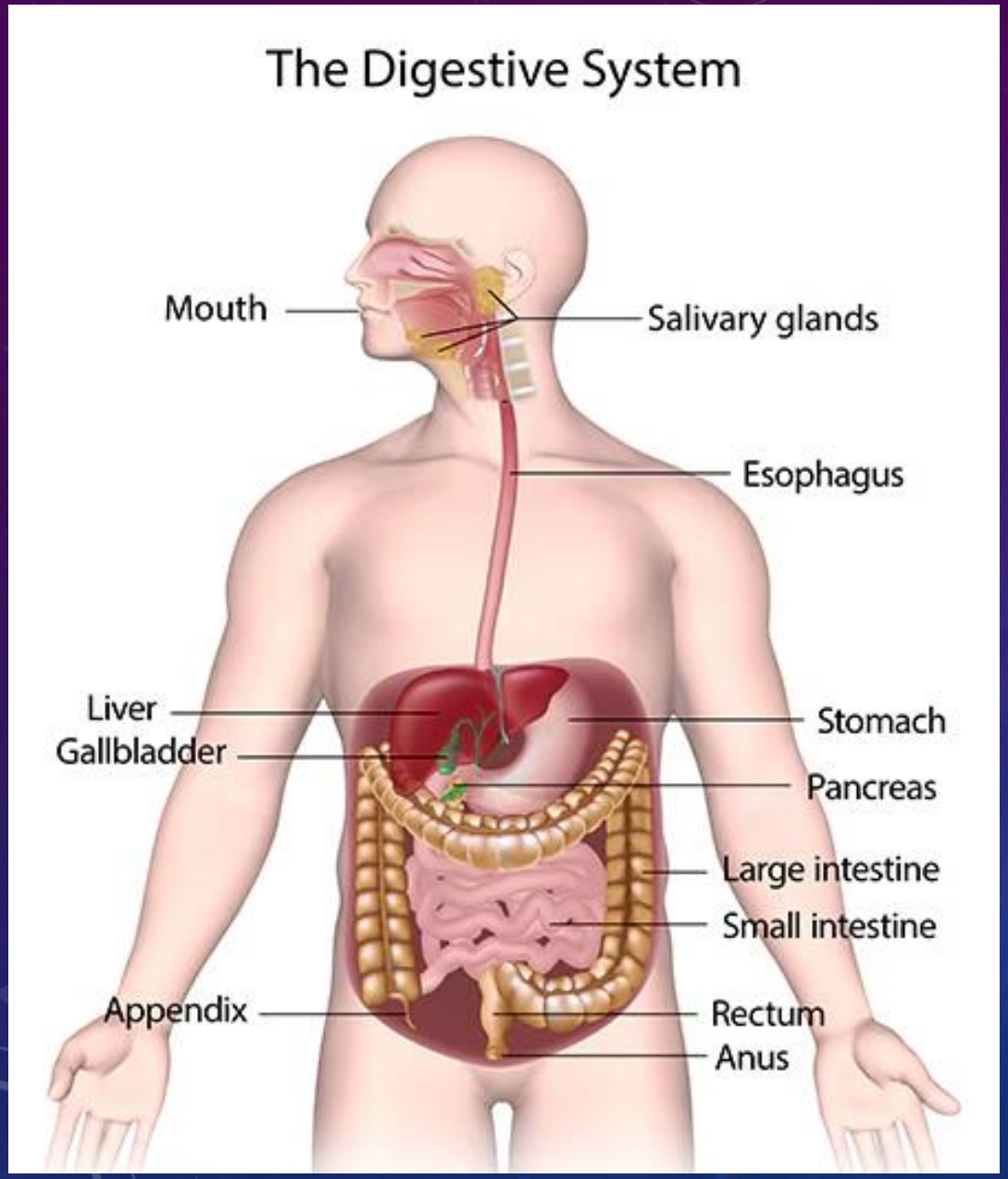
Answer (d)

(a) **Trypsin**, Incorrect: Trypsin is an enzyme that breaks down proteins in the small intestine, but it's not the first enzyme to act on food.

(b) **Cellulose**, Incorrect: Cellulose is not an enzyme; it's a carbohydrate found in plant cell walls. Human bodies don't produce an enzyme to digest cellulose, but certain microorganisms can break it down.

(c) **Pepsin**, Incorrect: Pepsin is an enzyme that digests proteins in the stomach, but it's not the first enzyme to interact with food.

(d) **Amylase**, Correct: Amylase is the first enzyme to mix with food, beginning the digestion of carbohydrates in the mouth. It's **produced in saliva.**



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SHAPING CAREERS WITH DEVOTION

Q. Match List-I with List-II and select the correct answer using the code given below the Lists : [2020 - I]

List-I (Name)	List - II(Formula)
A. Bleaching powder	1. $NaHCO_3$
B. Baking soda	2. Na_2CO_3
C. Washing soda	3. $Ca(OH)_2$
D. Slaked lime	4. $CaOCl_2$

Codes:

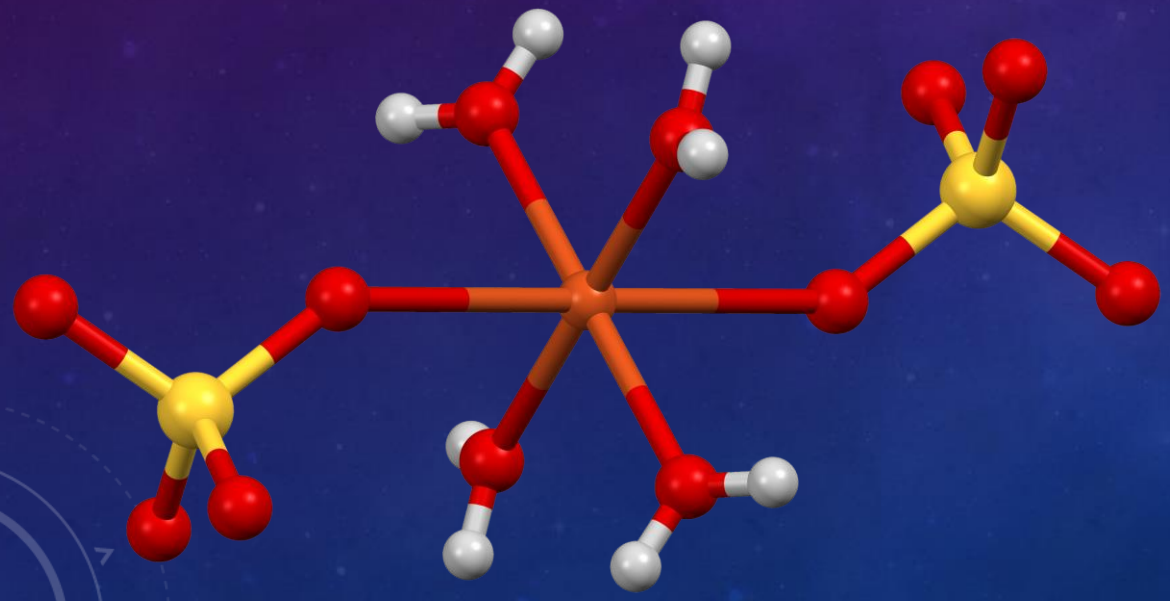
	A	B	C	D
(a)	4	1	2	3
(b)	4	2	1	3
(c)	3	2	1	4
(d)	3	1	2	4

Answer (a)

Q. The number of water molecules associated with copper sulphate molecule to form crystals is [2020- I]

(a) 2
(b) 4
(c) 5
(d) 6

- **Answer (c)**
- The copper sulphate crystals contains 5 molecules of water of crystallization. $C_uSO_4 \cdot 5H_2O$ which are blue in colour.
- This means that each copper sulfate molecule is associated with 5 water molecules in its crystalline form.



Q. Which one of the following is the correct sequence of organs that occur in the path of urine flow in human body ? [2020- I]

(a) Kidney, ureter, urinary bladder, urethra

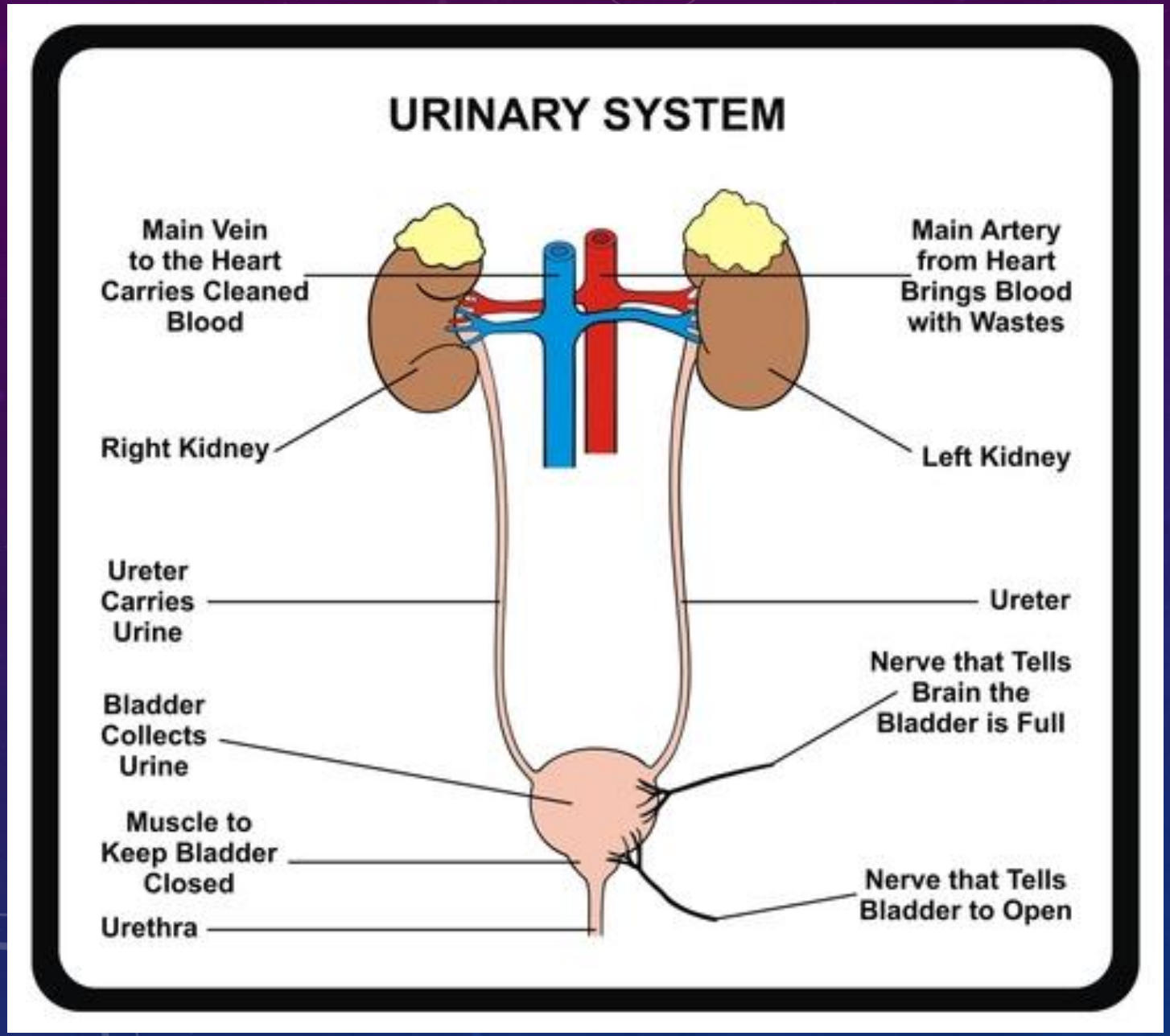
(b) Kidney, urinary bladder, ureter, urethra

(c) Kidney, ureter, urethra, urinary bladder

(d) Urinary bladder, kidney, urethra, ureter

Answer: (a)

- Kidneys filter blood to produce urine.Urine flows from the kidneys through the ureters.
- The urinary bladder stores urine until it’s ready to be expelled.
- Urine is then released from the body through the urethra.
- (a) Kidney, ureter, urinary bladder, urethra, Correct: This sequence accurately describes the path of urine from production in the kidneys, through the ureters, stored in the bladder, and finally expelled via the urethra.



Q. Which of the following endocrine glands is not found in pair in humans ? [2020-I]

(a) Adrenal

(b) Pituitary

(c) Testis

(d) Ovary

Answer (b)

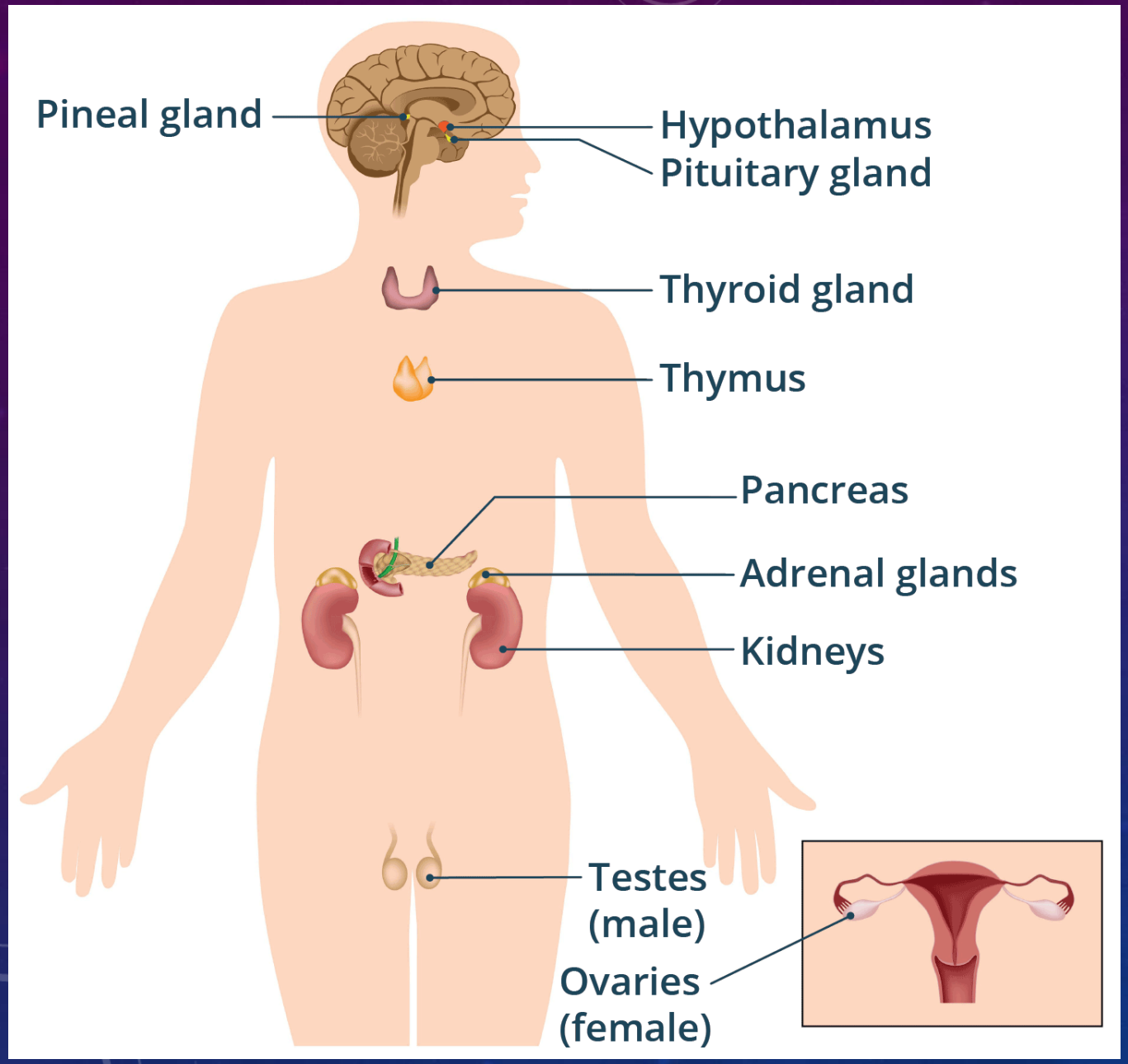
(a) **Adrenal**, Incorrect: Adrenal glands are found in pairs, with one located on top of each kidney.

(b) **Pituitary**, Correct: The pituitary gland is not found in pairs. There is only one pituitary gland, located at the base of the brain.

(c) **Testis**, Incorrect: The testes are found in pairs in males.

(d) **Ovary**, Incorrect: The ovaries are found in pairs in females.

Answer: (b) Pituitary is the correct choice because it is the only endocrine gland listed that is not found in pairs in humans.



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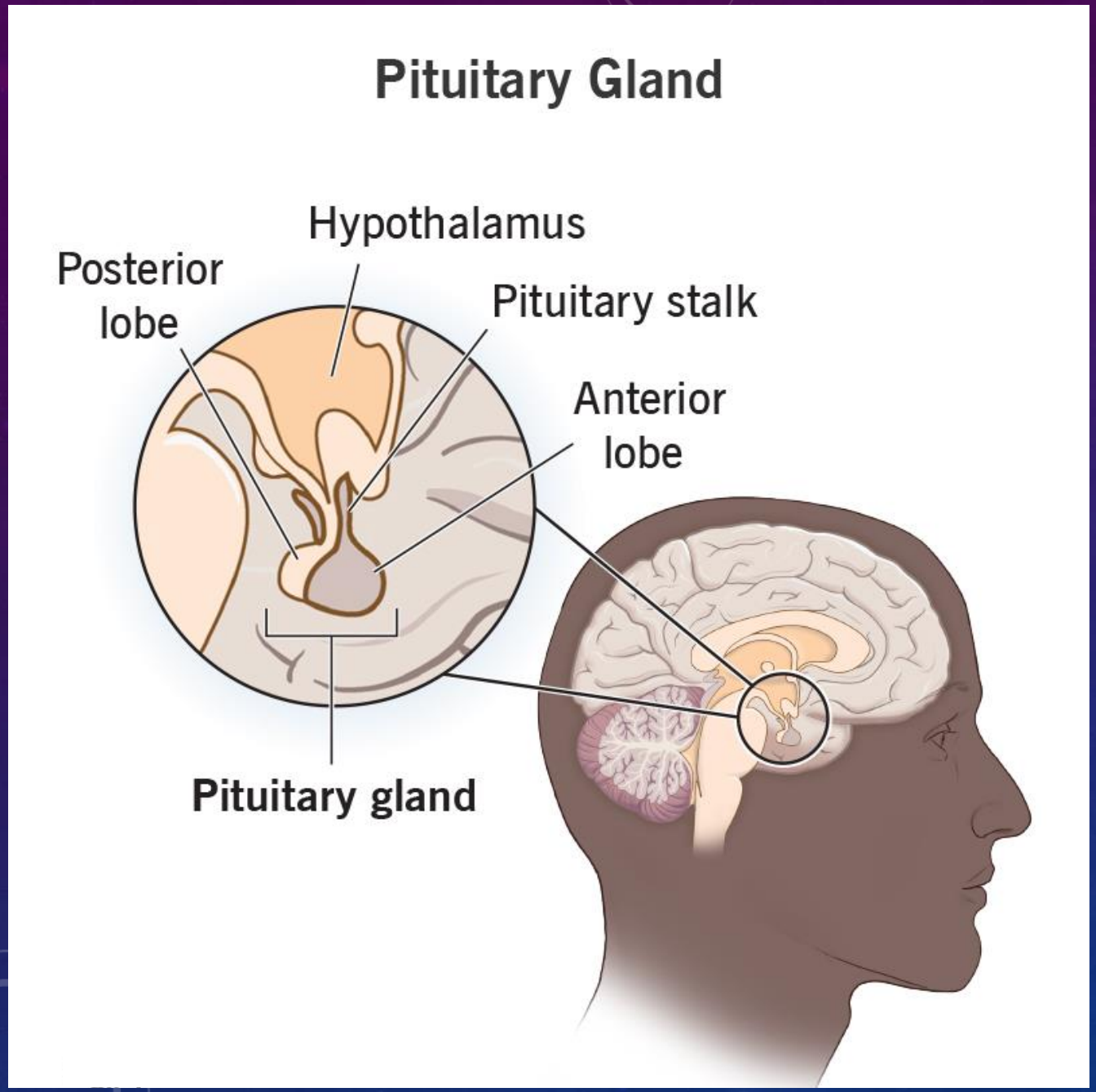


Q. Which one of the following cell organelles contains DNA ? [2020-I]

(a) Golgi apparatus

(b) Mitochondrion

(c) Lysosome

(d) Endoplasmic reticulum

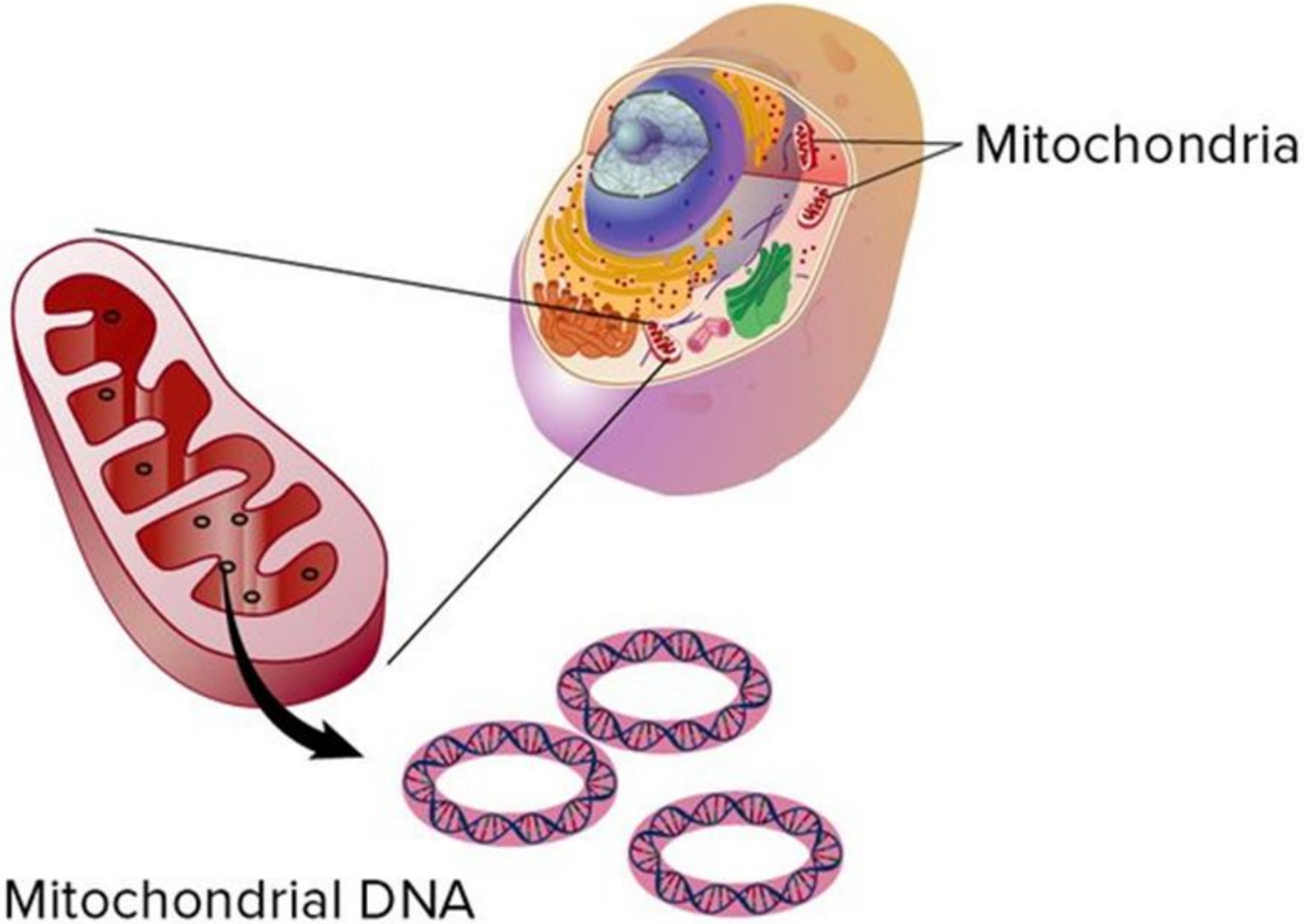
Answer (b)

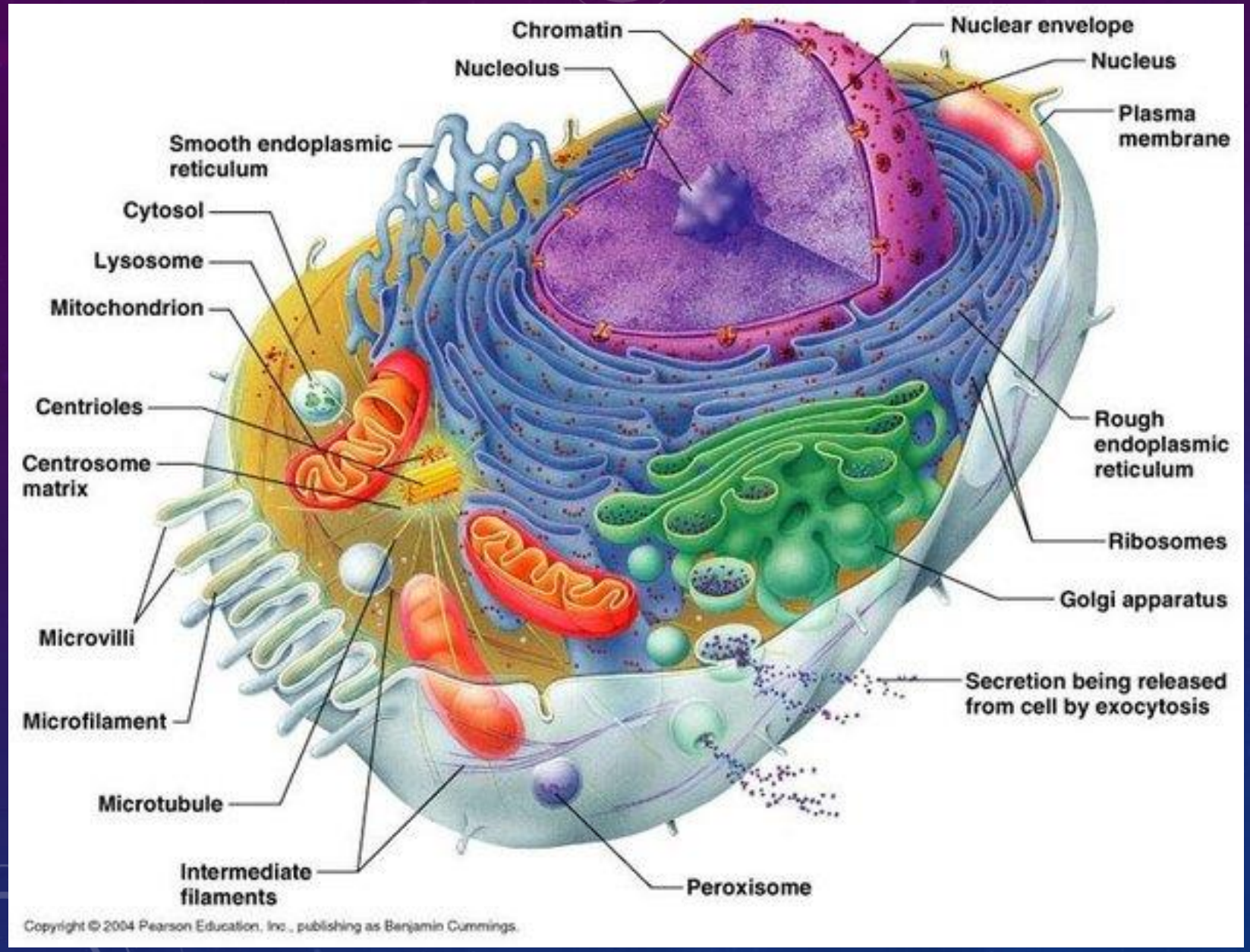
(a) **Golgi apparatus**, Incorrect: The Golgi apparatus does not contain DNA. It is involved in modifying, sorting, and packaging proteins and lipids.

(b) **Mitochondrion**, Correct: Mitochondria contain their own DNA (mtDNA). This DNA is involved in encoding some of the proteins needed for mitochondrial function.

(c) **Lysosome**, Incorrect: Lysosomes do not contain DNA. They are responsible for breaking down waste materials and cellular debris.

(d) **Endoplasmic reticulum**, Incorrect: The endoplasmic reticulum does not contain DNA. It is involved in protein and lipid synthesis.





Q. Who among the following scientists introduced the concept of immunization to the medical world? [2020-I]

(a) Edward Jenner
(b) Robert Koch
(c) Robert Hooke
(d) Carl Linnaeus

Answer (a)

(a) **Edward Jenner**, Correct: Edward Jenner is known for introducing the concept of immunization. He developed the smallpox vaccine, which was the first successful vaccine and laid the foundation for immunization practices.

(b) **Robert Koch**, Incorrect: Robert Koch is famous for his work in microbiology and for establishing the germ theory of disease, but he did not introduce the concept of immunization.

(c) **Robert Hooke**, Incorrect: Robert Hooke is known for his work in microscopy and for coining the term "cell," but he did not introduce immunization.

(d) **Carl Linnaeus**, Incorrect: Carl Linnaeus is known for developing the system of binomial nomenclature for naming organisms, not for immunization.

CDS 2020 (2) PYQs

Biology

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Under the Kingdom Plantae, which following individuals are of the predominantly aquatic?

(a) Bryophytes
(b) Algae
(c) Pteridophyta
(d) Gymnosperms

Ans B

(a) **Bryophytes**: These are non-vascular plants like mosses and liverworts, and they typically need a moist environment but are not exclusively aquatic.
(b) **Algae**: These are primarily aquatic and can live in a variety of water environments, including freshwater and marine habitats.
(c) **Pteridophyta**: This group includes ferns and horsetails. They are often found in moist environments but are not exclusively aquatic.
(d) **Gymnosperms**: These are seed-producing plants like conifers (e.g., pine trees). They are mainly terrestrial and not predominantly aquatic.

Algae

Bryophytes

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SHAPING CAREERS WITH DEVOTION

Pteridophyta

Gymnosperm

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Q. All the individuals of a particular organism, such as rose plants, belong to a taxonomic category called

(a) species
(b) genus
(c) family
(d) order

•**Species**: The most specific classification, a group of individuals that can interbreed and produce fertile offspring (e.g., *Homo sapiens*—humans).
•**Genus**: A group of closely related species that share common characteristics (e.g., *Pan*—includes chimpanzees and bonobos).
•**Family**: A higher taxonomic rank grouping together several genera with similar traits (e.g., *Felidae*—the cat family, including lions, tigers, and domestic cats).
•**Order**: A classification above family, grouping together families that share broader characteristics (e.g., *Carnivora*—an order that includes families like *Felidae* (cats) and *Canidae* (dogs)).

Ans A

(a) **Species**: This is the taxonomic category where all individuals of a particular organism belong. For example, all rose plants are part of the species Rosa.

(b) **Genus**: This is a broader category that includes one or more species. For example, the genus Rosa includes various species of roses.

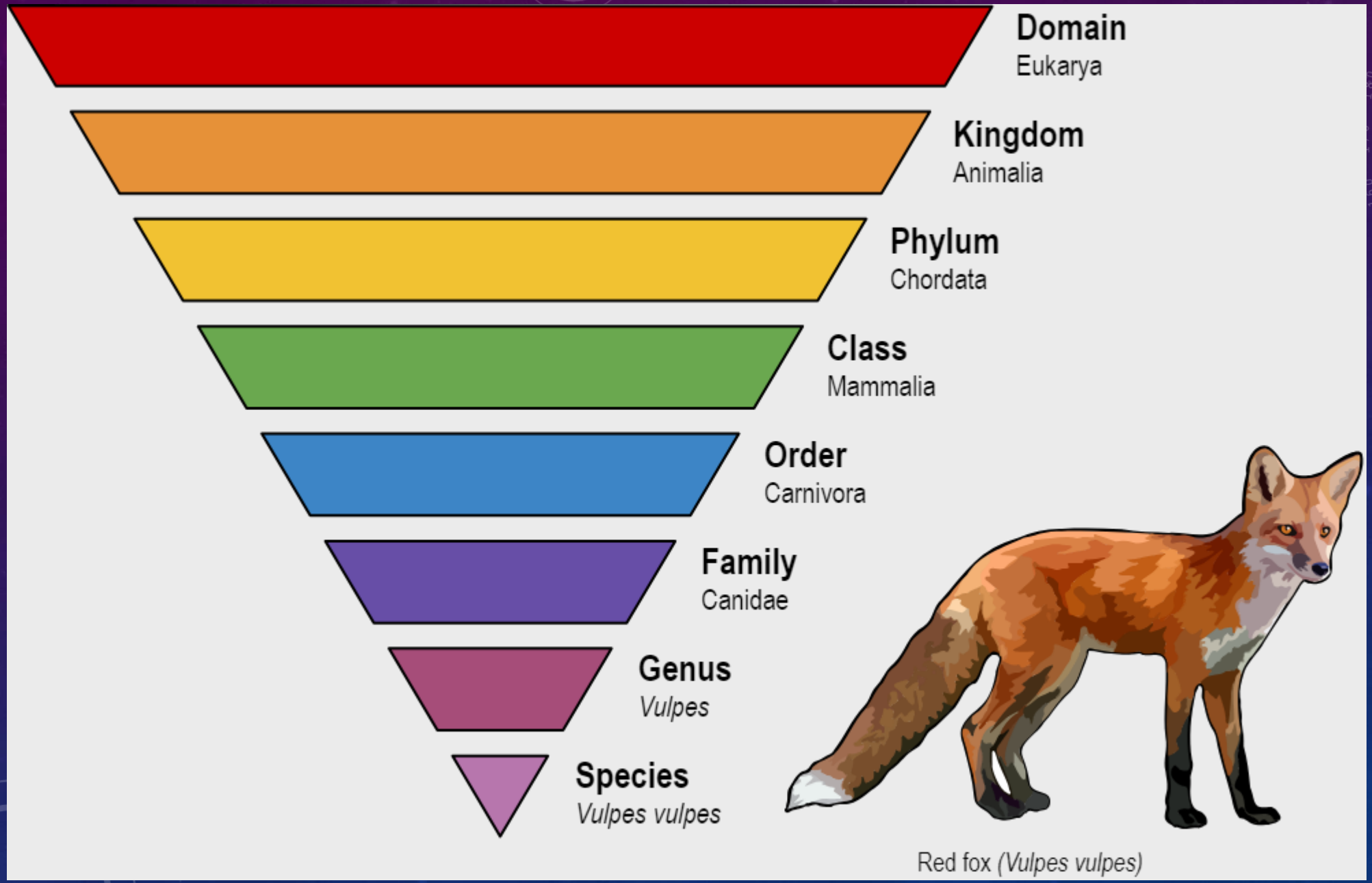
(c) **Family**: This is an even broader category that includes multiple genera. For instance, the family Rosaceae includes the genus Rosa among others.

(d) **Order**: This is a higher taxonomic rank that includes multiple families. For example, the order Rosales includes the family Rosaceae.

Taxonomy is the science of classification. It involves organizing and categorizing organisms into hierarchical groups based on their shared characteristics and evolutionary relationships. The main levels of classification in taxonomy, from broadest to most specific, are:

Domain: The highest level, including Bacteria, Archaea, and Eukarya.
Kingdom: Groups within domains, such as Animals, Plants, and Fungi.
Phylum: Groups within kingdoms, like Chordata (which includes animals with backbones).
Class: Further subdivisions within phyla, like Mammalia (mammals).
Order: Categories within classes, such as Carnivora (carnivores).
Family: Groups within orders, like Canidae (dogs and their relatives).
Genus: Groups within families, such as Canis (wolves and dogs).
Species: The most specific level, referring to individual organisms that can interbreed, like Canis lupus (the gray wolf).

Taxonomy helps scientists communicate about organisms, understand biodiversity, and study evolutionary relationships.



Q. Pearls are harvested from

(a) Prawn
(b) Pila
(c) Tuna
(d) Oyster

Ans D

(a) **Prawn**: Prawns are crustaceans and do not produce pearls.
(b) **Pila**: Pila is a genus of freshwater snails, which also do not produce pearls.
(c) **Tuna**: Tuna are fish and do not produce pearls.
(d) **Oyster**: Oysters are mollusks that produce pearls as a natural defense mechanism against irritants.

Oyster

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SHAPING CAREERS WITH DEVOTION

Prawn

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Pila

Tuna

Q. Wings of birds and bats are considered analogous structures because they have

(a) common origin and common function
(b) different origin and common function
(c) common origin and different function
(d) different origin and different function

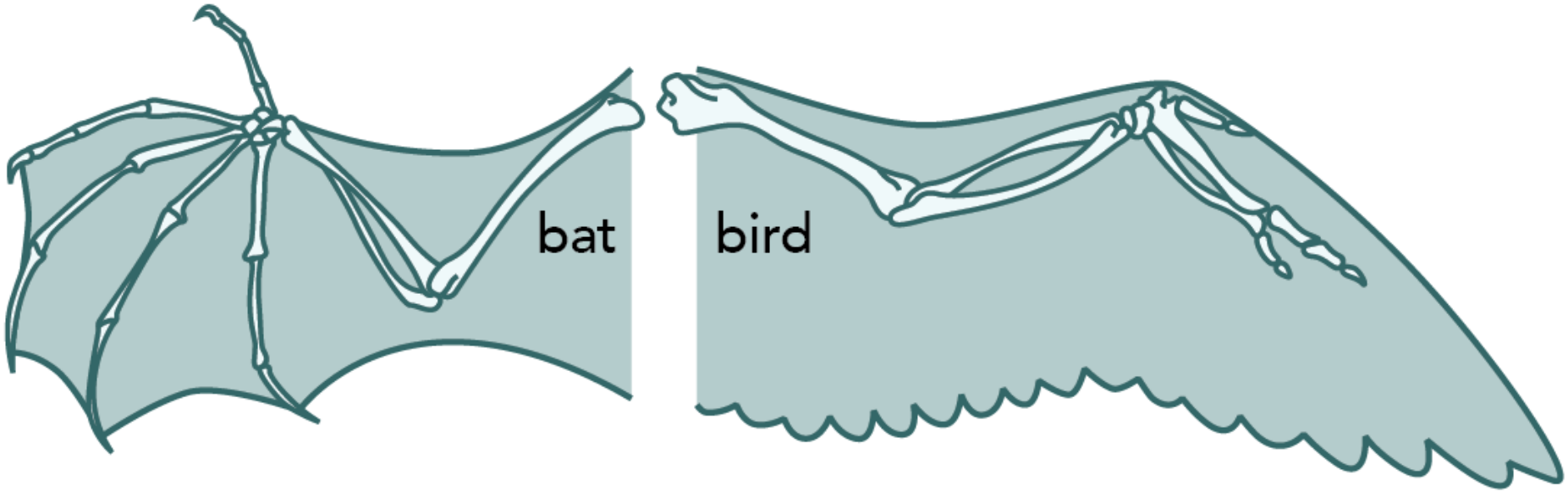
Ans B

a) **Common origin and common function**: This would describe homologous structures, which share a common evolutionary origin. The wings of birds and bats do not share a common origin.

b) **Different origin and common function**: This describes analogous structures, which have different evolutionary origins but perform similar functions. Bird wings and bat wings evolved independently but both serve the function of flight.

c) **Common origin and different function**: This describes homologous structures with different functions. For example, the forelimbs of humans and birds are homologous but have different functions.

d) **Different origin and different function**: This would indicate structures that are both functionally and evolutionarily unrelated, which is not the case for bird and bat wings.



Q. Apart from hyper acid secretion, peptic ulcers are also developed due to bacterial infection. The causative agent is

(a) Helicobacter pylori
(b) E. coli
(c) Streptococcus pneumoniae
(d) Salmonella typhimurium

Ans A

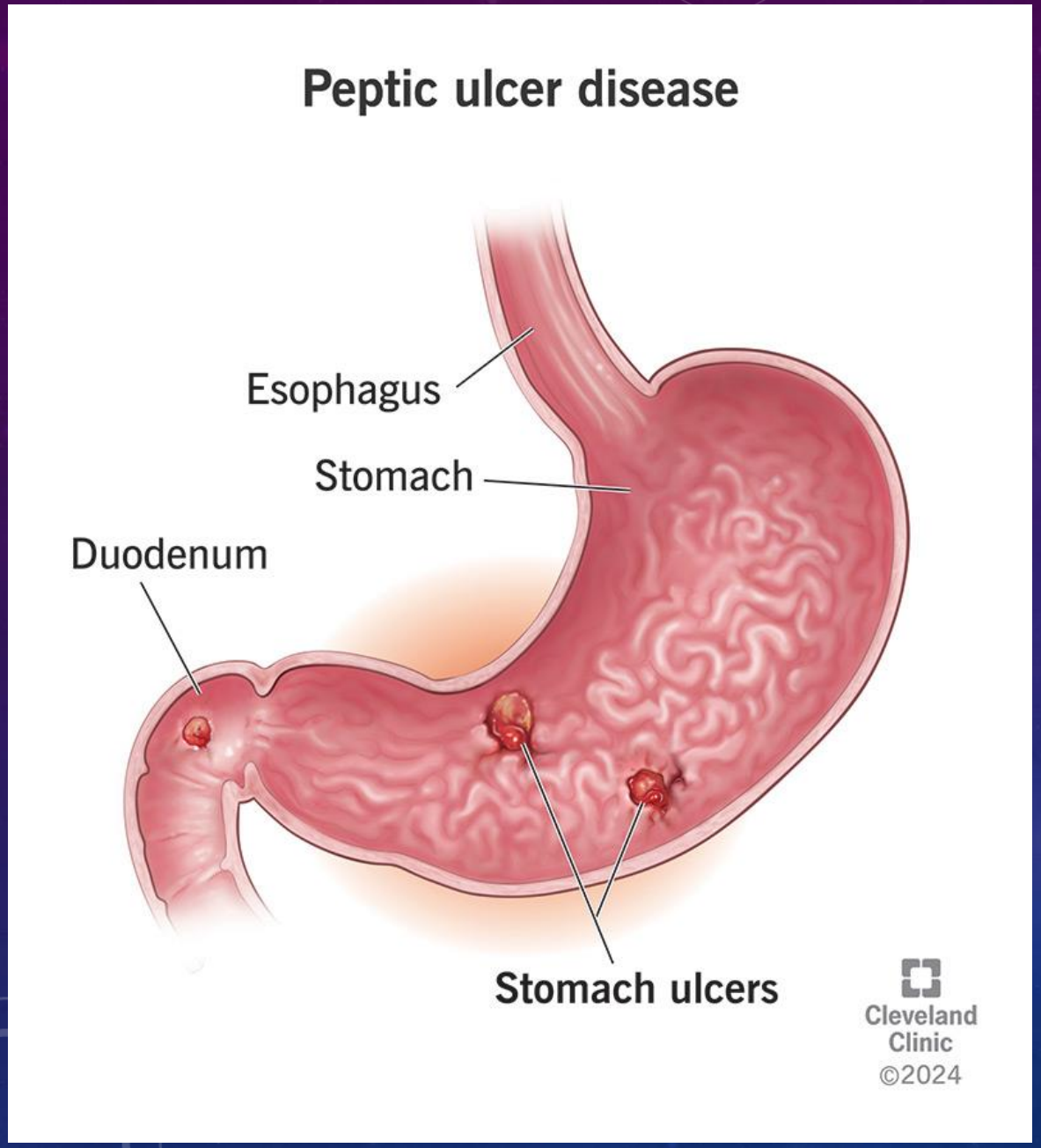
(a) **Helicobacter pylori**: This bacterium is known to cause peptic ulcers by infecting the stomach lining and is a major contributor to ulcer development.

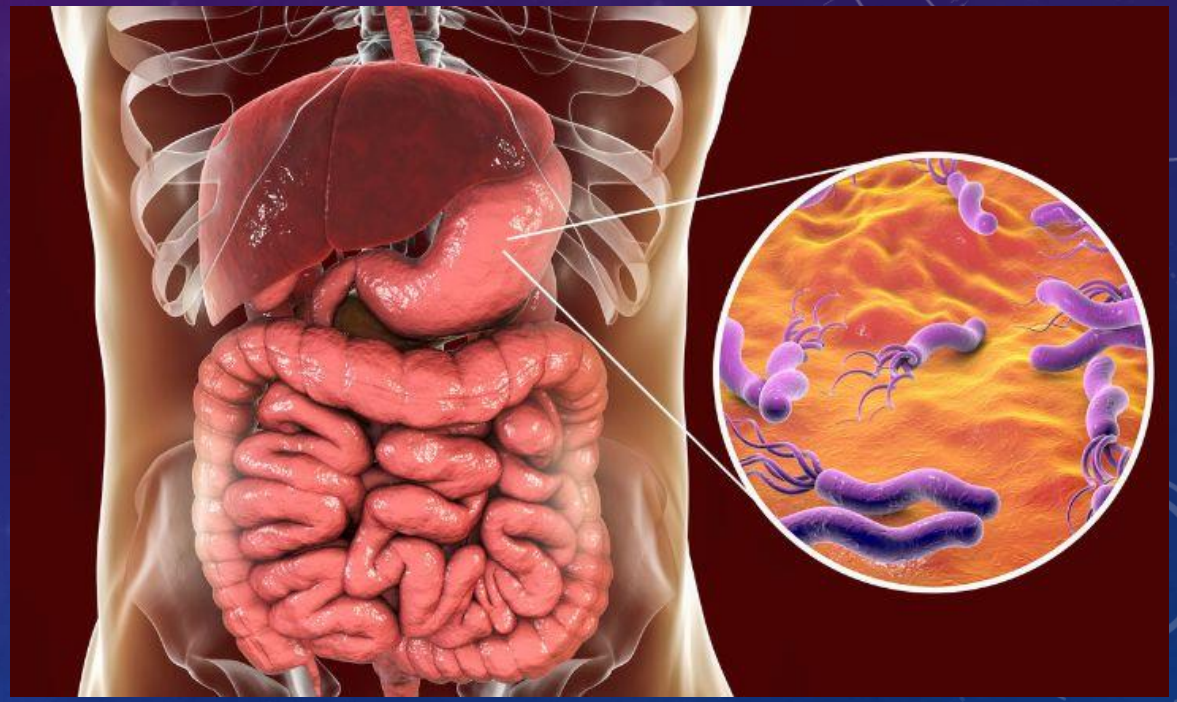
(b) **E. coli**: This bacterium is typically associated with gastrointestinal infections, but not specifically with peptic ulcers.

(c) **Streptococcus pneumoniae**: This bacterium causes pneumonia and other respiratory infections, not peptic ulcers.

(d) **Salmonella typhimurium**: This bacterium is known for causing foodborne illnesses and typhoid fever, but not peptic ulcers.

- **A peptic ulcer** is a sore that develops on the lining of the stomach, small intestine, or esophagus, primarily due to Helicobacter pylori infection or prolonged use of NSAIDs. It can cause symptoms like burning abdominal pain, nausea, bloating, and in severe cases, black stools or vomiting blood.
- Diagnosis typically involves endoscopy or tests for H. pylori, and treatment includes medications to reduce stomach acid, antibiotics if an infection is present, and lifestyle changes such as avoiding NSAIDs, alcohol, and smoking.





Q. Which one of the following statements about phloem is correct?

(a) Phloem transports water and minerals.
(b) Phloem transports photosynthetic products.
(c) Phloem is a simple tissue.
(d) Phloem gives support to the plant.

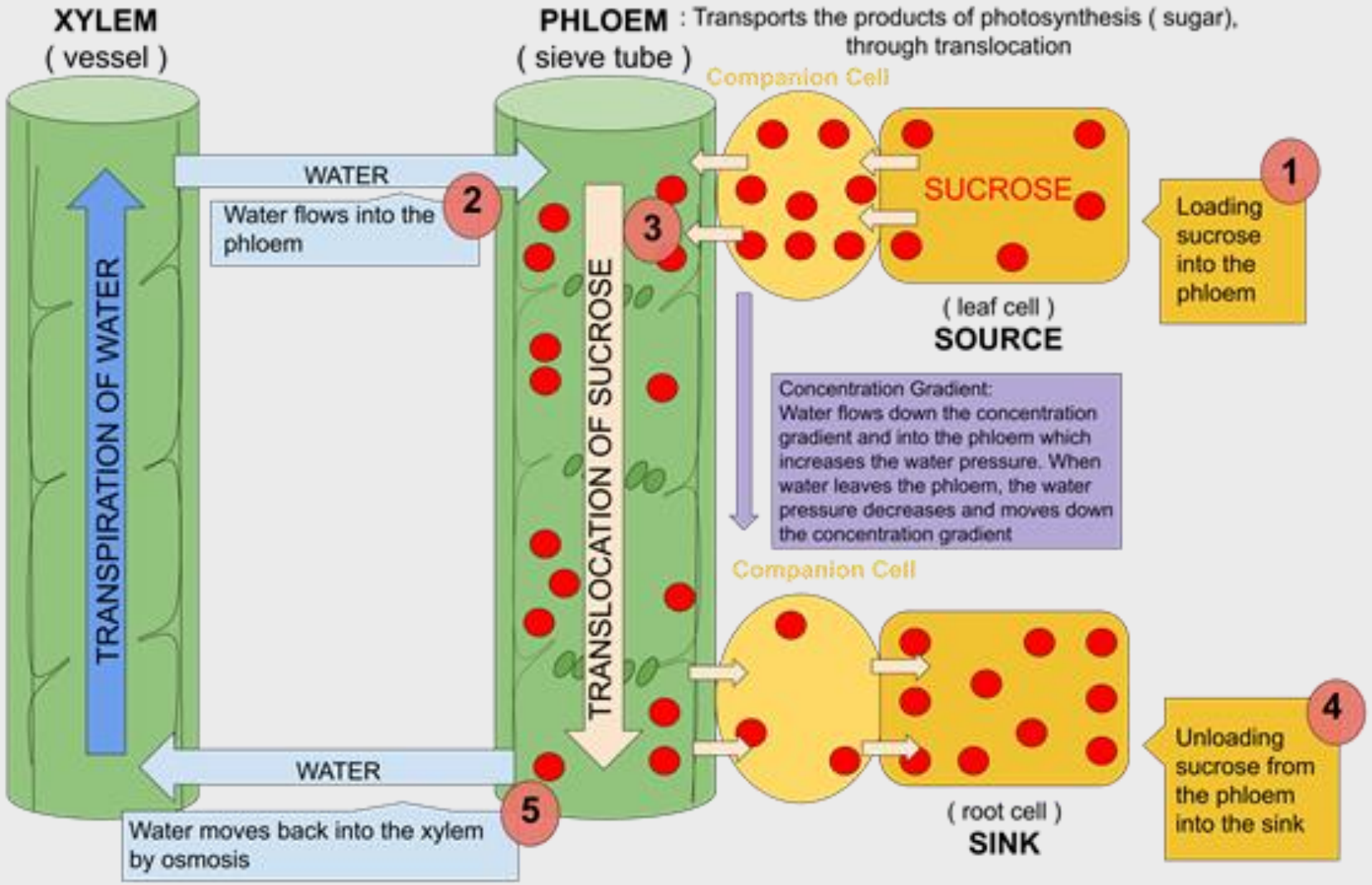
Ans B

(a) **Phloem transports water and minerals**: This is incorrect. Water and minerals are primarily transported by the xylem, not the phloem.

(b) **Phloem transports photosynthetic products**: This is correct. The phloem transports the products of photosynthesis, such as sugars, from the leaves to other parts of the plant.

(c) **Phloem is a simple tissue**: This is incorrect. Phloem is a complex tissue composed of several types of cells, including sieve tubes, companion cells, and parenchyma cells.

(d) **Phloem gives support to the plant**: This is incorrect. The phloem primarily functions in the transport of nutrients, while support is mainly provided by other tissues like xylem and collenchyma.



Q. Mature sclerenchyma cells have

(a) cellulose wall and are living
(b) lignified wall and are living
(c) suberized wall and are dead
(d) lignified wall and are dead

Mature sclerenchyma cells are specialized plant cells that provide structural support and strength to various parts of the plant. These cells are characterized by the following:

•**Thick, lignified walls**: The cell walls are heavily thickened with lignin, making them rigid and strong.

•**Dead at maturity**: Unlike other plant cells, mature sclerenchyma cells lose their protoplasm and are non-living at maturity, functioning purely as support structures.

•**Types**: There are two main types of sclerenchyma cells:

- **Fibers**: Long, slender cells that provide tensile strength (e.g., found in stems, roots, and vascular bundles).
- **Sclereids**: Shorter, irregularly shaped cells that contribute to the hardness of seed coats, nutshells, and some fruits like pears (stone cells).

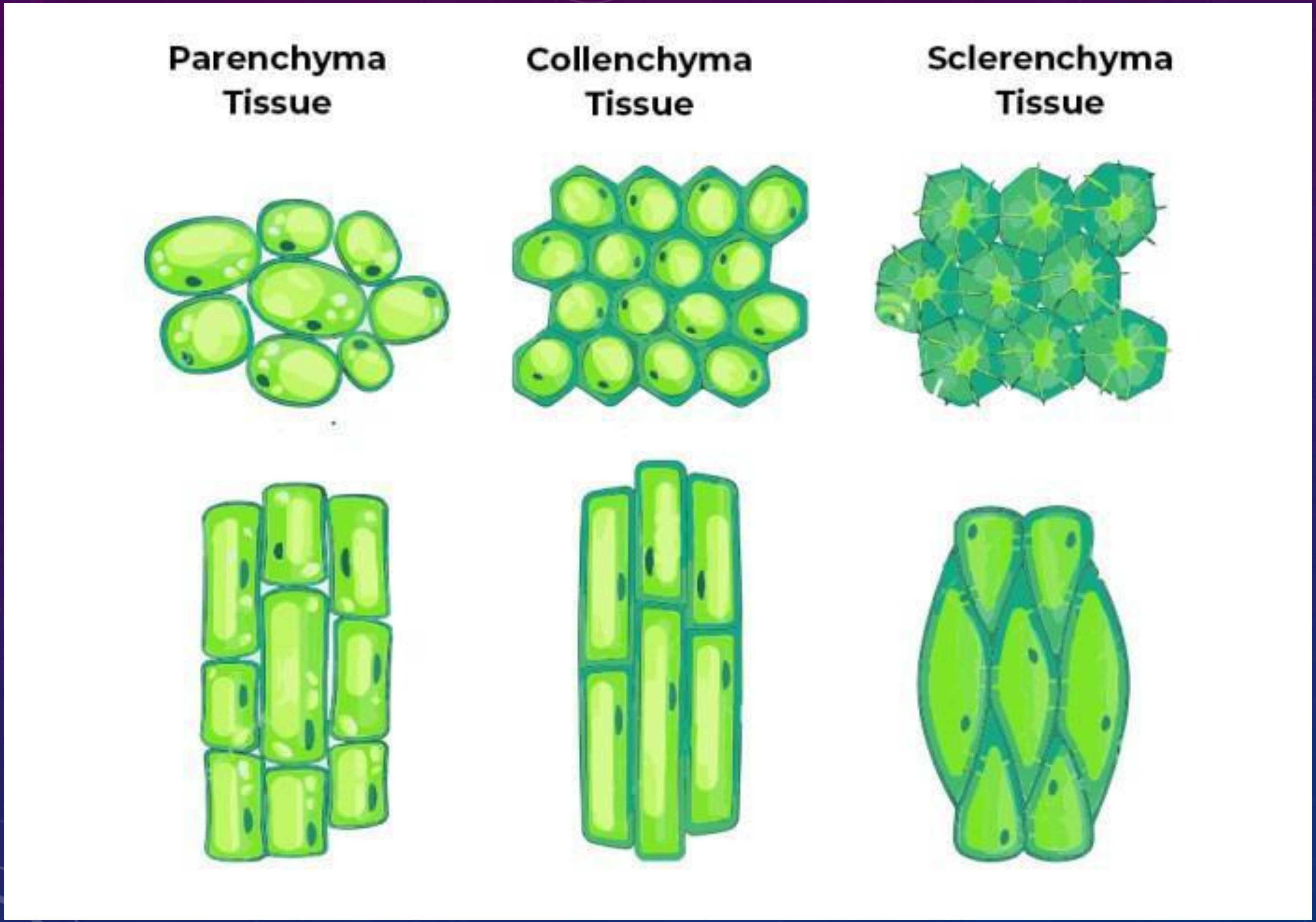
Ans D

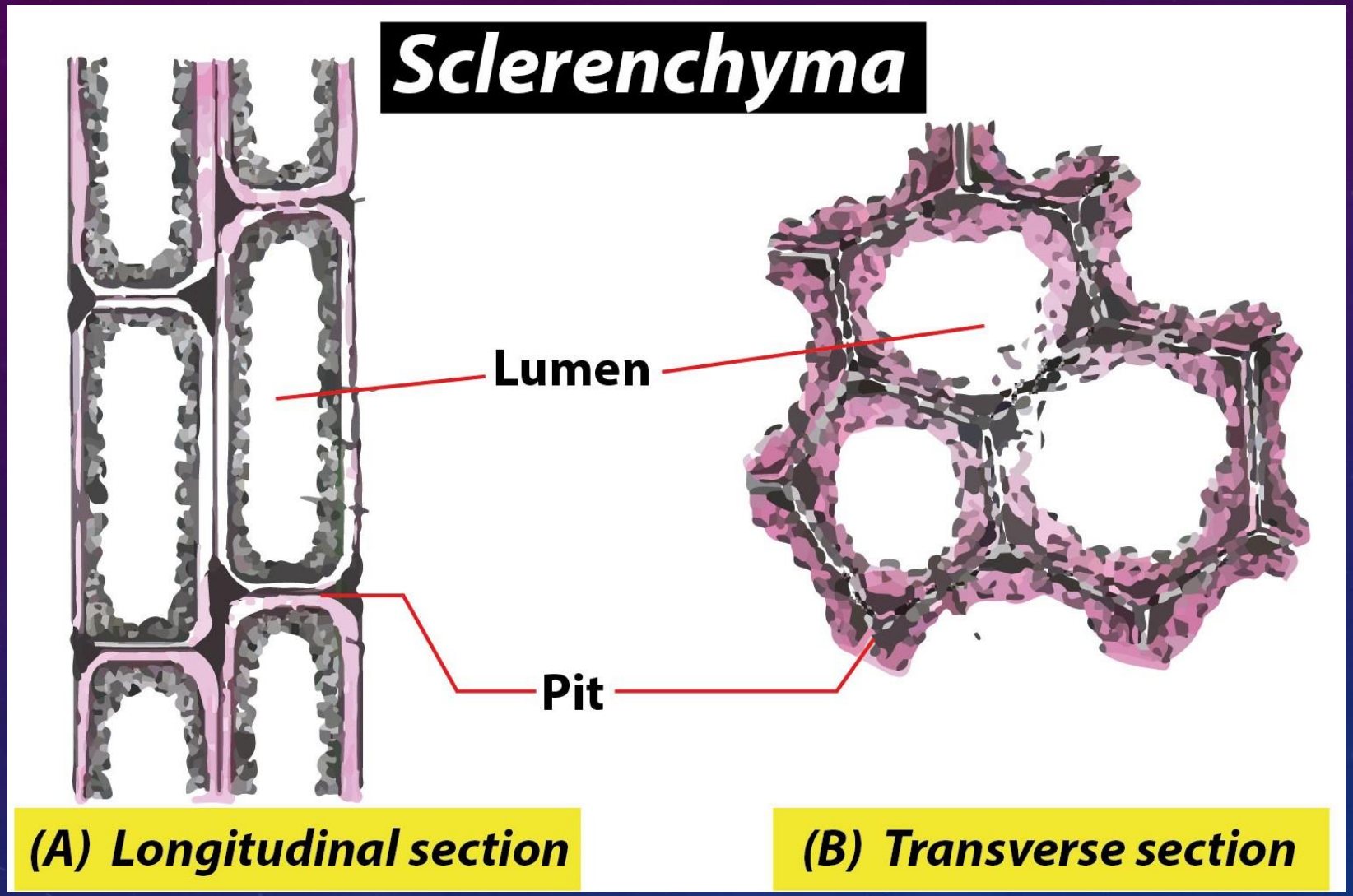
(a) **Cellulose wall and are living**: This describes the structure of parenchyma cells, not sclerenchyma cells. Sclerenchyma cells have lignified walls and are typically dead at maturity.

(b) **Lignified wall and are living**: Sclerenchyma cells have lignified walls but are usually dead at maturity. Living cells with lignified walls are not characteristic of sclerenchyma.

(c) **Suberized wall and are dead**: Suberized walls are found in cork cells, not sclerenchyma cells. Sclerenchyma cells have lignified, not suberized, walls.

(d) **Lignified wall and are dead**: This is correct. Sclerenchyma cells have lignified walls that provide structural support and are typically dead at maturity.





Q. In human beings, the chromosomes that determine birth of a normal female child are

(a) one X chromosome from mother and one X chromosome from father

(b) one X chromosome from mother and one Y chromosome from father

(c) two X chromosomes from mother and one X chromosome from father

(d) one X chromosome and one Y chromosome from father and one X chromosome from mother

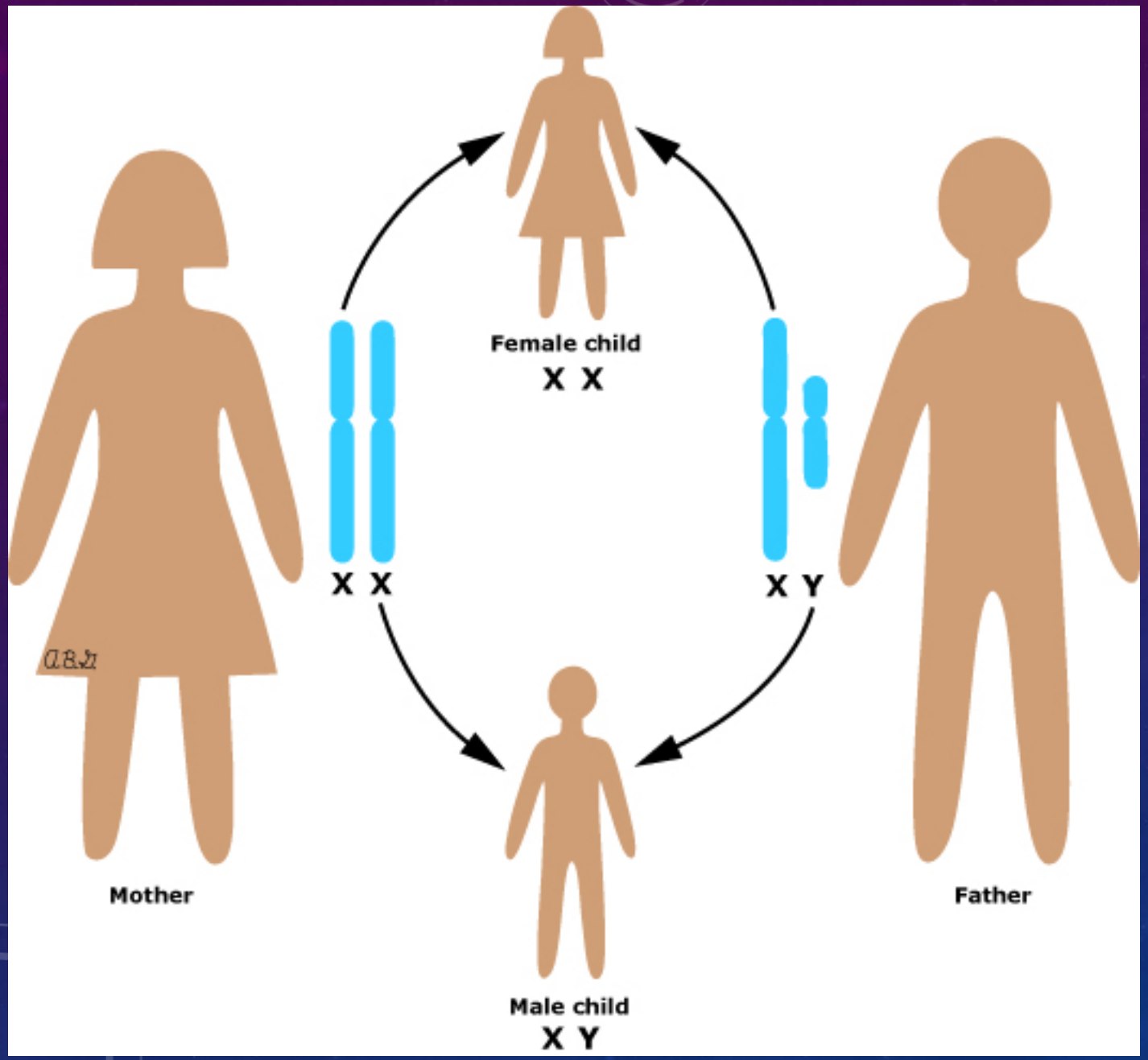
Ans A

(a) **one X chromosome from mother and one X chromosome from father**: This is correct. In humans, a normal female child has two X chromosomes, one inherited from the mother and one from the father.

(b) **one X chromosome from mother and one Y chromosome from father**: This combination produces a male child, not a female.

(c) **two X chromosomes from mother and one X chromosome from father**: This is incorrect as it describes an abnormal situation. Normally, a child receives one X chromosome from each parent.

(d) **one X chromosome and one Y chromosome from father and one X chromosome from mother**: This describes a situation where the father contributes both an X and a Y chromosome, which results in a male child.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Antibiotic such as penicillin blocks

(a) cell wall formation in bacteria
(b) RNA synthesis in bacteria
(c) DNA synthesis in bacteria
(d) division in bacteria

Ans A

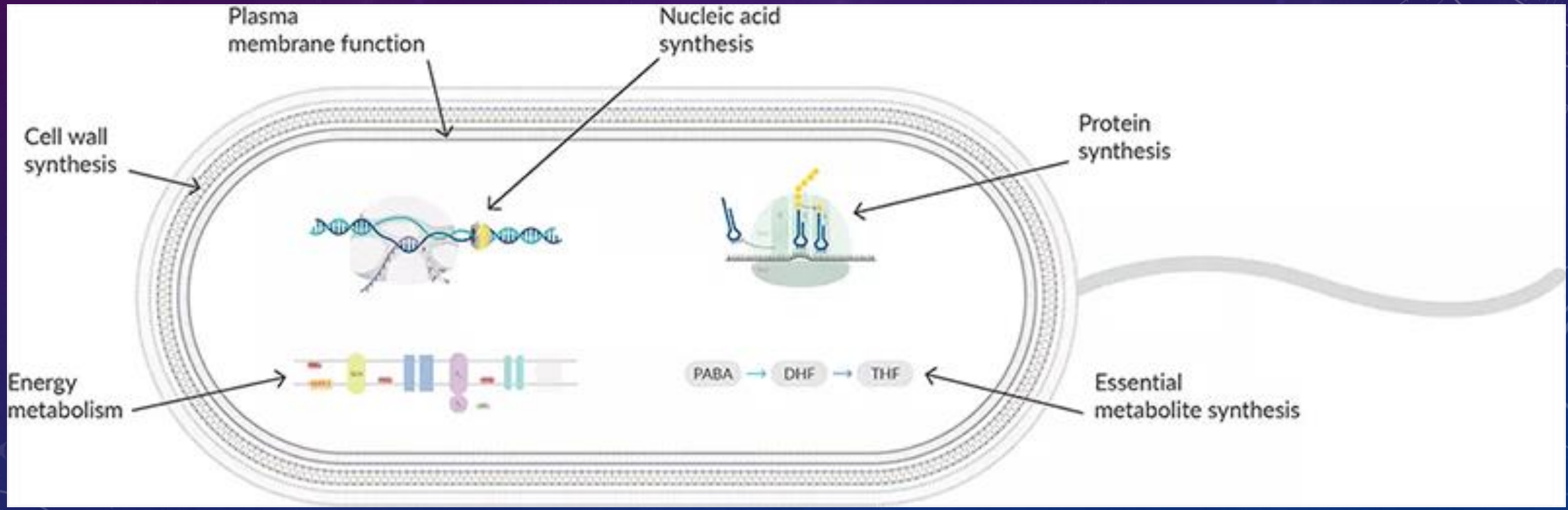
(a) **cell wall formation in bacteria**: Penicillin inhibits the synthesis of bacterial cell walls by interfering with peptidoglycan formation, which is crucial for bacterial cell wall integrity.

(b) **RNA synthesis in bacteria**: This is the target of antibiotics like rifampicin, not penicillin.

(c) **DNA synthesis in bacteria**: This is targeted by antibiotics like ciprofloxacin, not penicillin.

(d) **division in bacteria**: While penicillin affects cell wall formation, bacterial division is a broader process and is not specifically targeted by penicillin alone.

Bacteria


Plasma membrane function
Nucleic acid synthesis
Cell wall synthesis
Protein synthesis
Energy metabolism
PABA → DHF → THF
Essential metabolite synthesis

CDS 2021 (1 and 2) PYQs Biology

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Cell wall is not present in cells of

(a) Bacteria
(b) Plants
(c) Fungi
(d) Humans

Ans D

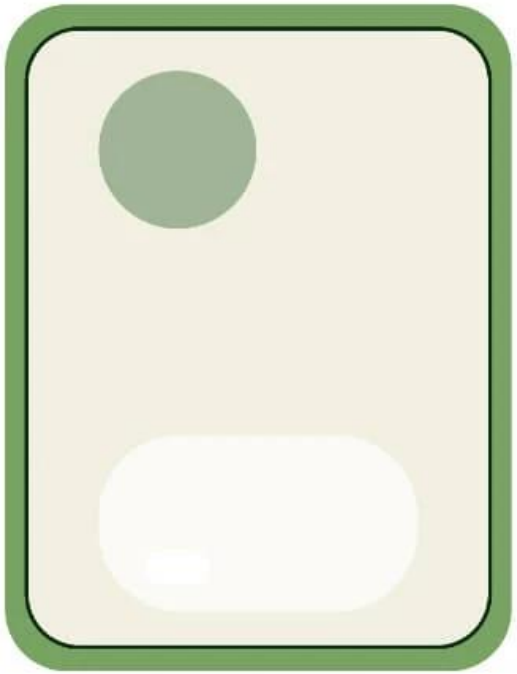
(a) Bacteria: Bacteria have cell walls that provide shape and protection. They are made of peptidoglycan.

(b) Plants: Plant cells have cell walls made of cellulose that give them structure and rigidity.

(c) Fungi: Fungal cells have cell walls made of chitin, which supports and protects them.

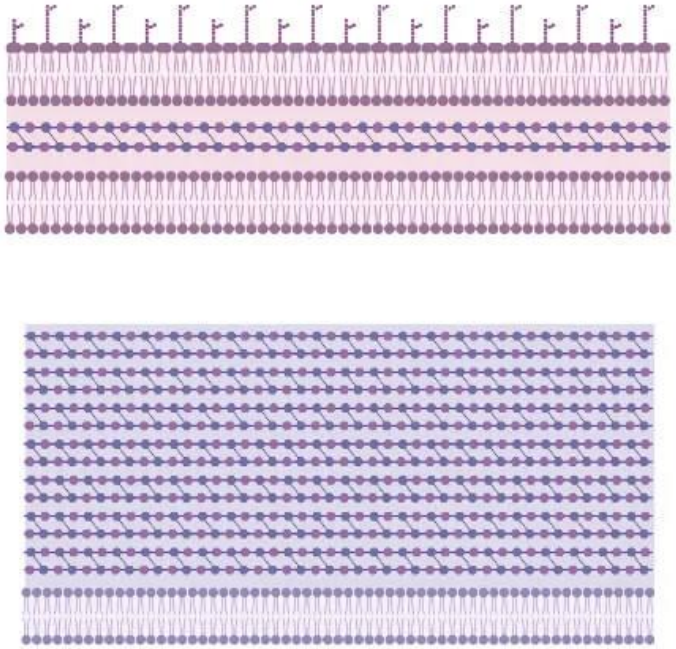
(d) Humans: Human cells do not have cell walls. They only have cell membranes, which are more flexible and allow for various functions.

Cell Wall



Plant

Fungi



Bacteria

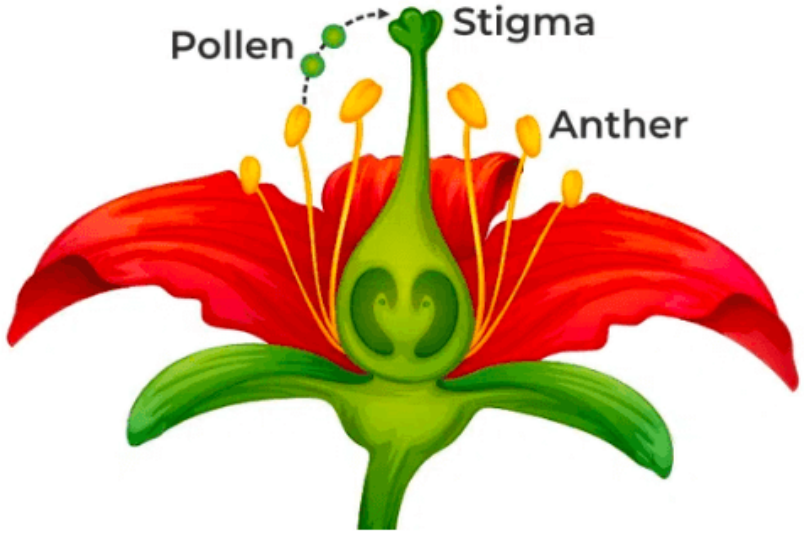
Q. A child receives a tall beautiful plant as a birthday gift from his father with a quiz. The father asked her how she would verify whether this tall plant was the progeny of both the tall parents or one tall and one short parent plant. She could verify this through

(a) cross-pollination
(b) self-pollination
(c) tissue culture
(d) negative propagation

Ans B

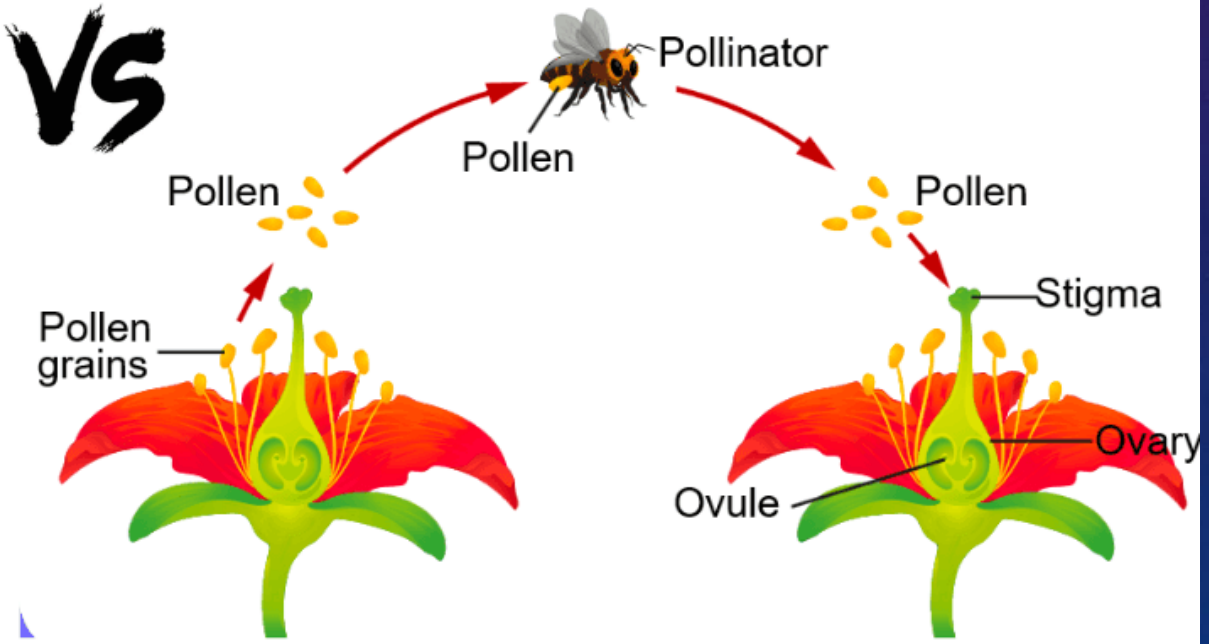
- **Self-pollination** is when pollen is transferred from the anther to the stigma of the same plant. This allows the plant to produce offspring similar to itself.
- By observing the traits of offspring from self-pollination, the child can compare them to the traits of the parent plants. If the offspring are uniform, it suggests both parents were tall. If there is a mix of traits, it indicates one parent was tall and the other short.
- **Cross-pollination** involves different plants and introduces more genetic variation, making it less useful for this purpose.
- **Tissue culture and negative propagation** are not suitable for determining parentage.
- Thus, self-pollination is the best method for determining if the tall plant came from two tall parents or one tall and one short parent.

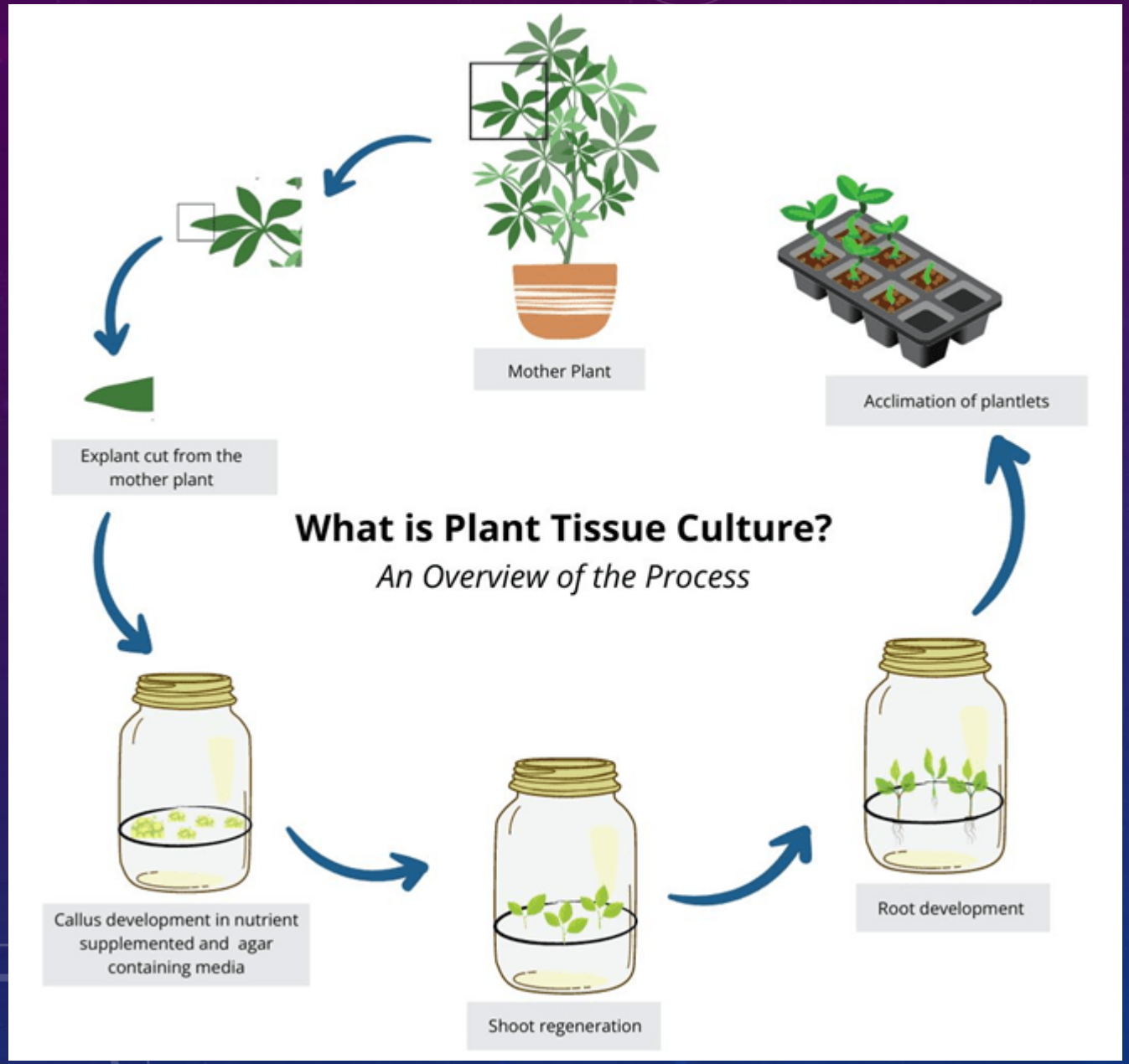
Self Pollination



VS

CROSS POLLINATION





TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. A student was doing an experiment on increasing the cell division among plants. She asked her supervisor to suggest the specific plant hormone for the same. Had you been her supervisor, which plant hormone would you suggest?

(a) Abscisic acid
(b) Gibberellins
(c) Cytokinin
(d) Auxin

Ans C

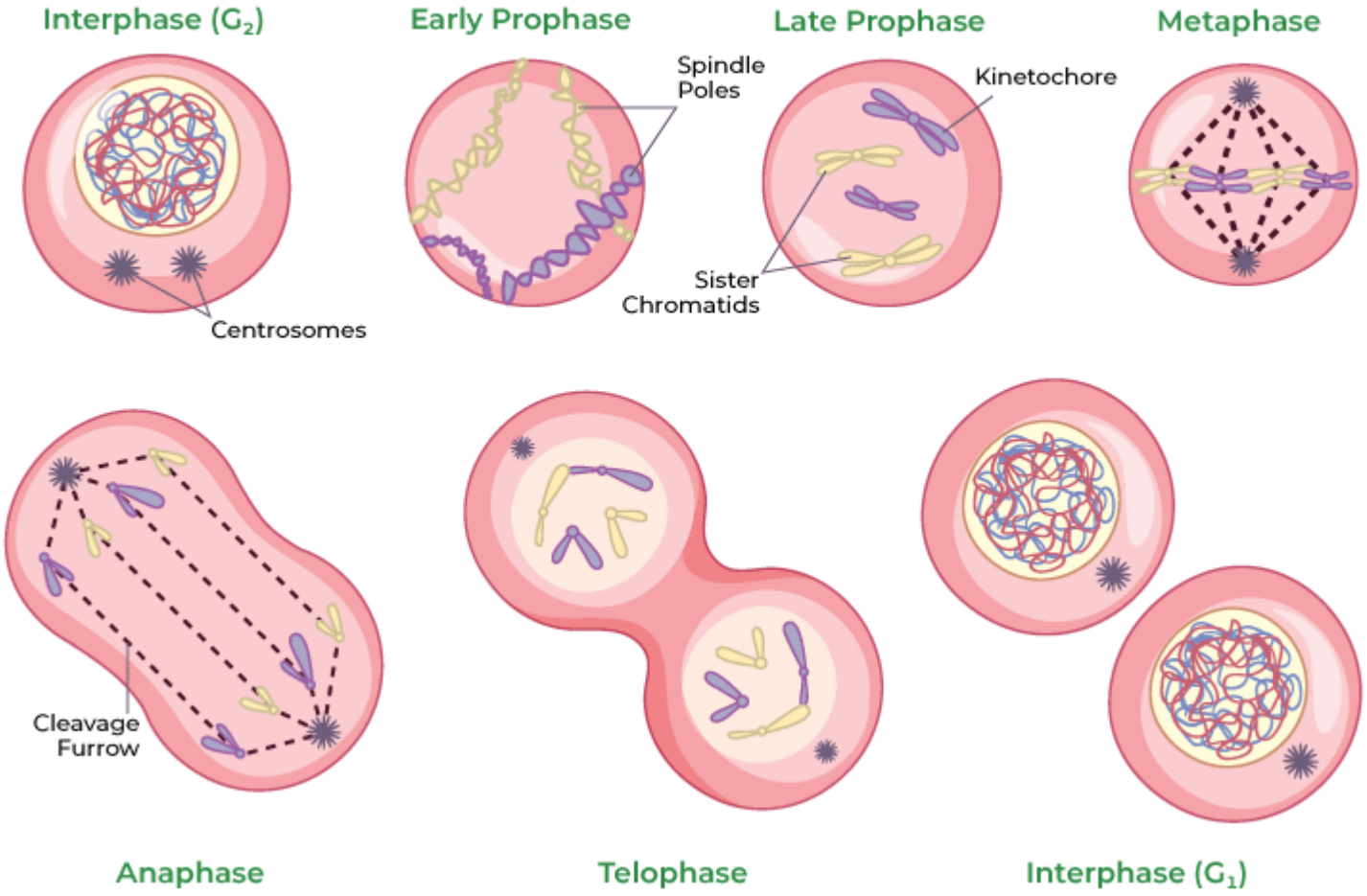
(a) **Abscisic acid**: This hormone generally inhibits cell division and promotes stress responses, so it is not suitable for increasing cell division.

(b) **Gibberellins**: These hormones promote growth and elongation, but they are more involved in processes like seed germination and stem elongation rather than directly increasing cell division.

(c) **Cytokinin**: This hormone specifically promotes cell division and differentiation, making it the best choice for increasing cell division in plants.

(d) Auxin: Auxins are involved in cell elongation and growth but are less directly associated with promoting cell division compared to cytokinins.

Cell Division



Q. Which cell organelles have their own DNA and Ribosomes?

(a) Golgi body and Endoplasmic Reticulum
(b) Mitochondria and Plastids
(c) Lysosome and Golgi body
(d) Vacuole and Plastids

Ans B

(a) **Golgi body and Endoplasmic Reticulum**: These organelles do not have their own DNA or ribosomes. They are involved in modifying and transporting proteins.

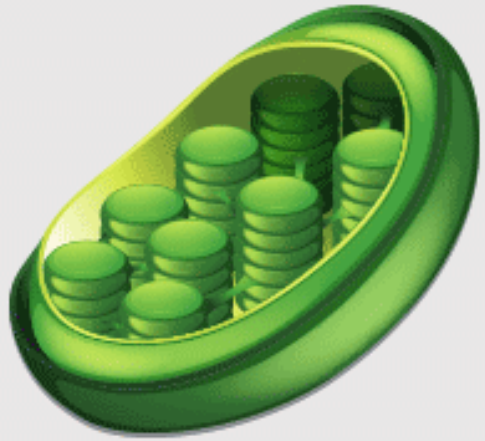
(b) **Mitochondria and Plastids**: Both mitochondria and plastids (like chloroplasts) have their own DNA and ribosomes, allowing them to produce some of their own proteins.

(c) **Lysosome and Golgi body**: These do not have their own DNA or ribosomes. Lysosomes are involved in digestion, while the Golgi body is involved in processing and packaging proteins.

(d) **Vacuole and Plastids**: While plastids have their own DNA and ribosomes, vacuoles do not.

MITOCHONDRIA

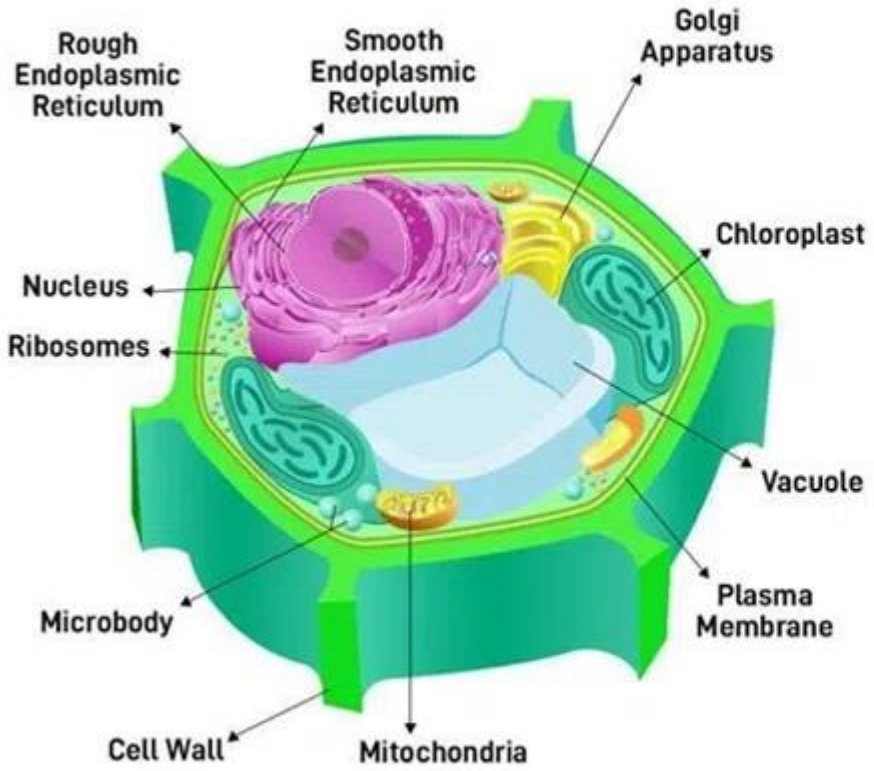
THE MITOCHONDRION IS AN ORGANELLE THAT HAS A DOUBLE MEMBRANE AND CONSISTS OF CRISTAE AND MATRIX. IT IS AN ORGANELLE THAT OCCURS IN ALMOST ALL EUKARYOTIC CELLS, BOTH PLANT AND ANIMAL CELLS.

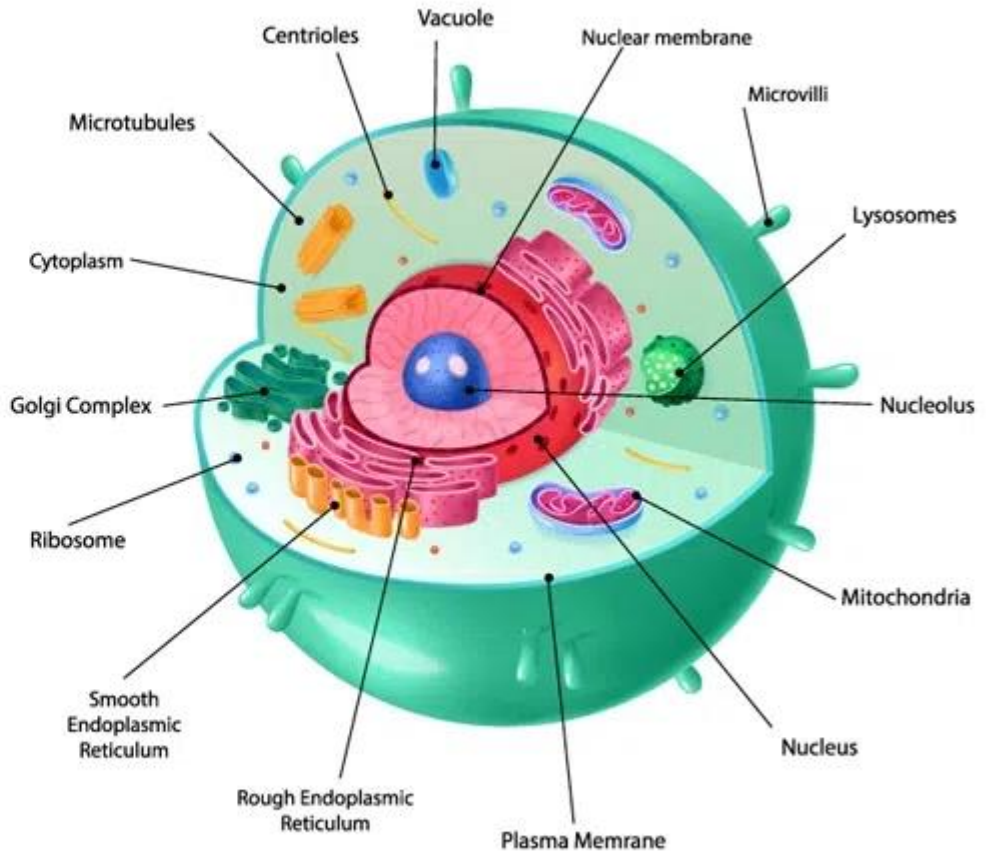


PLASTIDS

A PLASTID IS AN ORGANELLE WITH A DOUBLE MEMBRANE THAT IS FOUND IN SOME EUKARYOTIC CELLS AND USUALLY CONTAINS PIGMENTS OR STORES FOOD. PLASTIDS ARE NOT FOUND IN ANIMAL CELLS.

Plant Cell & Animal Cell Diagram





TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Osmosis is the process of movement of water molecules from its

(a) higher concentration to its lower concentration through a cell wall.
(b) lower concentration to its higher concentration through a fully permeable membrane.
(c) higher concentration to its lower concentration through a fully permeable membrane.
(d) higher concentration to its lower concentration through a semi-permeable membrane

Ans D

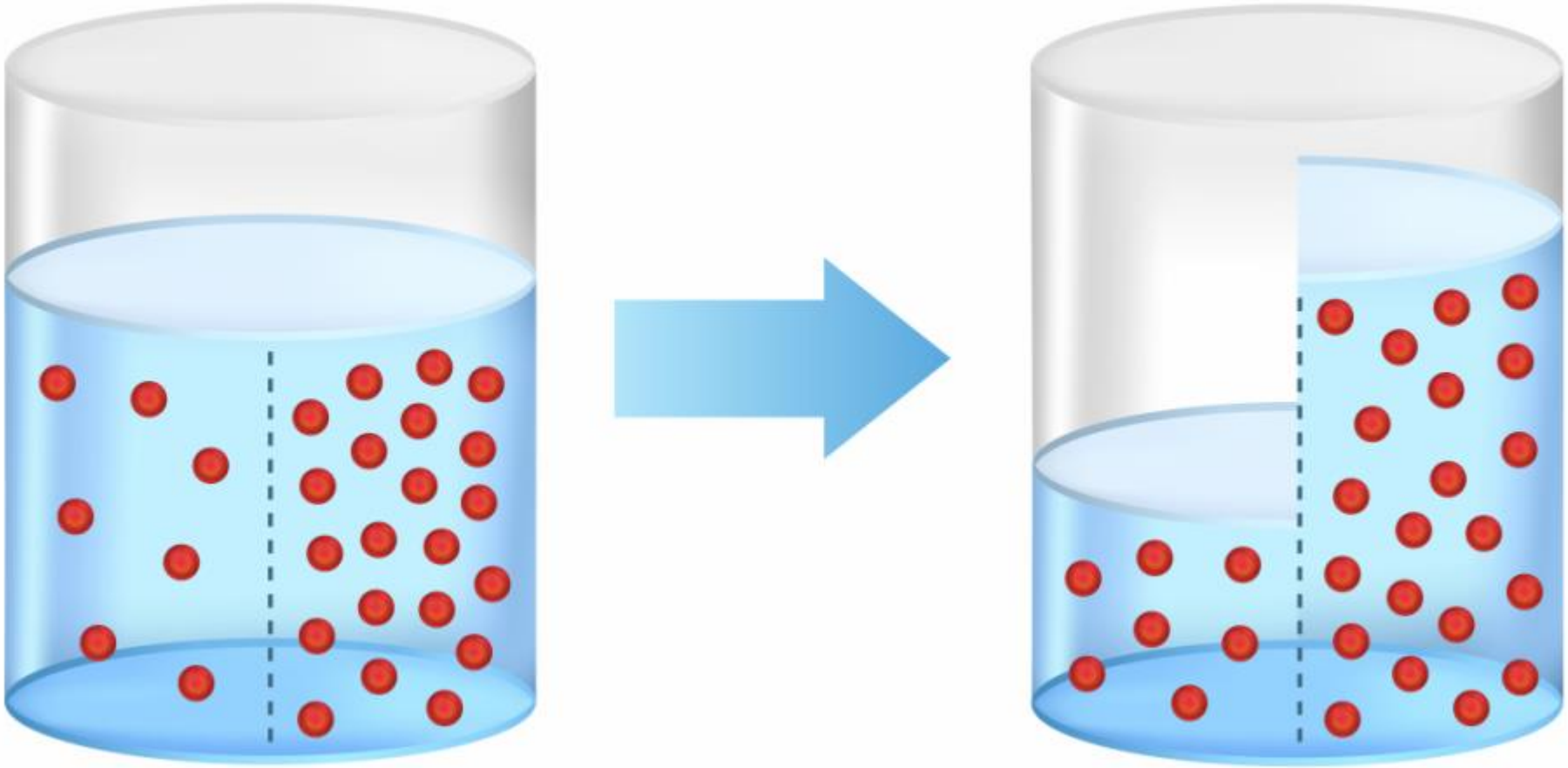
(a) Higher concentration to its lower concentration through a cell wall: Incorrect, as the cell wall is not selectively permeable and does not facilitate osmosis.

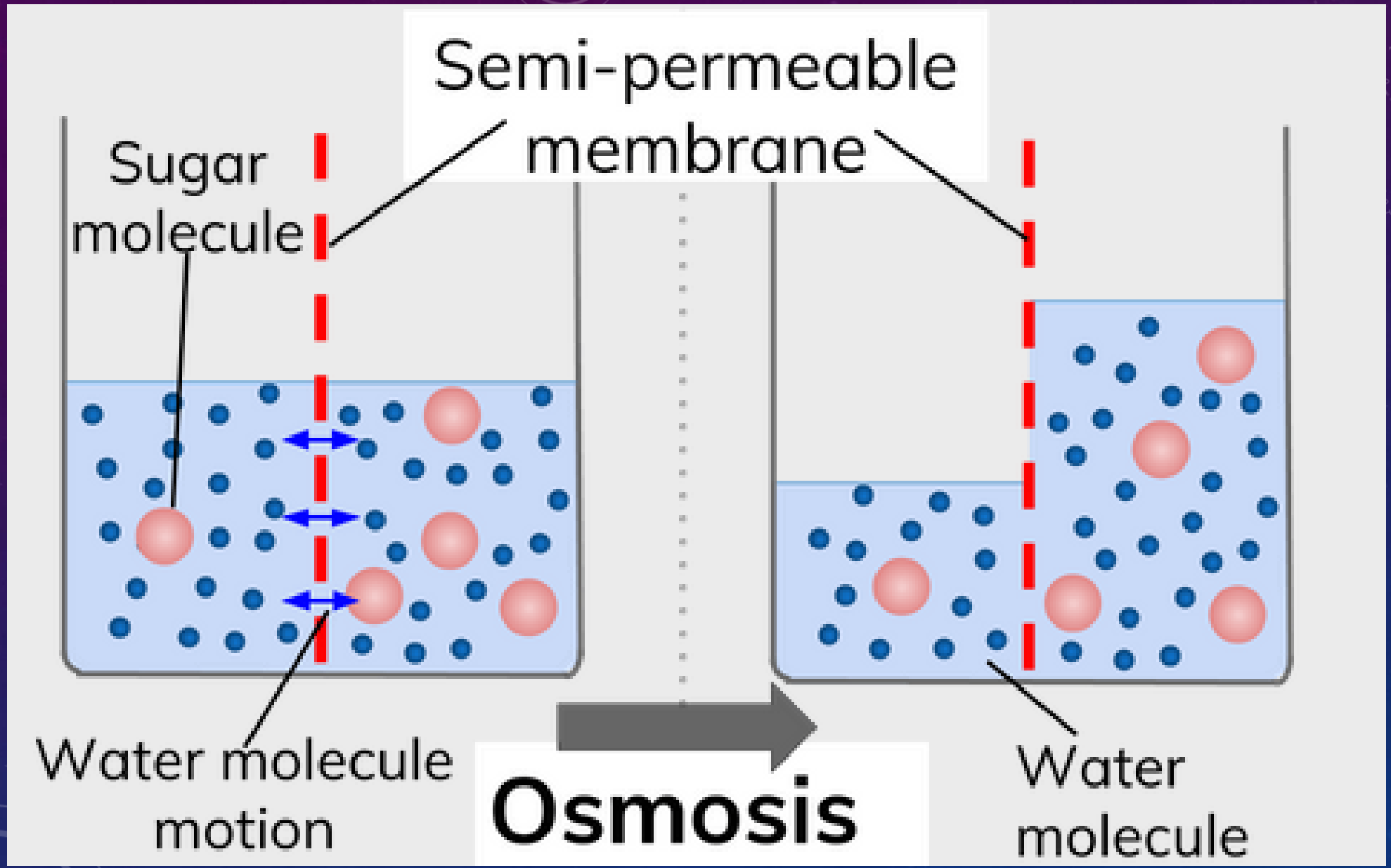
(b) Lower concentration to its higher concentration through a fully permeable membrane: Incorrect, as water moves from higher to lower concentration, and fully permeable membranes are not specific to osmosis.

(c) Higher concentration to its lower concentration through a fully permeable membrane: Incorrect, as water moves from lower to higher concentration, and fully permeable membranes are not specific to osmosis.

(d) Higher concentration to its lower concentration through a semi-permeable membrane: Correct, as osmosis involves the movement of water from an area of higher water concentration (lower solute concentration) to an area of lower water concentration (higher solute concentration) through a semi-permeable membrane.

Osmosis





Q. An antibiotic is not useful against a virus whereas a vaccine is. Which one of the following is the most appropriate reason for this?

(a) An antibiotic can break RNA only, whereas virus has DNA.
(b) An antibiotic is a carbohydrate in its chemical nature, whereas a vaccine is a protein which works well to kill a virus.
(c) Only a vaccine can break the genetic material of a virus.
(d) A virus does not use biochemical
pathways which can be blocked by an antibiotic. But a vaccine can boost an immune system to fight the virus.

Ans D

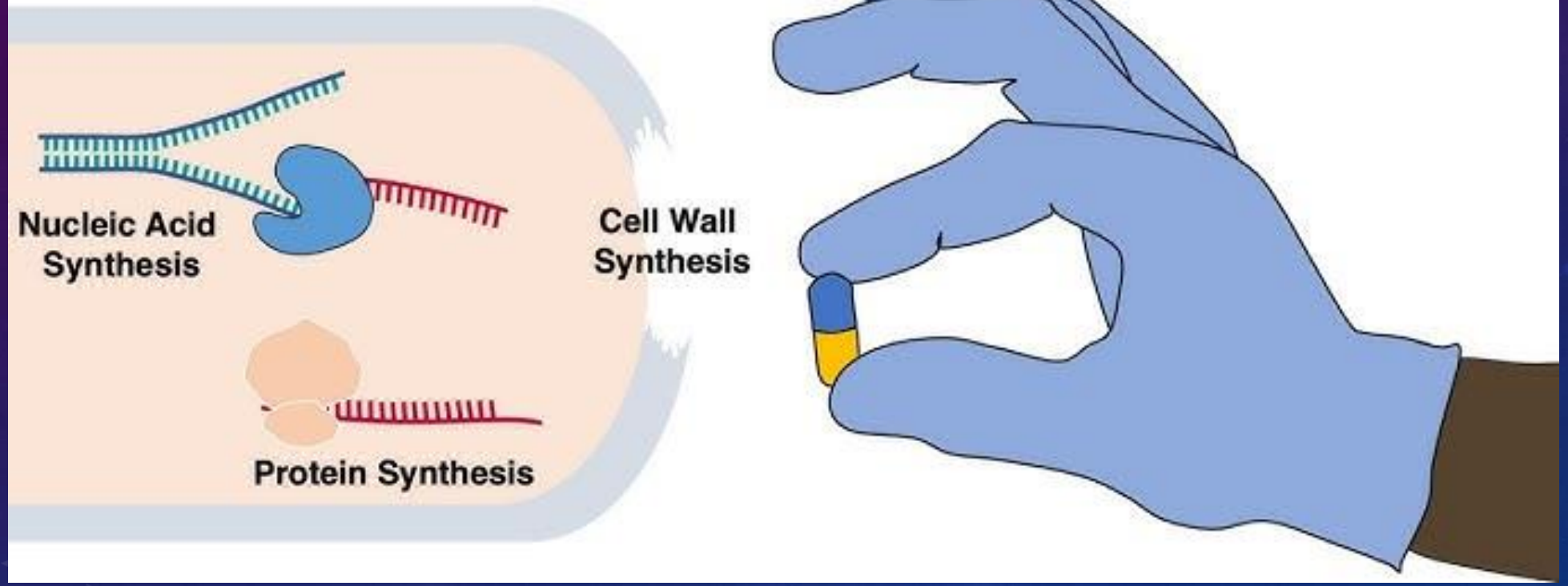
(a) An antibiotic can break RNA only, whereas virus has DNA: Incorrect, as antibiotics do not specifically target RNA or DNA; they generally target bacterial functions and structures.

(b) An antibiotic is a carbohydrate in its chemical nature, whereas a vaccine is a protein which works well to kill a virus: Incorrect, as antibiotics are not carbohydrates; they are typically complex organic molecules targeting bacterial processes. Vaccines are not proteins but rather preparations that stimulate the immune system.

(c) Only a vaccine can break the genetic material of a virus: Incorrect, as vaccines do not break the genetic material of viruses. Instead, they stimulate the immune system to recognize and fight the virus.

(d) A virus does not use biochemical pathways which can be blocked by an antibiotic. But a vaccine can boost an immune system to fight the virus: Correct, as antibiotics target specific bacterial biochemical pathways and structures, which viruses do not possess. Vaccines, however, stimulate the immune system to recognize and combat viruses effectively.

Antibiotics



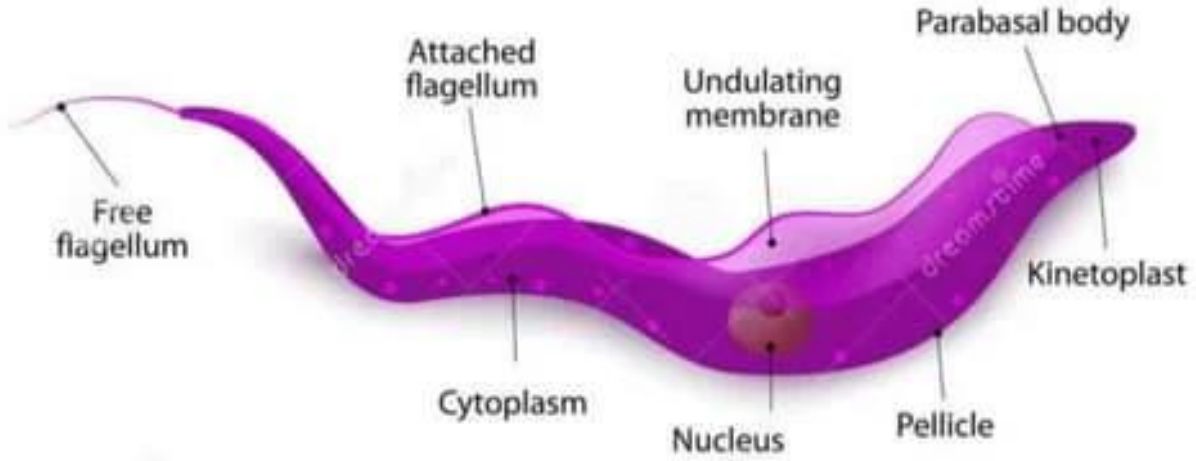
Q. 'Sleeping sickness' is caused by

(a) Trypanosoma
(b) Leishmania
(c) Plasmodium
(d) Paramecium

Ans A

(a) Trypanosoma: Correct. Specifically, it is caused by *Trypanosoma brucei* and is transmitted by the tsetse fly.
(b) Leishmania: Incorrect. Leishmania causes leishmaniasis, not sleeping sickness.
(c) Plasmodium: Incorrect. Plasmodium causes malaria.
(d) Paramecium: Incorrect. Paramecium is a protozoan that is not associated with sleeping sickness.

Trypanosoma



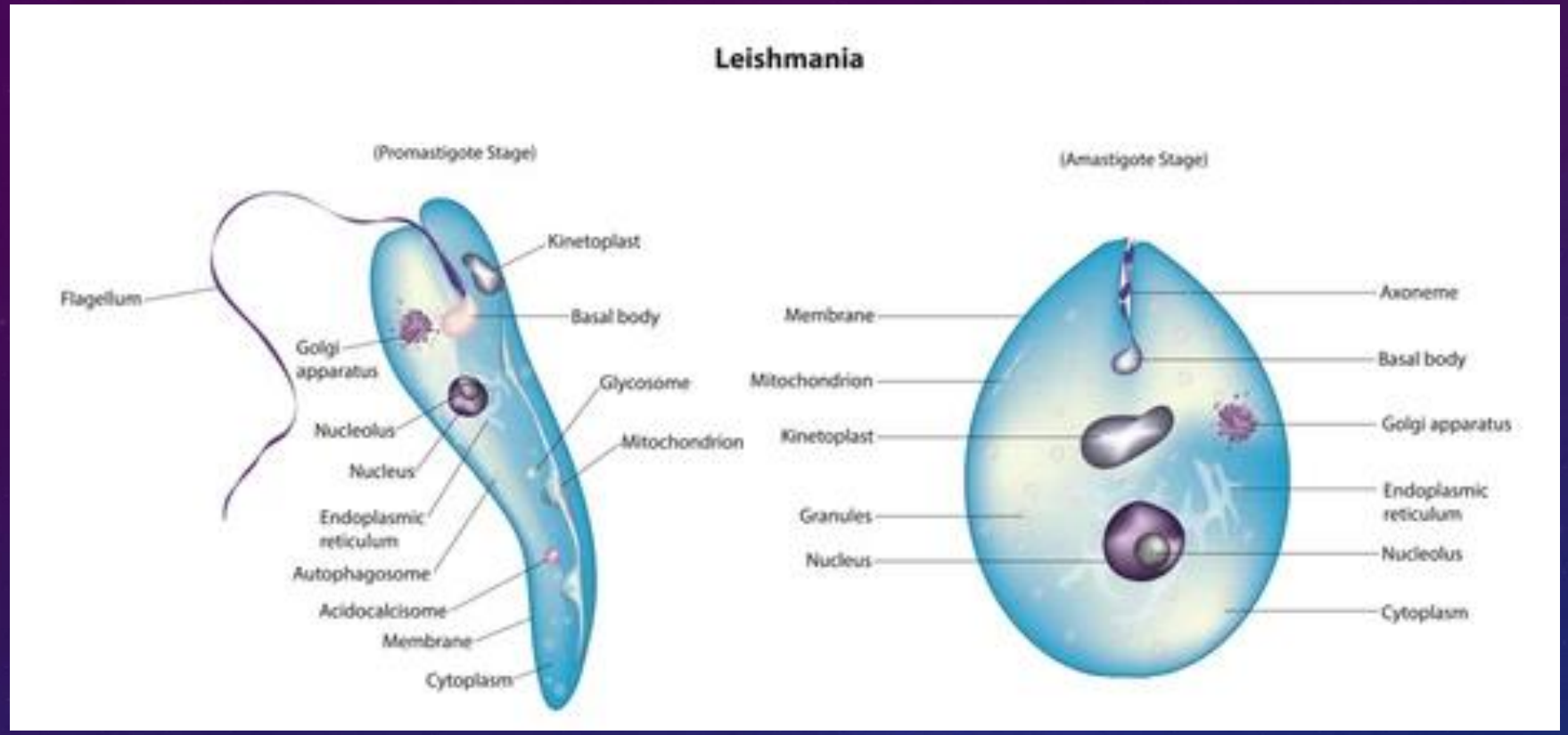
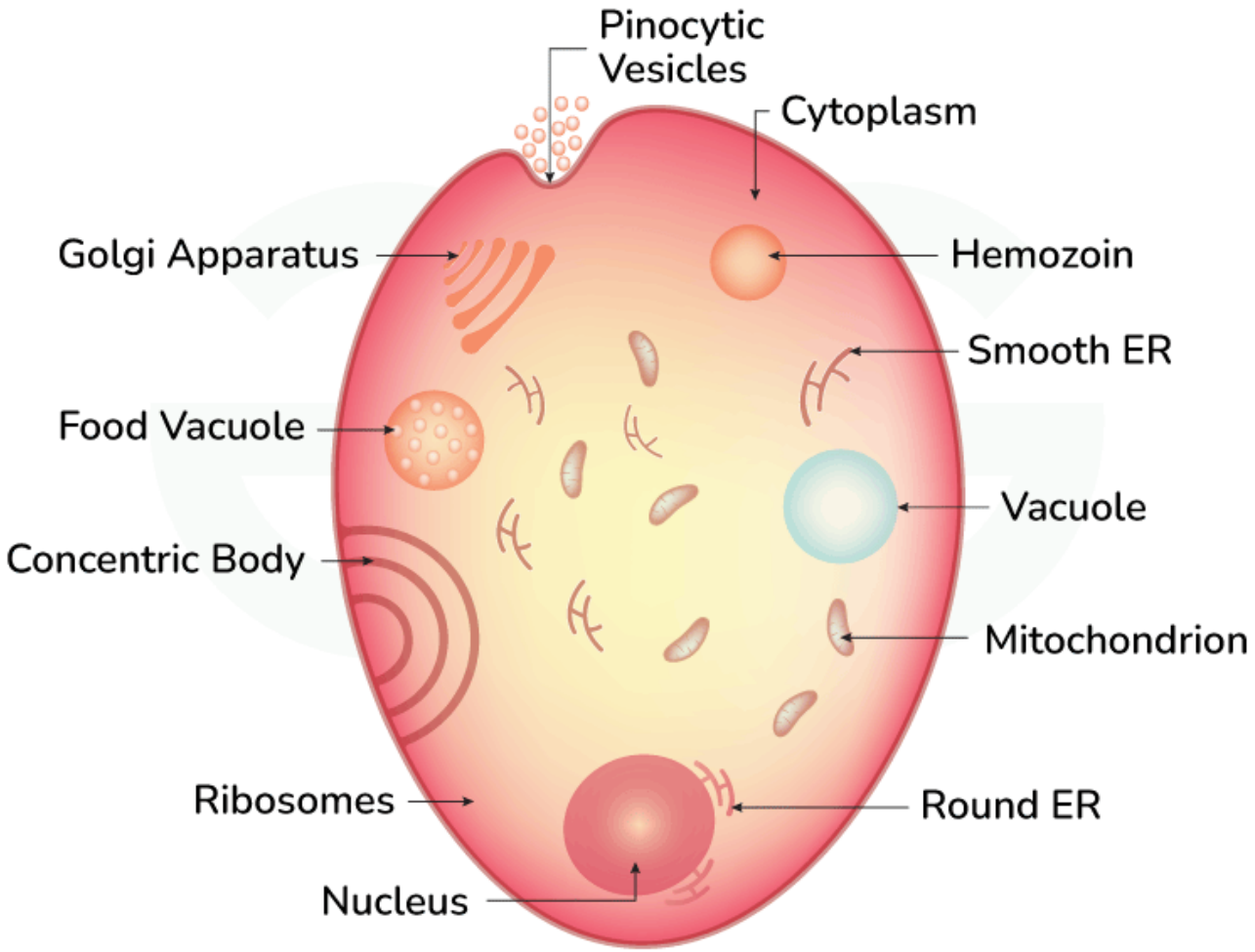
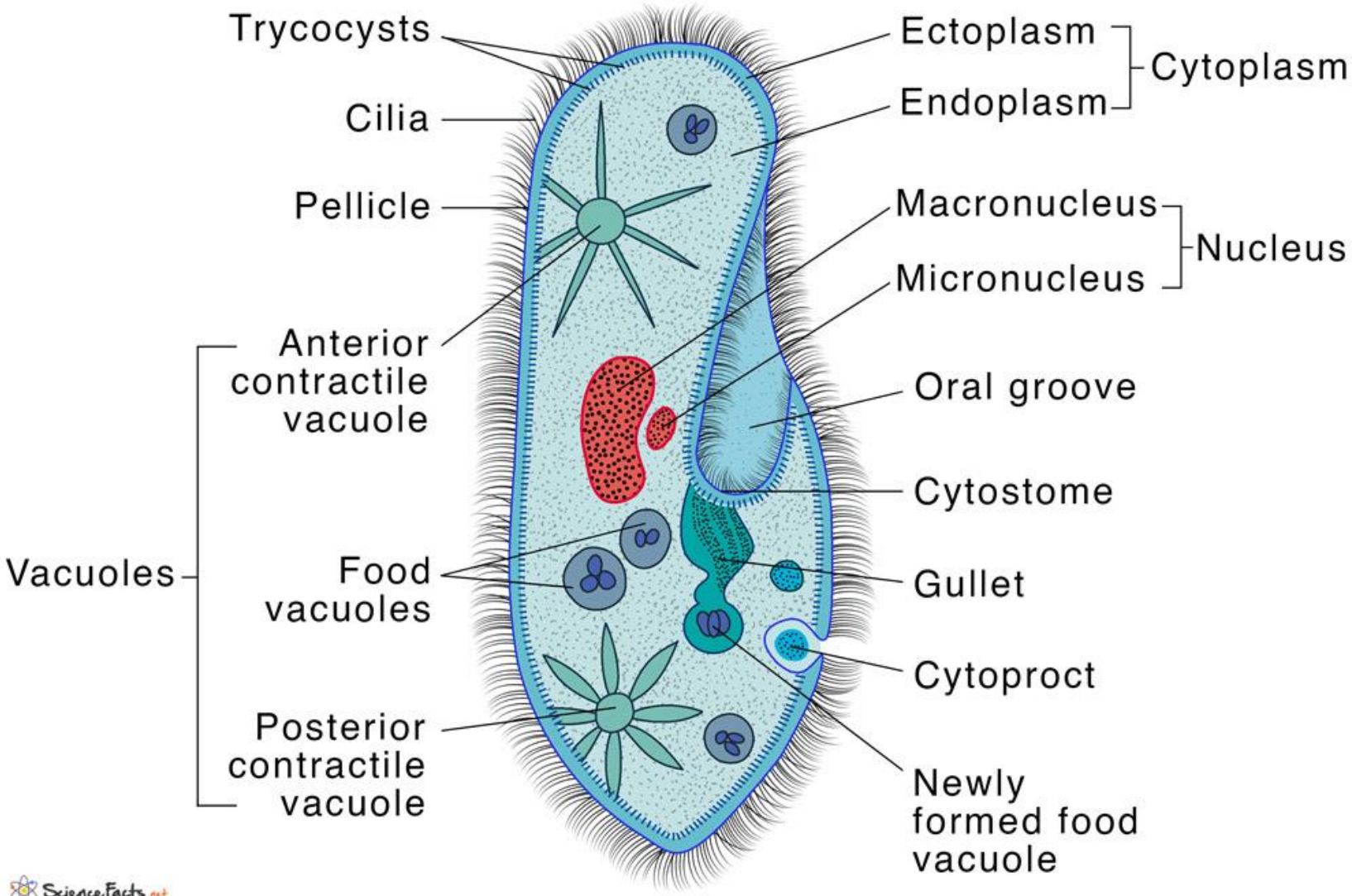


Diagram of Plasmodium



Paramecium



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SHAPING CAREERS WITH DEVOTION

Q. Which one among the following is a free living animal ?

(a) Liver fluke
(b) Wuchereria
(c) Plasmodium
(d) Planaria

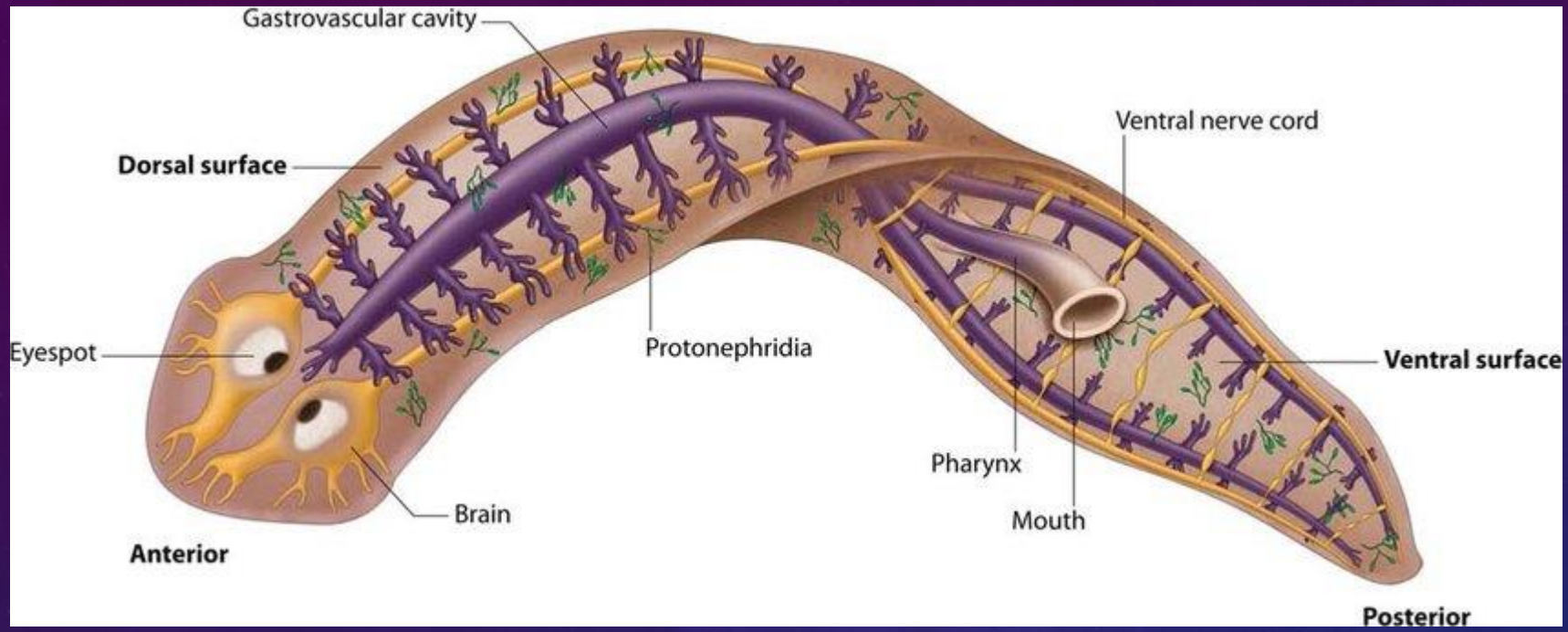
Ans D

(a) Liver fluke: Incorrect. Liver flukes are parasitic, living inside the liver of various animals.

(b) Wuchereria: Incorrect. *Wuchereria bancrofti* is a parasitic worm that causes lymphatic filariasis.

(c) Plasmodium: Incorrect. *Plasmodium* is a parasitic protozoan that causes malaria.

(d) Planaria: Correct. Planaria are free-living flatworms commonly found in freshwater environments and are not parasitic.



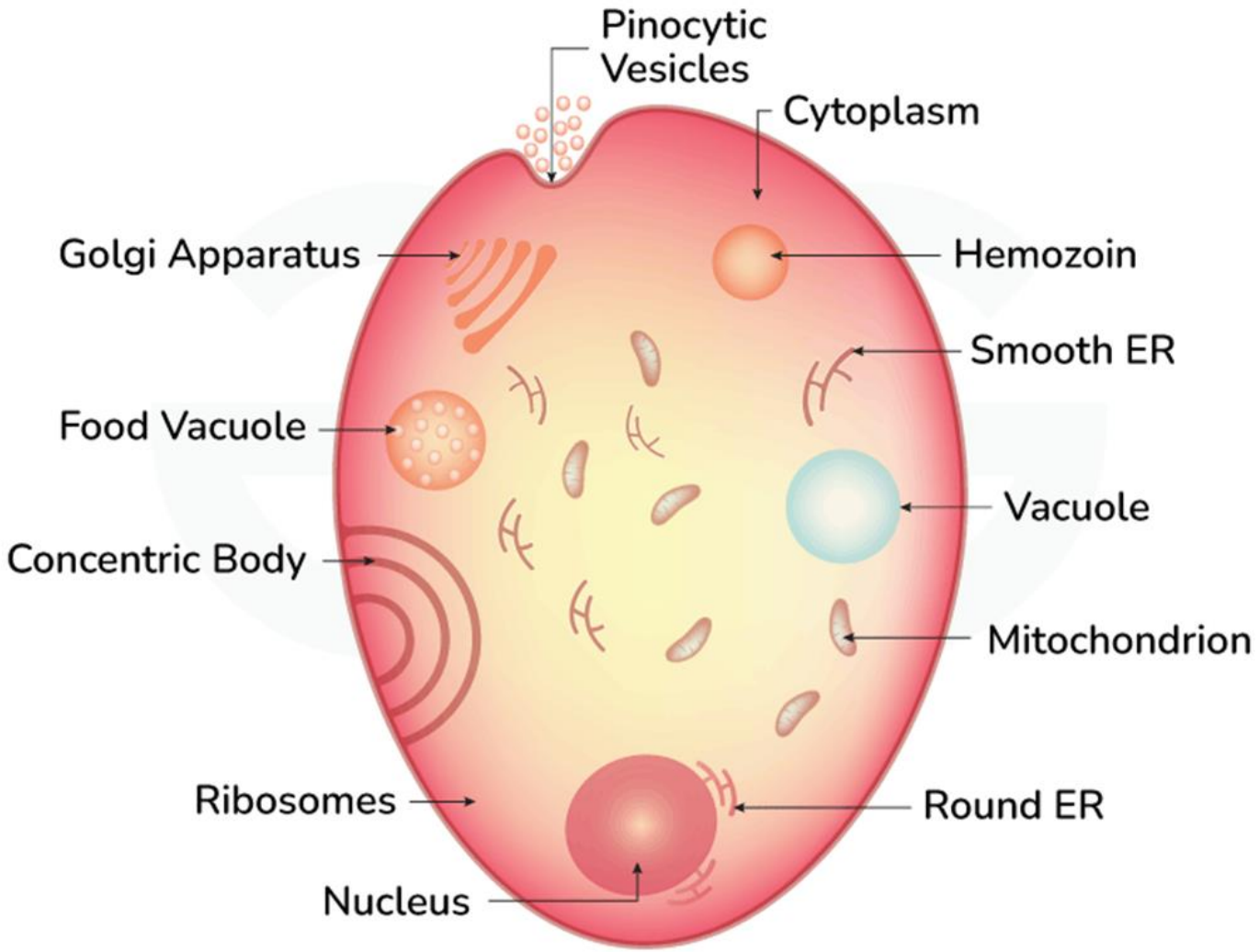
Planaria

Liver fluke

Wuchereria

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Diagram of Plasmodium



Q. Which one of the following is the structure of a cardiac muscle cell?

(a) Cylindrical, Unbranched and Multinucleate
(b) Spinal shaped, Unbranched and Uninucleate
(c) Spinal shaped, Branched and Uninucleate
(d) Cylindrical, Branched and Uninucleate

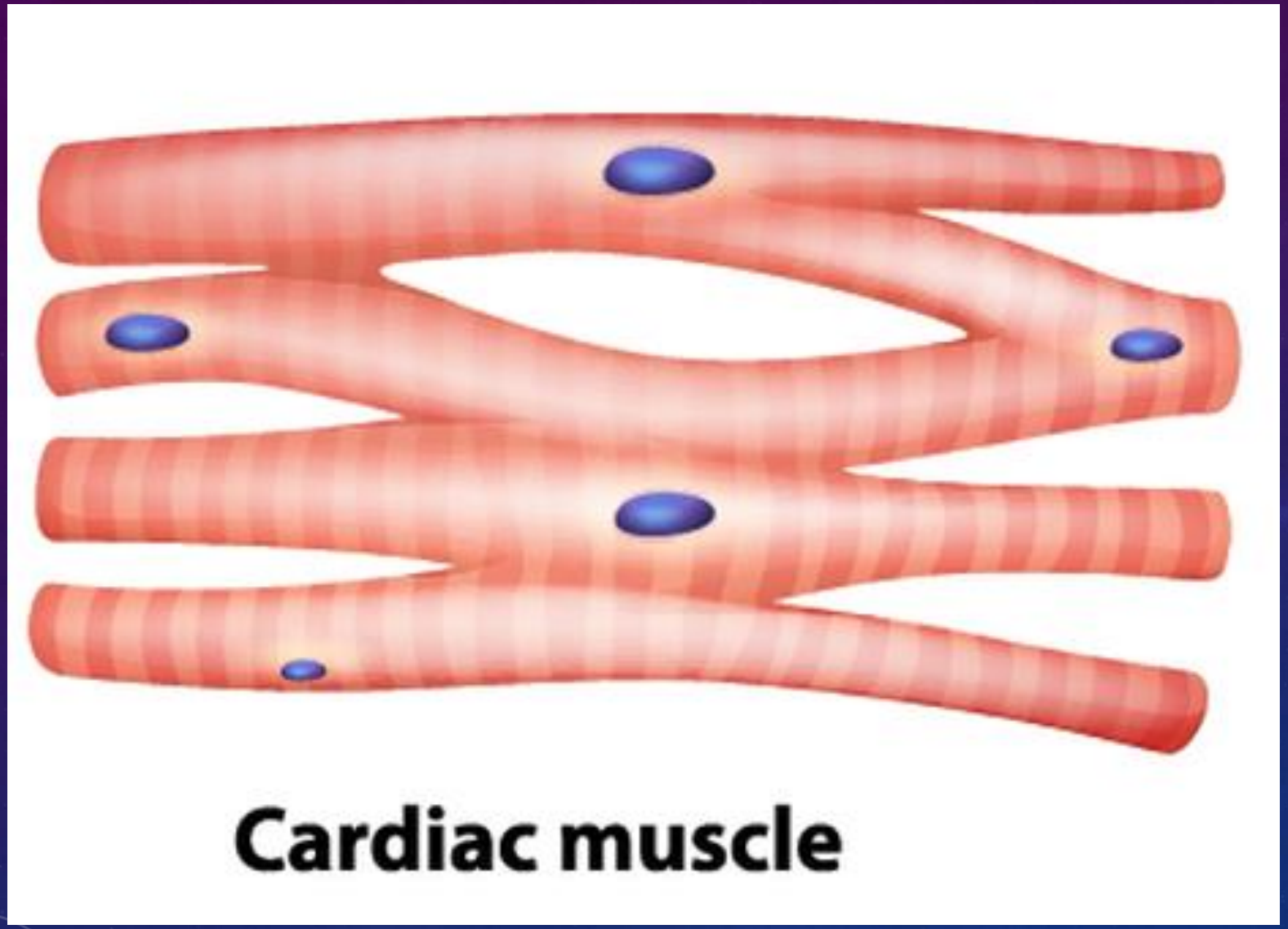
Ans D

(a) Cylindrical, Unbranched and Multinucleate: Incorrect. Cardiac muscle cells are not unbranched and typically have a single nucleus.

(b) Spinal shaped, Unbranched and Uninucleate: Incorrect. Cardiac muscle cells are not spinal shaped and are branched, not unbranched.

(c) Spinal shaped, Branched and Uninucleate: Incorrect. Cardiac muscle cells are not spinal shaped; they are cylindrical and typically have one nucleus, but they are branched.

(d) Cylindrical, Branched and Uninucleate: Correct. Cardiac muscle cells are cylindrical, branched, and usually contain a single nucleus.



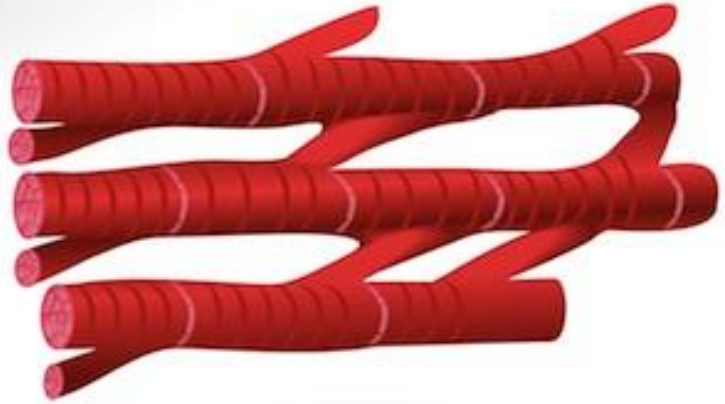
Cardiac muscle

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Skeletal muscle

Smooth muscle

Cardiac muscle



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TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Which of the following limits the number of trophic levels in a food chain?

(a) Deficient food supply
(b) Polluted air
(c) Decrease in the available energy at higher trophic levels
(d) Parasitic organisms

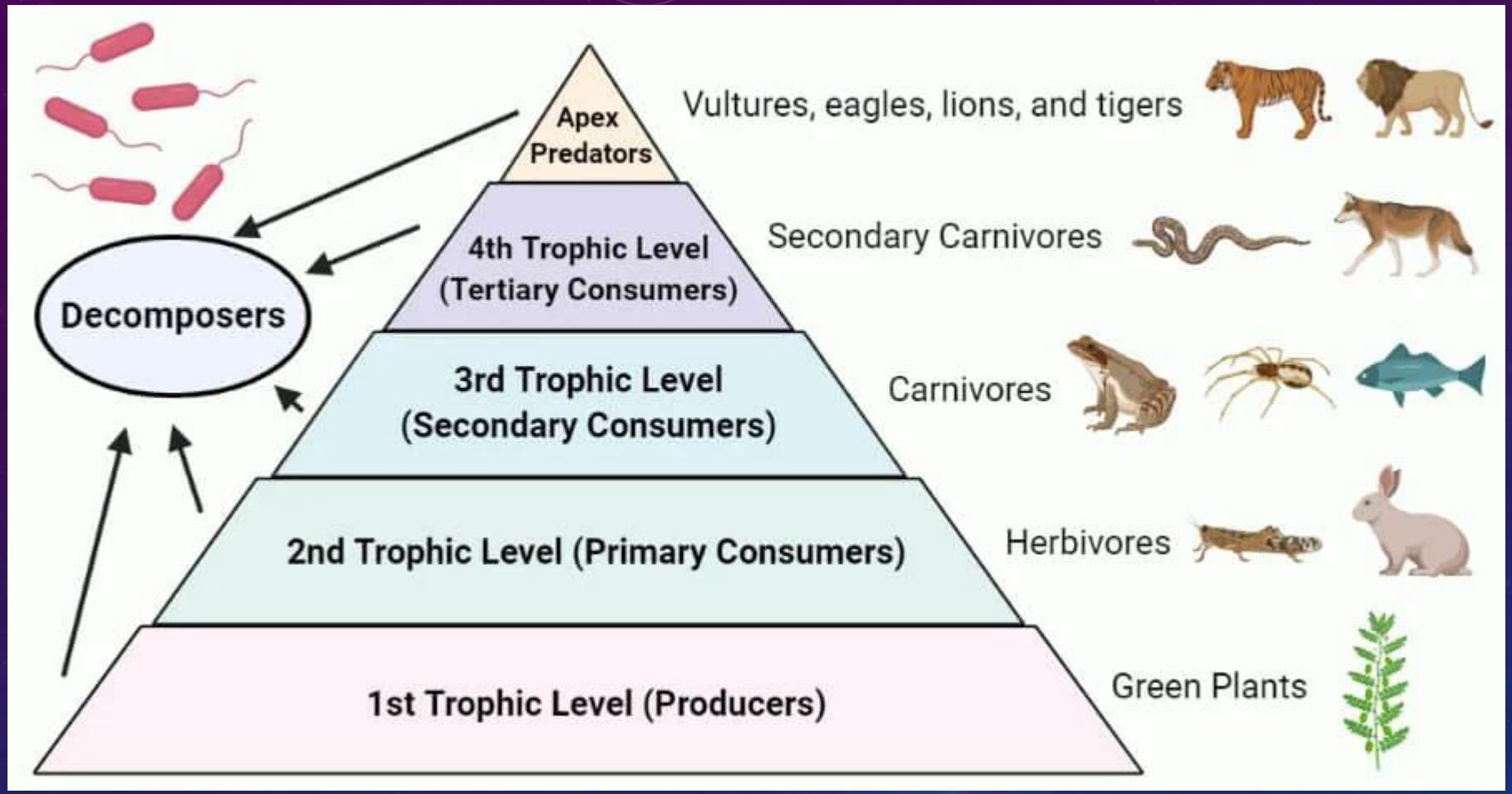
Ans C

(a) Deficient food supply: While a lack of food can affect individual organisms, it doesn't directly limit the number of trophic levels in a food chain.

(b) Polluted air: Pollution can impact ecosystems but doesn't specifically limit the number of trophic levels.

(c) Decrease in the available energy at higher trophic levels: Correct. Energy decreases as it moves up the trophic levels due to the energy loss at each level (typically around 90% is lost as heat). This loss of energy limits the number of trophic levels because there is insufficient energy to support many levels.

(d) Parasitic organisms: While parasites can affect populations, they do not directly limit the number of trophic levels in a food chain.



Q. In pea, a pure tall plant (TT) is crossed with a short plant (tt). What will be the ratio of pure tall plants to short plants in the F2 generation?

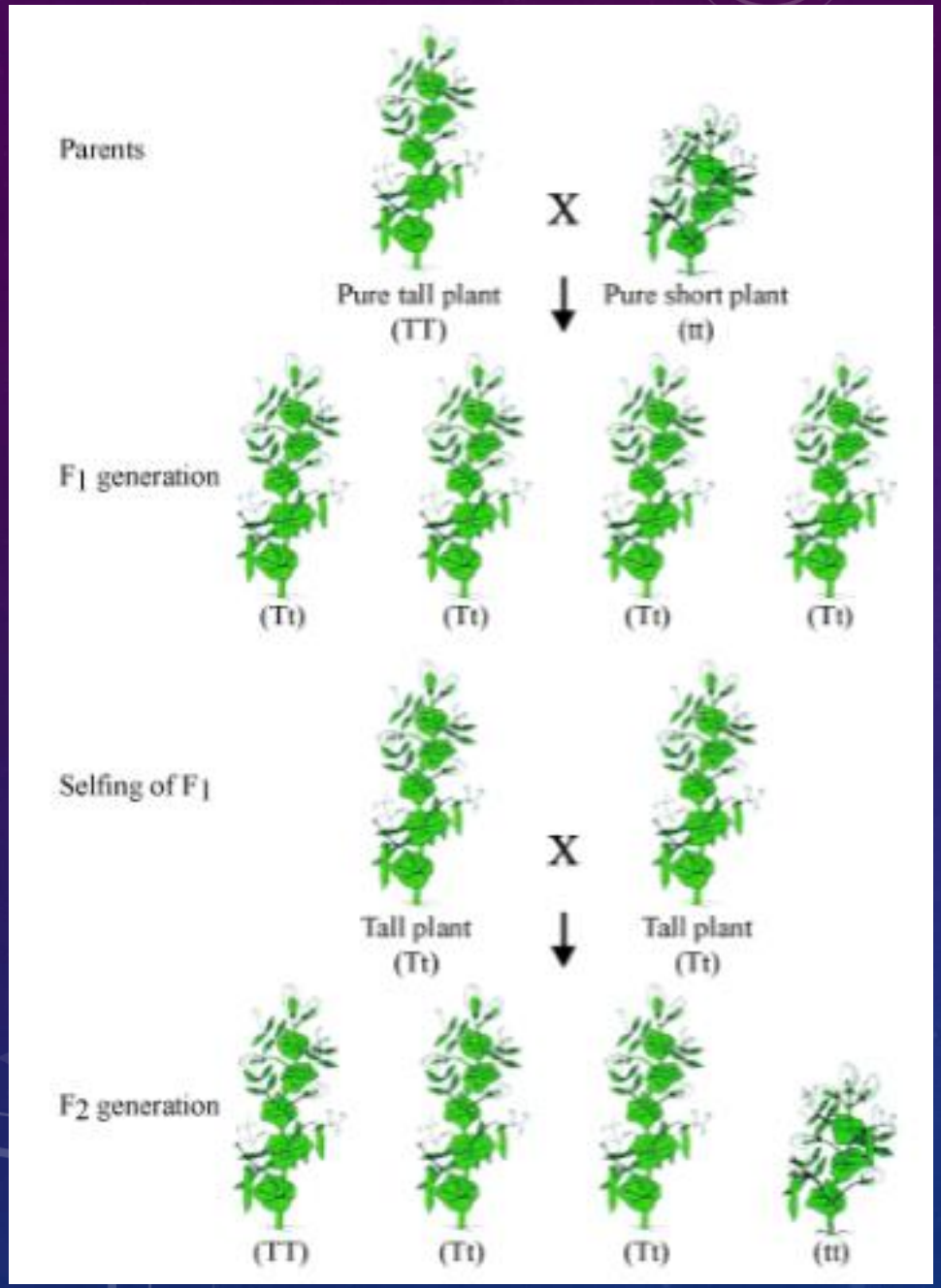
(a) 1:1
(b) 1:3
(c) 3:1
(d) 2:1

Ans A

F1 Generation: Crossing a pure tall plant (TT) with a short plant (tt) produces all heterozygous tall plants (Tt) in the F1 generation.

F2 Generation: To find the ratio in the F2 generation, cross two F1 plants (Tt x Tt).

Using a Punnett square:The possible genotypes of the F2 generation are:TT (pure tall)Tt (tall)tt (short)The ratio of these genotypes will be:1 TT : 2 Tt : 1 ttSo, the ratio of pure tall (TT) plants to short (tt) plants in the F2 generation is 1:1.



Q. Which one of the following statements about variations is not true?

(a) Variation is minimum in asexual reproduction.
(b) All variations in a species have equal chances of survival.
(c) Changes in genetic constitution result in variation.
(d) Variants can be selected by environmental factors.

Ans B

(a) Variation is minimum in asexual reproduction: True. Asexual reproduction produces offspring that are genetically identical to the parent, resulting in minimal variation.

(b) All variations in a species have equal chances of survival: **Not true.** Not all variations have equal chances of survival; some variations may be more advantageous than others depending on environmental conditions and selective pressures.

(c) Changes in genetic constitution result in variation: True. Variations arise due to changes in the genetic material, either through mutations, recombination, or other genetic mechanisms.

(d) Variants can be selected by environmental factors: True. Environmental factors can influence which variants are more successful, leading to natural selection.

Species

Araschnia levana

Precis octavia

Bicyclus anynana

Q. While studying vegetation of an area, terms like 'population' and 'community' are often used. Which one of the following statements best describes a population?

(a) A group of organisms of one species, living in the same area at the same time.
(b)A group of organisms of one species living in different areas during different seasons.
(c)A unit consisting of biotic and abiotic components.
(d) A group of organisms of more than one species, living in the same area at the same time.

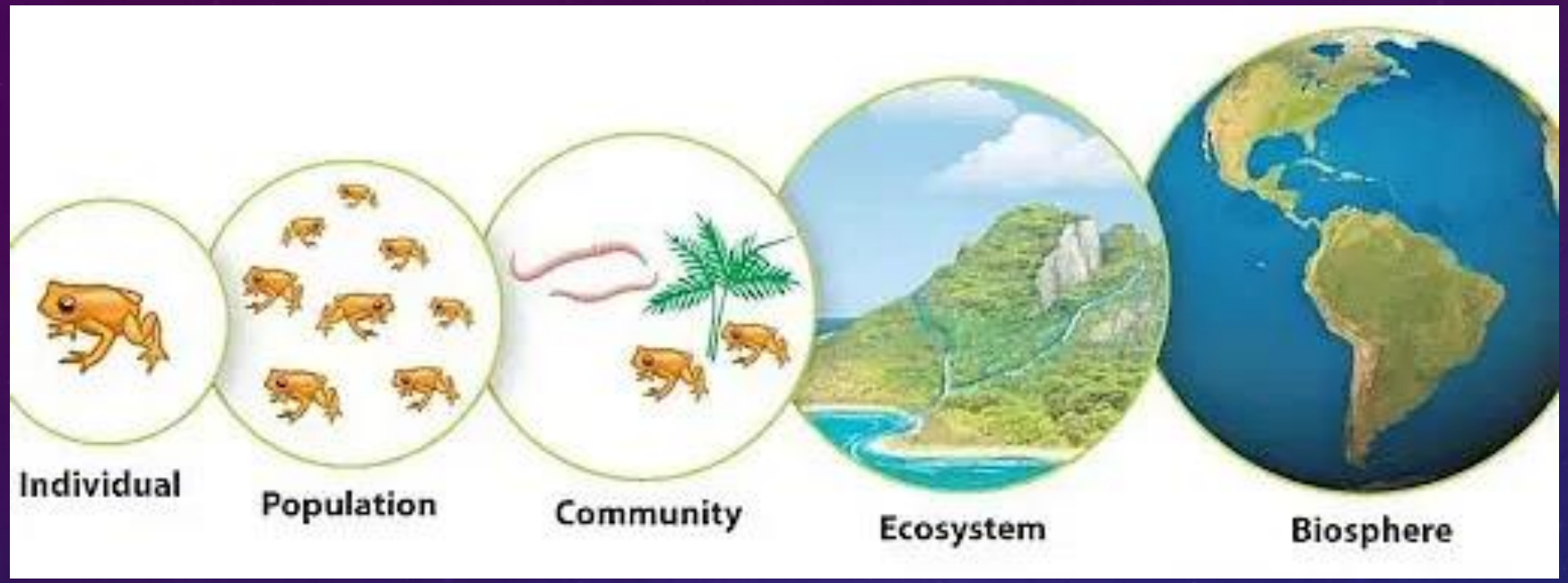
Ans A

(a) A group of organisms of one species, living in the same area at the same time: Correct. A population consists of individuals of the same species living in a particular area and interacting with one another.

(b) A group of organisms of one species living in different areas during different seasons: Incorrect. This describes a species' distribution rather than a population, which is defined by a specific area at a given time.

(c) A unit consisting of biotic and abiotic components: Incorrect. This describes an ecosystem, not a population. An ecosystem includes both living (biotic) and non-living (abiotic) components.

(d) A group of organisms of more than one species, living in the same area at the same time: Incorrect. This describes a community, not a population. A community consists of multiple species interacting in the same area.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. In the human body, blood flows through a process of double circulation. Which one of the following statements is true in this regard?

(a) Oxygenated blood reaches the left side of the heart from the lungs.
(b) Blood in the left side of the heart is poor in oxygen and is brought to the right side of the heart.
(c) Deoxygenated blood from the left side of the heart is brought to the lungs for oxygenation.
(d) Oxygenated blood from the right side of the heart is sent around the body.

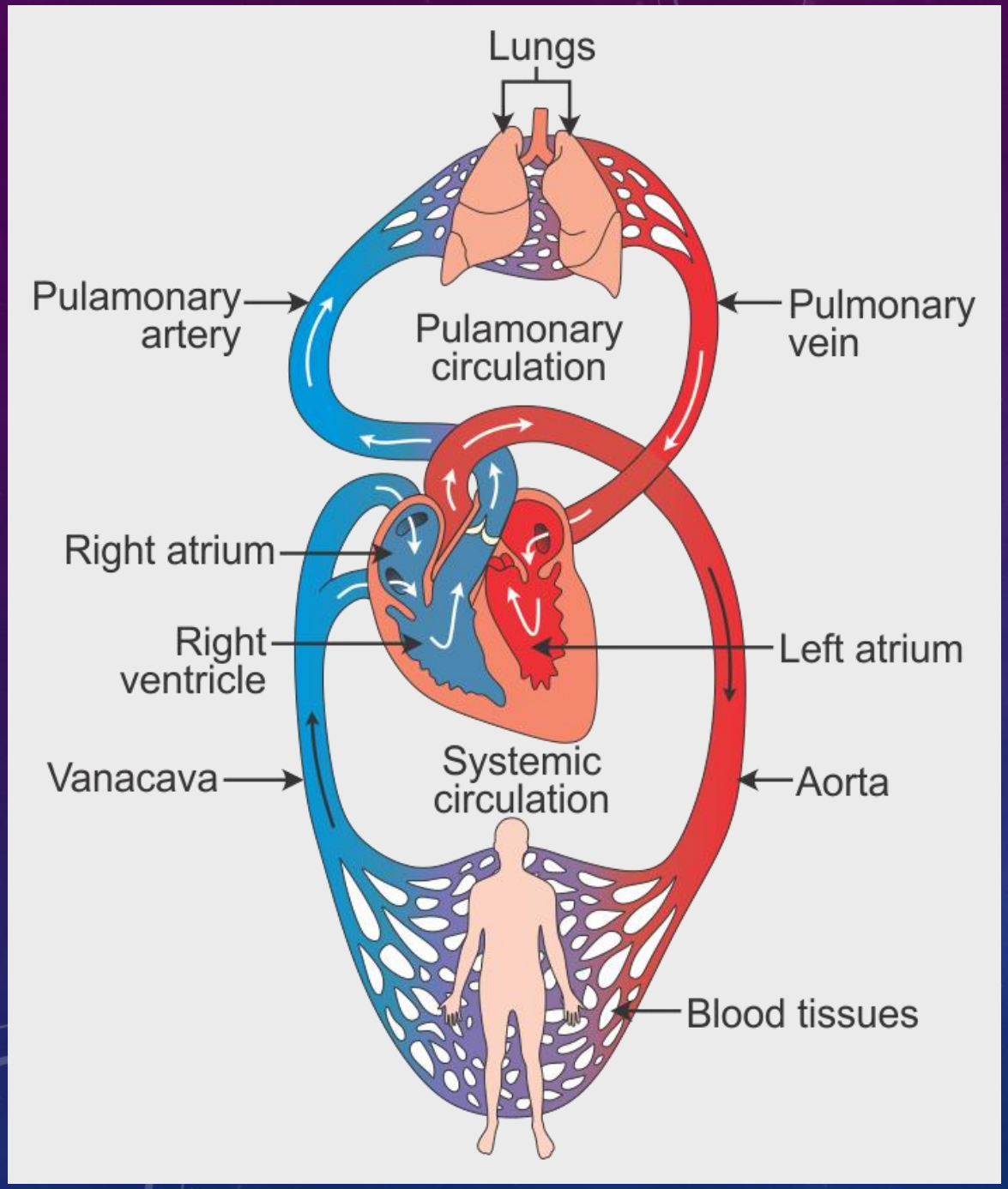
Ans A

(a) Oxygenated blood reaches the left side of the heart from the lungs: Correct. In double circulation, oxygenated blood from the lungs returns to the left side of the heart to be pumped to the rest of the body.

(b) Blood in the left side of the heart is poor in oxygen and is brought to the right side of the heart: Incorrect. Blood in the left side of the heart is oxygenated and is pumped to the rest of the body, not to the right side.

(c) Deoxygenated blood from the left side of the heart is brought to the lungs for oxygenation: Incorrect. Deoxygenated blood is sent from the right side of the heart to the lungs for oxygenation, not from the left side.

(d) Oxygenated blood from the right side of the heart is sent around the body: Incorrect. Oxygenated blood is sent from the left side of the heart to the body. The right side handles deoxygenated blood.



Q. In which of the following groups of organisms, is food material broken down outside the body and absorbed ?

(a) Yeast, mushroom, bread mould
(b) Mushroom, Amoeba, green plants
(c) Caserta, tapeworm, lice
(d) Paramecium, Amoeba, Caserta

Ans A

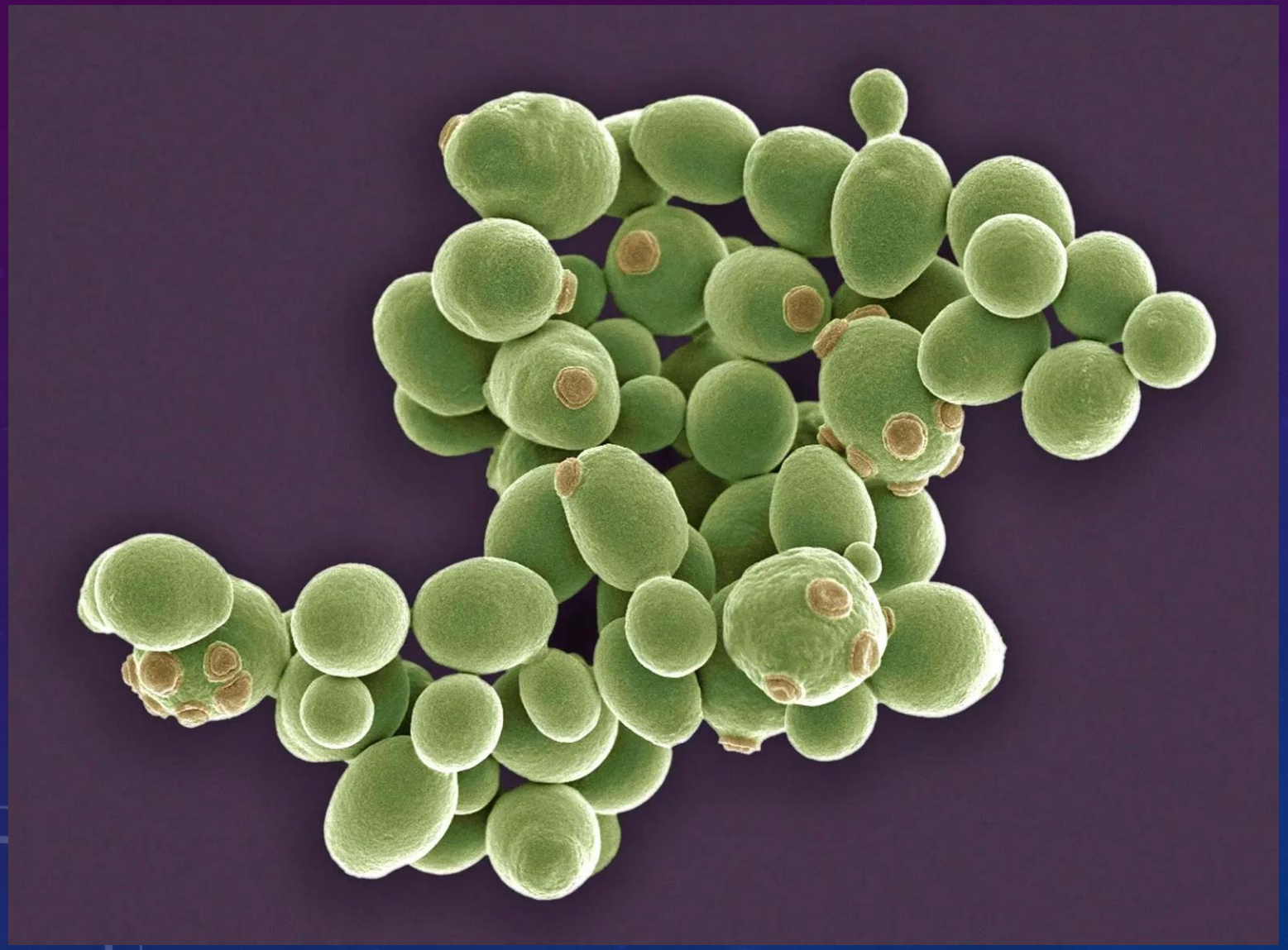
(a) Yeast, mushroom, bread mould: Correct. These organisms secrete digestive enzymes into their surroundings, break down food externally, and then absorb the nutrients. This process is known as extracellular digestion.

(b) Mushroom, Amoeba, green plants: Incorrect. While mushrooms perform extracellular digestion, amoebas engulf food and digest it internally within food vacuoles, and green plants produce their own food through photosynthesis.

(c) Caterpillar, tapeworm, lice: Incorrect. Caterpillars digest food internally, tapeworms absorb nutrients directly from the host's digestive tract, and lice feed on blood or other substances but do not digest food externally.

(d) Paramecium, Amoeba, Caterpillar: Incorrect. Paramecia and amoebas digest food internally in food vacuoles, and caterpillars digest food internally in their digestive system.

Yeast



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Mushroom

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Bread mould

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Q. Rupa and Sachin observed an animal in their school garden. Rupa called it an insect while Sachin identified it as an earthworm. Which one of the following characteristics confirms that it is an insect?

(a) The animal had jointed legs.
(b) Body of the animal had very little segmentation.
(c) Body of the animal was cylindrical.
(d) Body of the animal was bilaterally symmetrical.

Ans A

(a) The animal had jointed legs: Correct. Insects are characterized by having jointed legs, which is a key feature of the class Insecta.

(b) Body of the animal had very little segmentation: Incorrect. Insects have a more segmented body compared to earthworms, which have less pronounced segmentation.

(c) Body of the animal was cylindrical: Incorrect. Insects typically have a more segmented and less cylindrical body shape, while earthworms have a cylindrical body.

(d) Body of the animal was bilaterally symmetrical: Incorrect. While both insects and earthworms exhibit bilateral symmetry, this feature is not specific to insects alone.

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Animals which are marine, bilaterally symmetrical, have a coelom and a notochord, but never form a vertebral column are placed under which one of the following groups?

(a) Chordata
(b) Protochordata
(c) Vertebrata
(d) Mammalia

Ans B

(a) Chordata: Incorrect. While Chordata is the phylum that includes animals with a notochord, it encompasses both vertebrates and invertebrates.

(b) Protochordata: Correct. Protochordata is a subphylum within Chordata that includes animals like cephalochordates and urochordates (e.g., lancelets and tunicates). These animals have a notochord but do not develop a vertebral column.

(c) Vertebrata: Incorrect. Vertebrata is a subphylum of Chordata that includes animals with a vertebral column. Since the question specifies animals that never form a vertebral column, they are not classified here.

(d) Mammalia: Incorrect. Mammalia is a class within Vertebrata, specifically referring to mammals, which have a vertebral column.

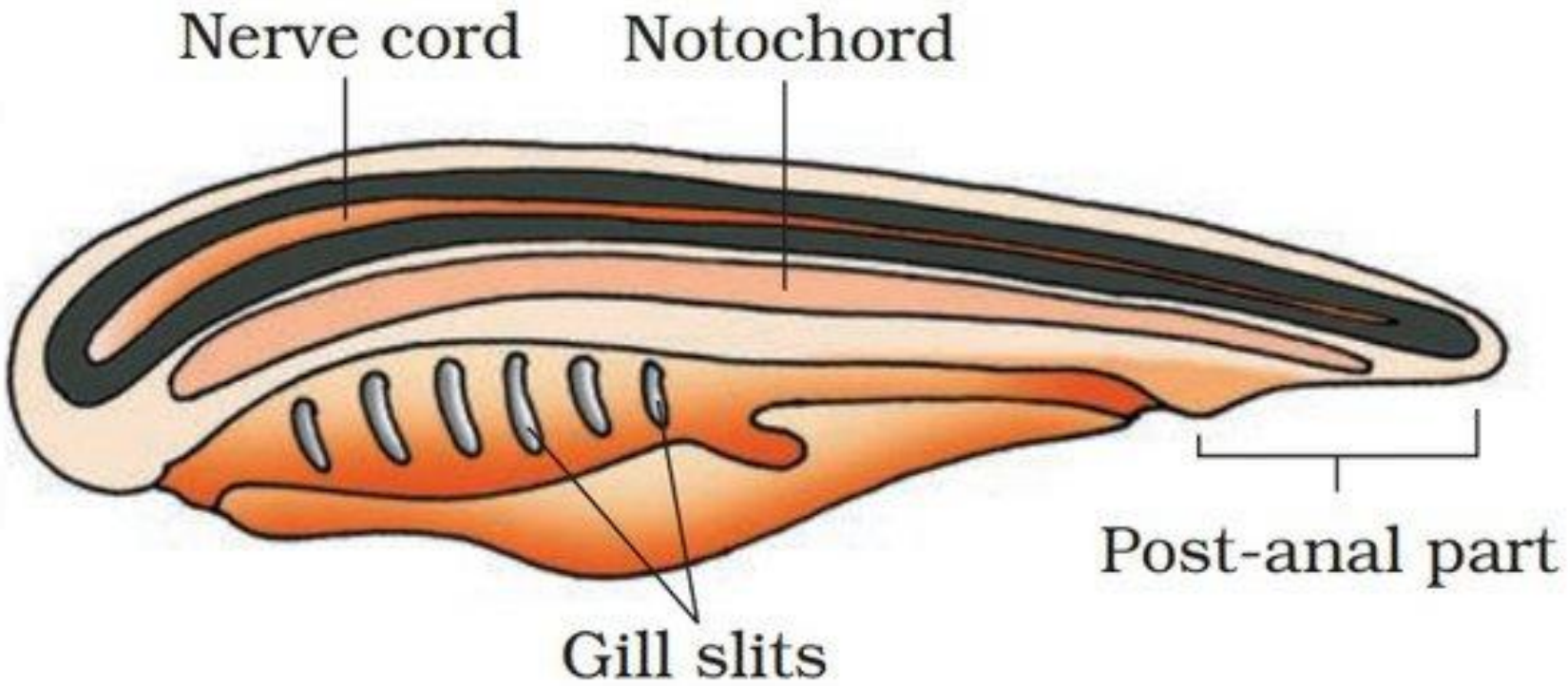
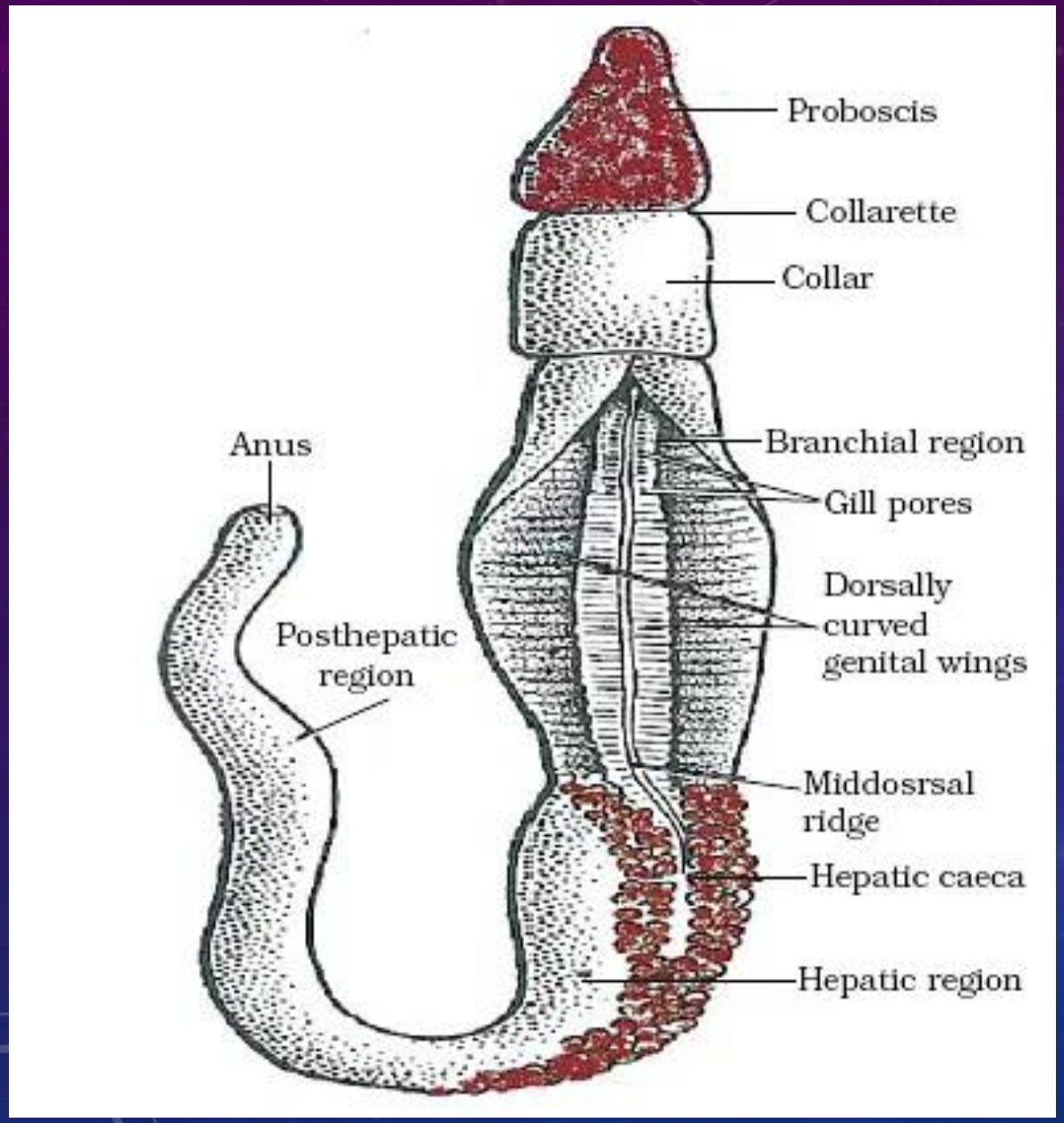


Figure 4.16 Chordata characteristics

Protochordata



Vertebrates

reptiles

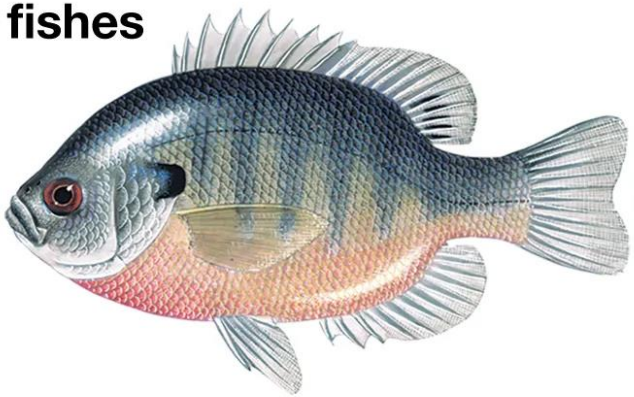
whale

mammals

birds

groundhog

fishes



amphibians

Q. In the human body, blood flows through a process of double circulation. Which one of the following statements is true in this regard?

(a) Oxygenated blood reaches the left side of the heart from the lungs.
(b) Blood in the left side of the heart is poor in oxygen and is brought to the right side of the heart.
(c) Deoxygenated blood from the left side of the heart is brought to the lungs for oxygenation.
(d) Oxygenated blood from the right side of the heart is sent around the body.

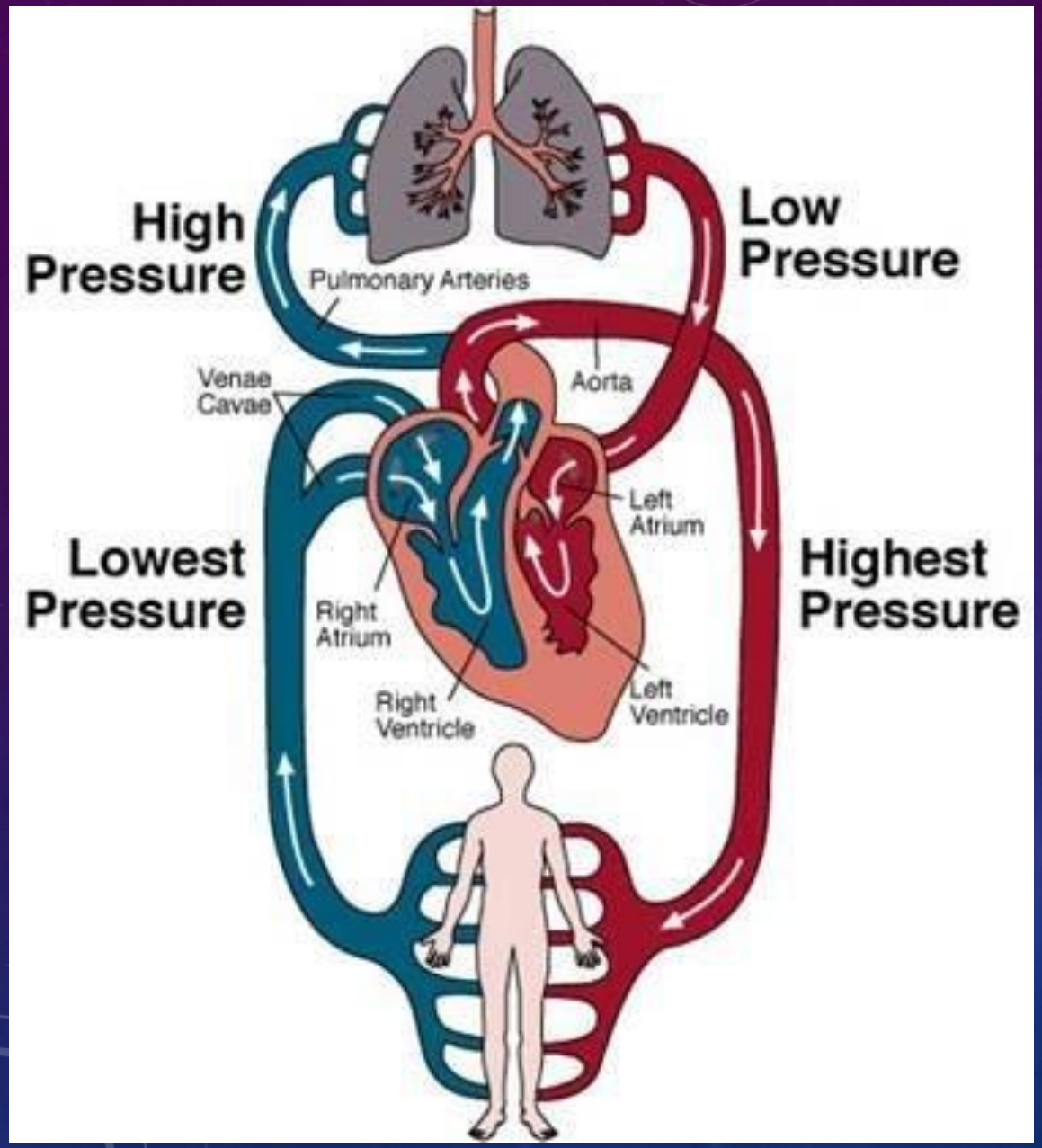
Ans A

(a) Oxygenated blood reaches the left side of the heart from the lungs: Correct. In double circulation, oxygenated blood returns from the lungs to the left side of the heart, where it is then pumped to the rest of the body.

(b) Blood in the left side of the heart is poor in oxygen and is brought to the right side of the heart: Incorrect. Blood in the left side of the heart is oxygenated. It is pumped to the body from the left side, while deoxygenated blood is received from the body into the right side of the heart.

(c) Deoxygenated blood from the left side of the heart is brought to the lungs for oxygenation: Incorrect. Deoxygenated blood is sent from the right side of the heart to the lungs for oxygenation.

(d) Oxygenated blood from the right side of the heart is sent around the body: Incorrect. Oxygenated blood is sent from the left side of the heart to the body. The right side handles deoxygenated blood.



TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

CDS 2022 (1 and 2) PYQs Biology

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Which one of the following statements is not correct with regard to genetically modified organisms?

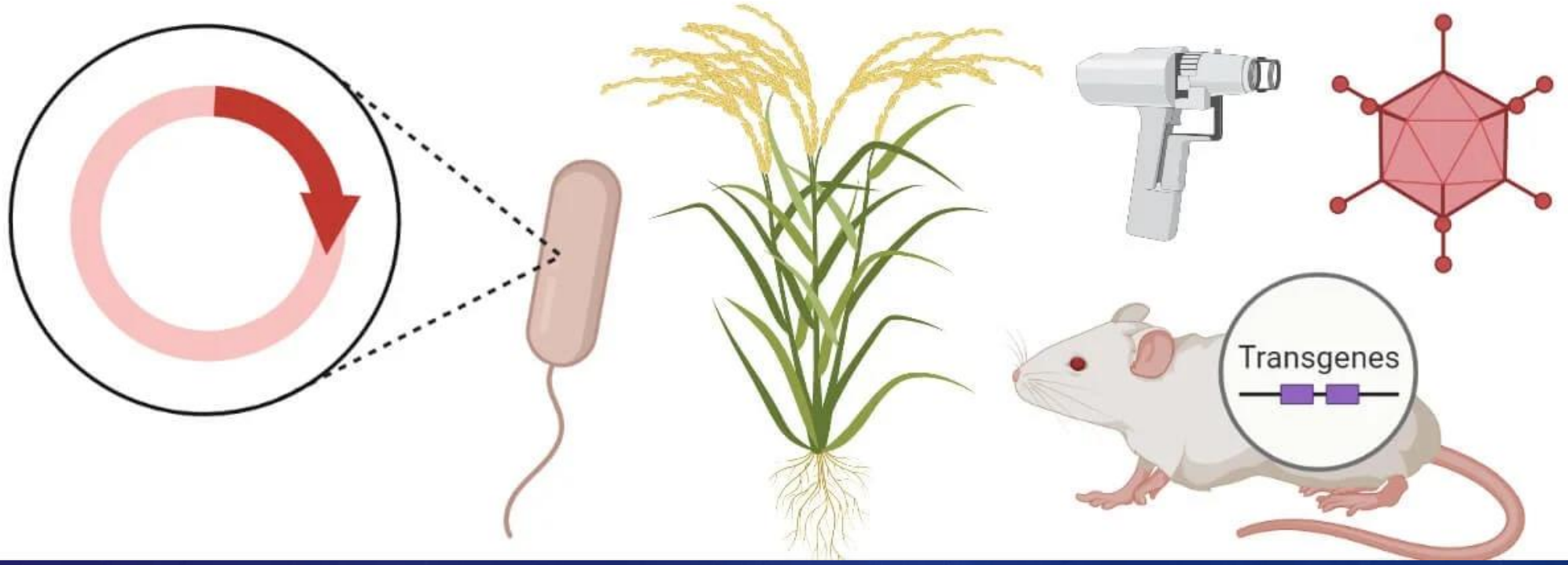
(a) In this technique a gene from one organism is isolated and transferred to the cell of another organism.
(b) This technique has applications only in plants.
(c) Genes for insect resistance may spread from crop plants to wild plants.
(d) To produce a transgenic animal the novel genes are inserted at a very early stage of development.

Ans B

(a) Correct: Genetically modified organisms (GMOs) involve isolating a gene from one organism and transferring it into another.
(b) Not Correct: GMOs have applications in both plants and animals, not just plants. Examples include genetically modified crops and transgenic animals.
(c) Correct: Genes for insect resistance can spread from GM crops to wild plants through cross-pollination.
(d) Correct: To produce a transgenic animal, novel genes are usually inserted at a very early stage of development, such as in embryos.

Genetically Modified Organism (GMO)

Bacteria, Plants, Animals, Viruses

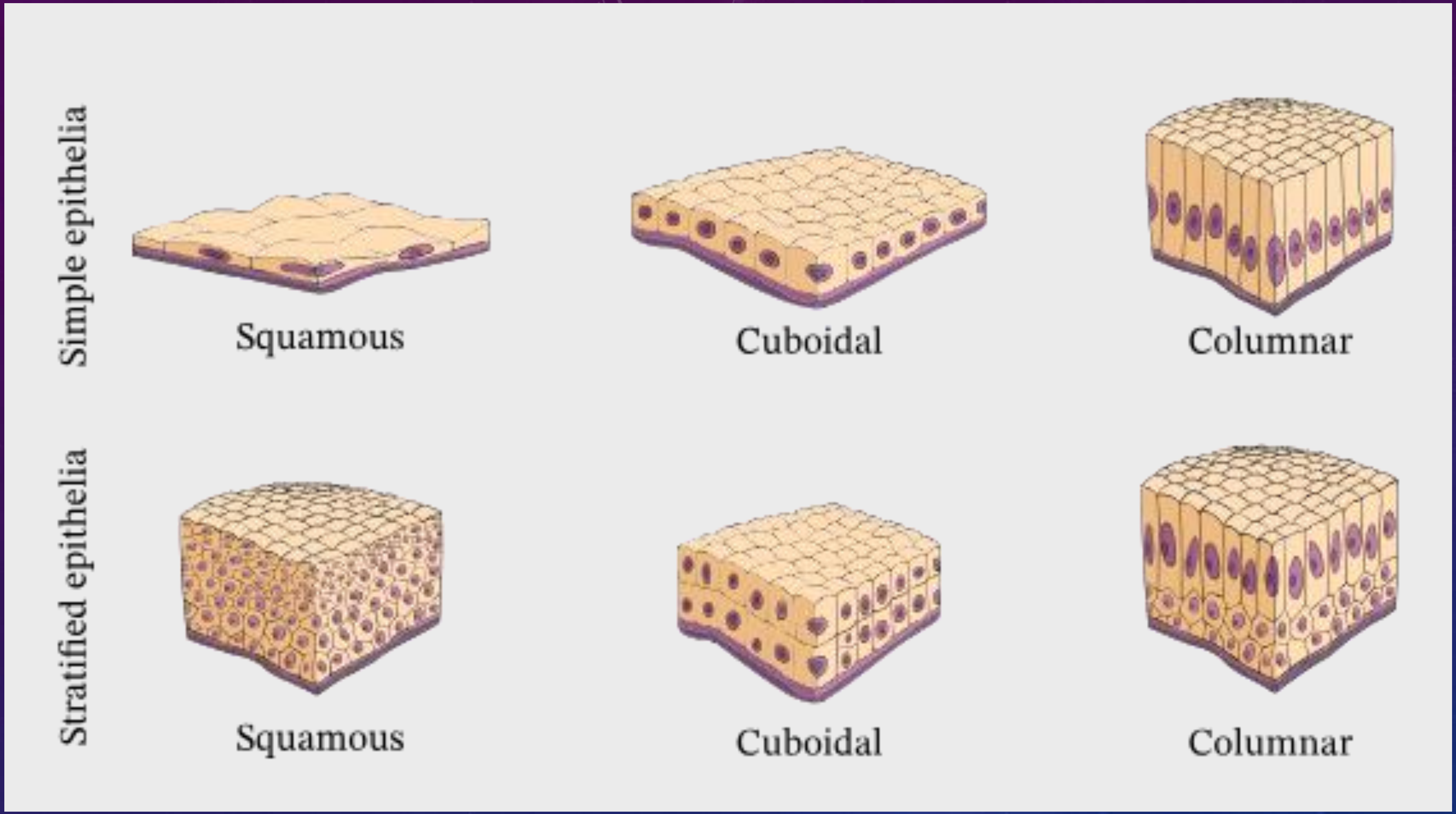


Q. Suppose, due to an accident, the delicate lining of the mouth and the oesophagus of a person is injured. In this case, which one of the following tissues will be affected?

(a) Smooth muscle
(b) Cuboidal epithelium
(c) Squamous epithelium
(d) Striated muscle

Ans C

(a) Smooth muscle: Found in the walls of internal organs (e.g., intestines, blood vessels), not in the mouth or oesophagus lining.
(b) Cuboidal epithelium: Typically found in glandular tissues and kidney tubules, not in the mouth or oesophagus lining.
(c) Squamous epithelium: This is the type of tissue that lines the mouth and oesophagus. It is thin and flat, suitable for protection and absorption.
(d) Striated muscle: Found in skeletal muscles, not in the mouth or oesophagus lining.


Simple epithelia
Squamous
Cuboidal
Columnar
Stratified epithelia
Squamous
Cuboidal
Columnar

Connective Tissue

Epithelial Tissue

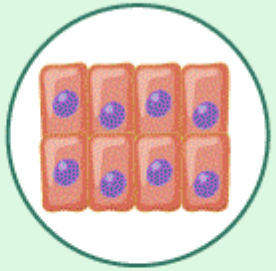
Muscle Tissue

Nervous Tissue

Types of Animal Tissue

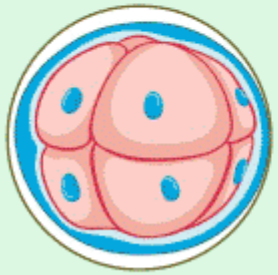
Blood

Bone Tissue

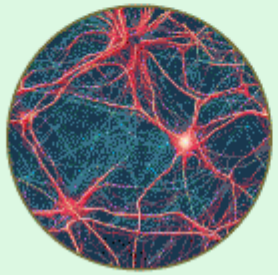


Epithelial Tissue

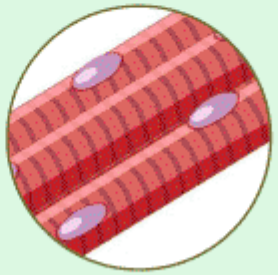
Cartilage Tissue



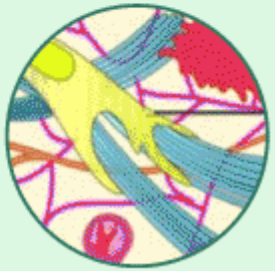
Adipose Tissue



Nervous Tissue



Muscle Tissue



Connective Tissue

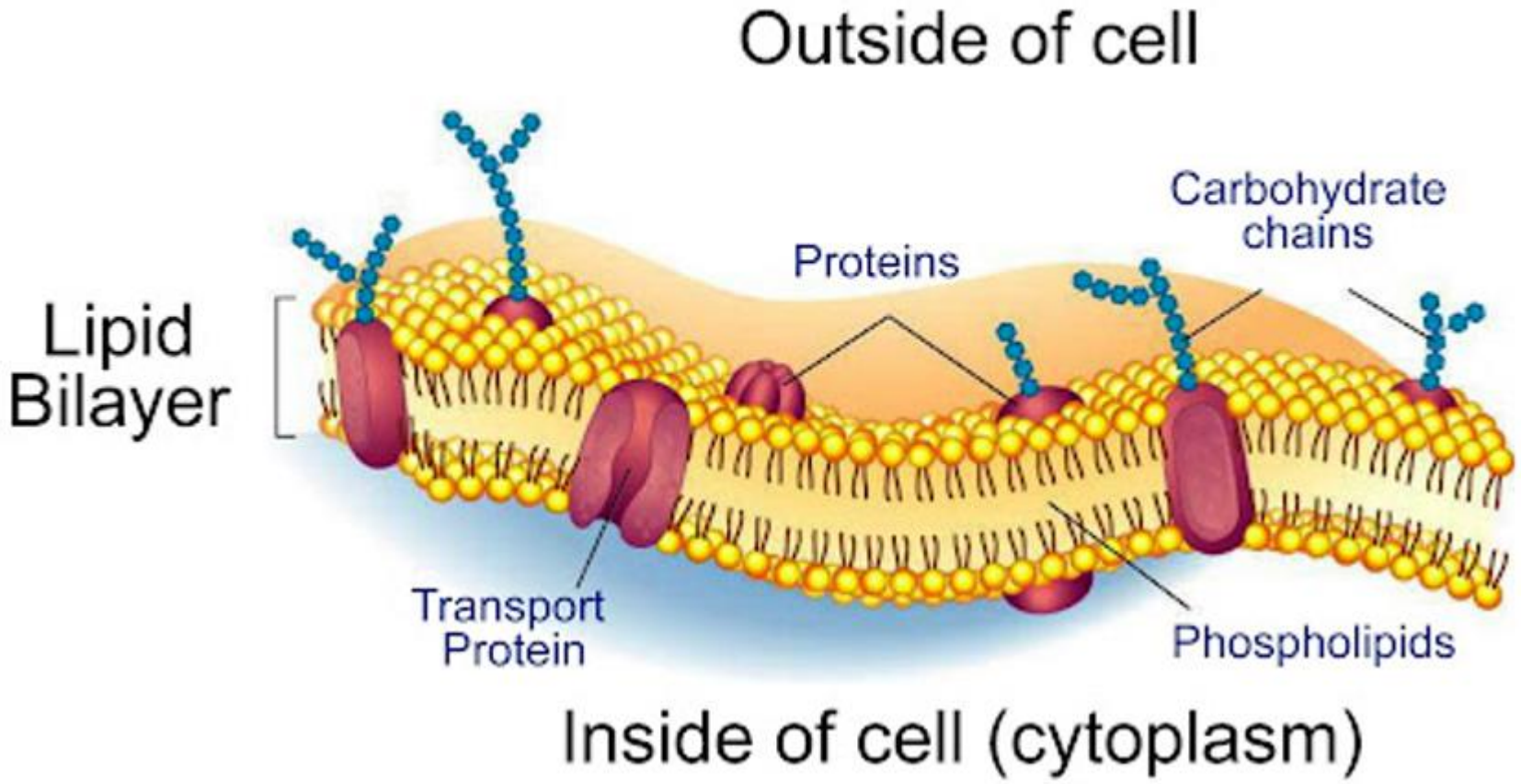
Q. Which one of the following statements is correct about the cell membrane?

(a) It is made up of cellulose.
(b) It is a permeable structure for all substances.
(c) It is flexible and enables the cell to engulf many materials.
(d) It does not allow diffusion of gases like oxygen and carbon dioxide.

Ans C

(a) Not Correct: The cell membrane is not made of cellulose; it is primarily composed of a phospholipid bilayer with embedded proteins.
(b) Not Correct: The cell membrane is selectively permeable, meaning it allows some substances to pass through while blocking others.
(c) Correct: The cell membrane is flexible and allows the cell to engulf materials through processes like endocytosis.
(d) **Not Correct**: The cell membrane does allow the diffusion of gases like oxygen and carbon dioxide.

Structure of the Cell Membrane

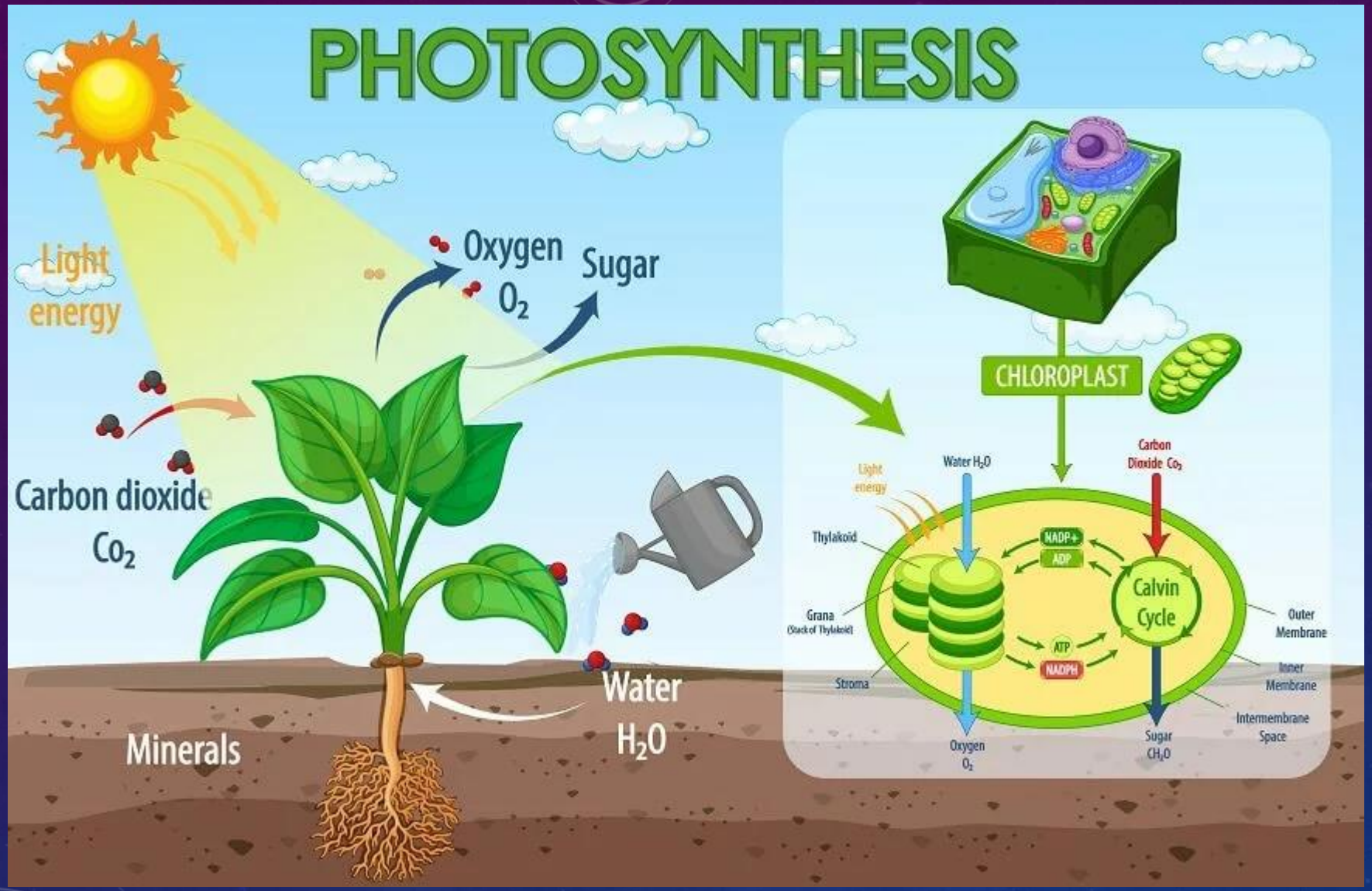


Q. Plants prepare glucose in the process of:

(a) respiration
(b) photosynthesis
(c) degradation
(d) mineral absorption

Ans B

(a) Respiration: This is the process where glucose is broken down to release energy, not where glucose is prepared.
(b) Photosynthesis: This is the process by which plants convert sunlight, carbon dioxide, and water into glucose and oxygen.
(c) Degradation: This refers to the breakdown of substances, not the creation of glucose.
(d) Mineral absorption: This involves taking up minerals from the soil, not producing glucose.



TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. The disease rickets develops in children due to the deficiency of:

(a) Vitamin C
(b) Vitamin D
(c) Vitamin A
(d) Vitamin B

Ans B

(a) Vitamin C: Deficiency leads to scurvy, not rickets.
(b) Vitamin D: Deficiency causes rickets, which results in weak or soft bones in children.
(c) Vitamin A: Deficiency leads to vision problems and immune issues, not rickets.
(d) Vitamin B: There are various B vitamins, but deficiencies generally cause other health issues, not rickets.

Different Types of Vitamins

Vitamins	Scientific Name	Source	Functions	Deficiency Disease
Vitamin A	Retinol	Carrot, green vegetables	Healthy Vision, Boost Immune system	Xerophthalmia (Night Blindness)
Vitamin B	B-Complex	Animal and dairy products	DNA Replication, Produce RBCs	Muscle and Body Weakness
Vitamin C	Ascorbic Acid	Citrus fruits, Berries & Tomato	Anti-oxidant, Formation of iron	Scurvy, Anemia
Vitamin D	Calciferol	Fish, Egg yolk & Cheese	Bone Growth	Rickets, Osteoporosis
Vitamin E	Tocopherol	Almond, Peanut & soyabeans	Anti-oxidant, Boost Immune System	Neuropathy, Anemia
Vitamin K	Phylloquinone	Green leafy vegetables	Blood Coagulation	Hemorrhagic diseases

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Match List I with List II and select the correct answer using the code given below the lists:

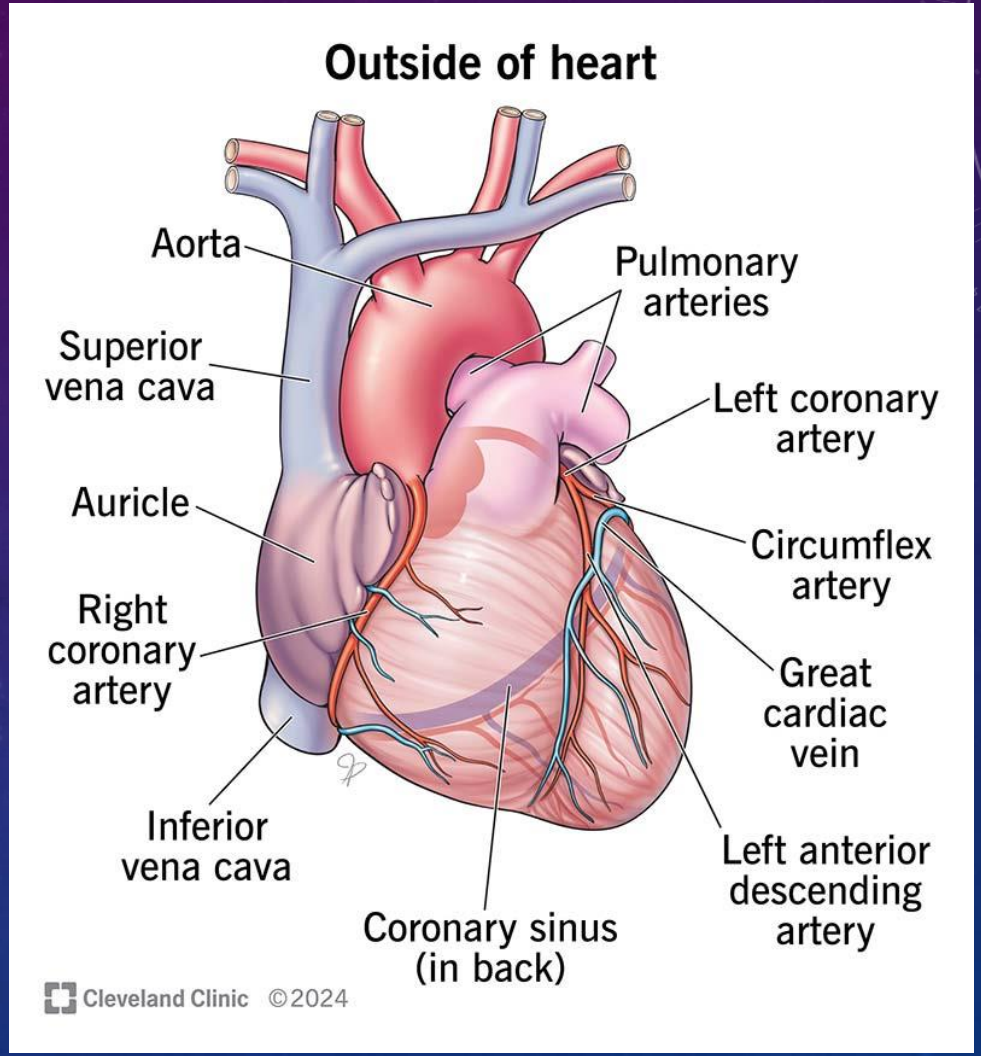
List I (Blood Vessel)	List II (Function)
A. Pulmonary artery	1. Carries blood from lungs to heart
B. Capillaries	2. Carries blood to heart muscle
C. Coronary artery	3. Connection between arteries and veins
D. Pulmonary vein	4. Carries blood from heart to lungs

Code :

	A	B	C	D
(a)	4	3	2	1
(b)	4	2	3	1
(c)	1	2	3	4
(d)	1	3	2	4

Ans A

Pulmonary Artery: From heart to lungs (deoxygenated blood).
Pulmonary Vein: From lungs to heart (oxygenated blood).
Coronary Arteries: Supply blood to the heart muscle.
Coronary Veins: Drain blood from the heart muscle.



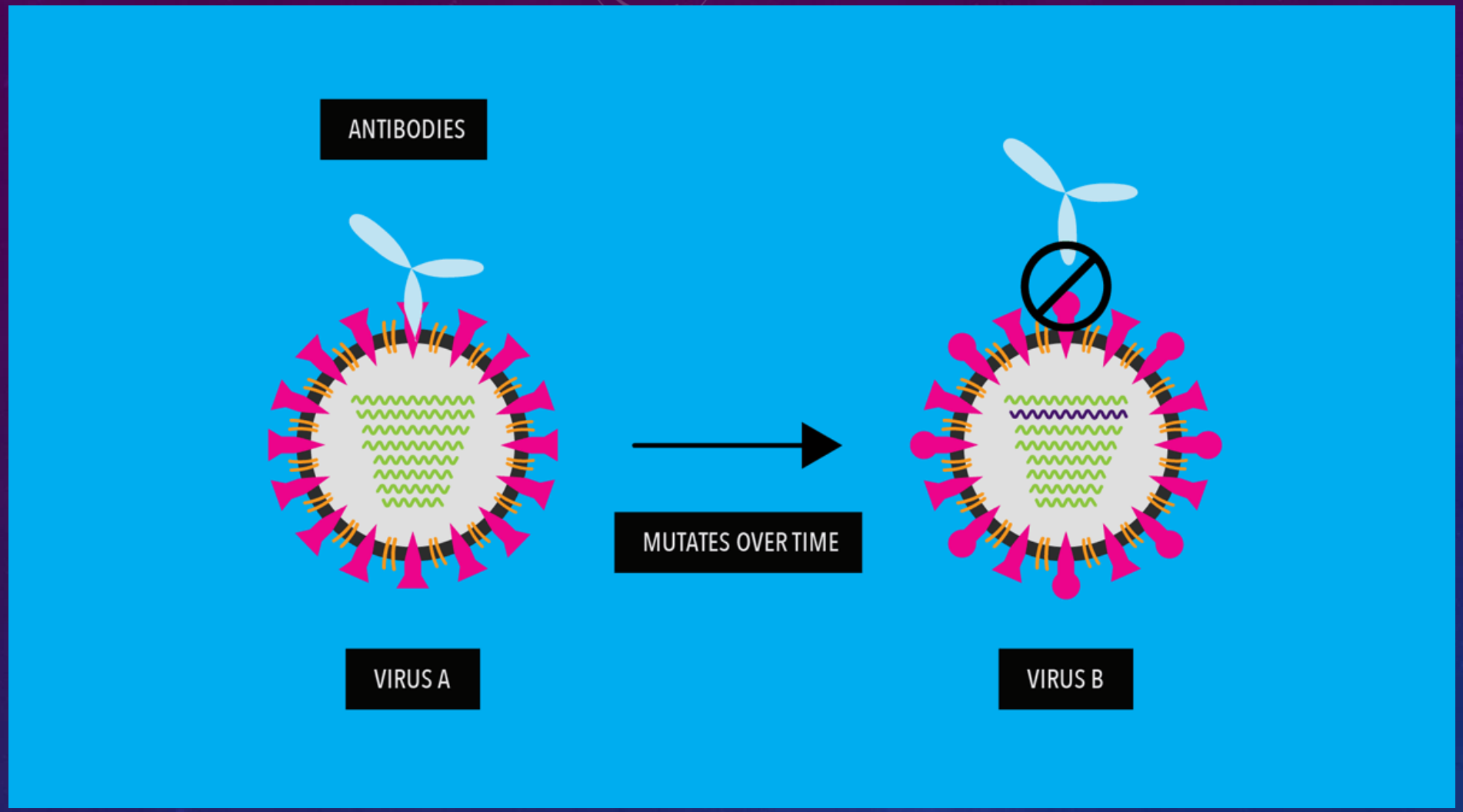
Arteries: Carry oxygen-rich blood away from the heart to various tissues and organs.
Structure: Thick, elastic walls to withstand high pressure from the heart's pumping action.
Veins: Return oxygen-poor blood back to the heart from the tissues and organs.
Structure: Thinner walls compared to arteries, with valves to prevent backflow of blood due to lower pressure.
Capillaries: Facilitate the exchange of oxygen, nutrients, and waste products between the blood and tissues.
Structure: Very thin walls (one cell layer thick) to allow efficient exchange.

Q. Mutation in a virus is caused due to a change in its :

(a) cell size.
(b) genetic material.
(c) shape.
(d) colour.

Ans B

(a) Cell size: Mutation does not typically affect cell size; it's related to changes in genetic material.
(b) Genetic material: This is correct. Mutations in viruses are caused by changes in their genetic material (DNA or RNA), leading to alterations in the virus's characteristics.
(c) Shape: While mutations can affect the shape of a virus, the underlying cause is a change in genetic material, not the shape itself.
(d) Colour: Viruses do not have color in the traditional sense, and mutations are not related to color changes.

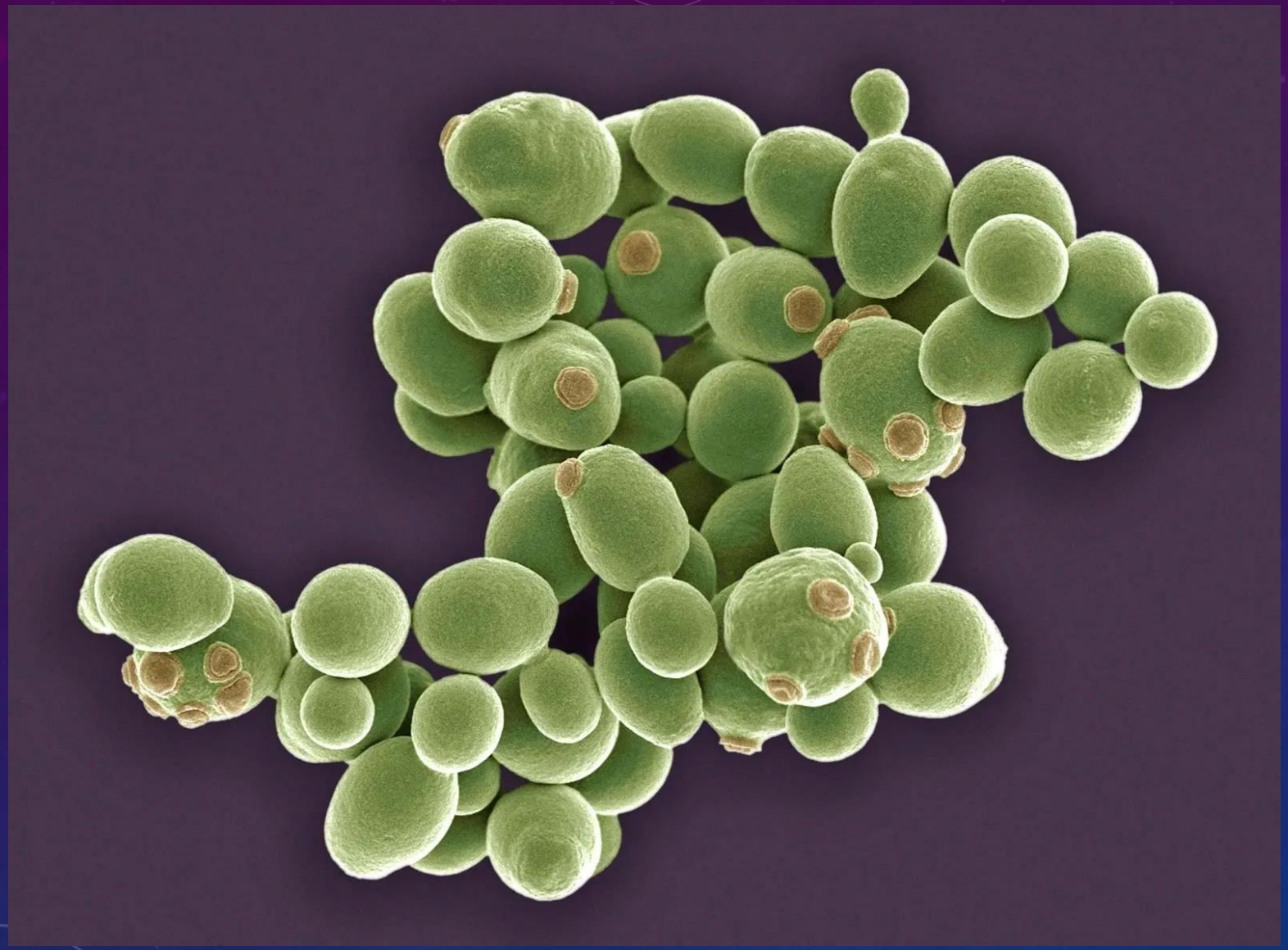


Q. Yeast, which is used to make bread, belongs to the group:

(a) Protista
(b) Fungi
(c) Monera
(d) Protozoa

Ans B

(a) Protista: This group includes mostly single-celled organisms like algae and protozoa, not yeast.
(b) Fungi: This is correct. Yeast is a type of fungus, and fungi are used in baking and fermentation.
(c) Monera: This group includes bacteria and archaea, not yeast.
(d) Protozoa: This group includes single-celled, animal-like organisms, not yeast.



TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. Hyphae are:

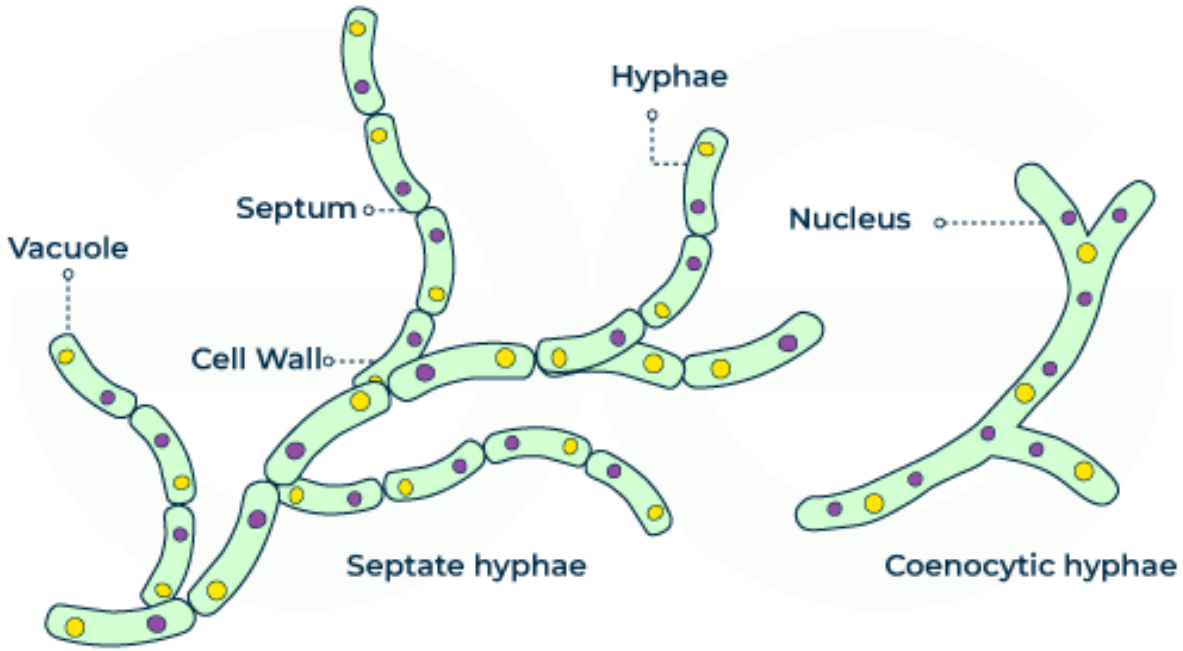
(a) produced by yeast.
(b) thin threads formed by many fungi.
(c) reproductive cells.
(d) responsible for preventing the cell from losing water in wet conditions.

- Hyphae are the thread-like structures that form the body of multicellular fungi.
- They secrete enzymes to break down nutrients from their food source and absorb these nutrients for growth.
- Each hypha has a sturdy cell wall composed of chitin.
- Growing from their tips, hyphae extend to find additional food sources and can branch extensively, forming an intricate network known as mycelium.

Ans B

(a) Produced by yeast: Not correct. Yeast typically consists of single cells and does not have hyphae.
(b) Thin threads formed by many fungi: Correct. Hyphae are the thread-like structures that make up the body of many fungi.
(c) Reproductive cells: Not correct. Reproductive cells in fungi are usually spores, not hyphae.
(d) Responsible for preventing the cell from losing water in wet conditions: Not correct. This function is related to structures like cell walls or cuticles, not hyphae.

Hyphae of fungi



CDS 2 2022

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. In plant cells

(a) Nucleus does not need a membrane but chloroplasts are surrounded by their own membrane.
(b) Nucleus and chloroplasts are surrounded separately by their own membrane.
(c) Nucleus is surrounded by membrane but chloroplasts do not need membrane.
(d) Both nucleus and chloroplasts are not surrounded by any membrane.

Ans B

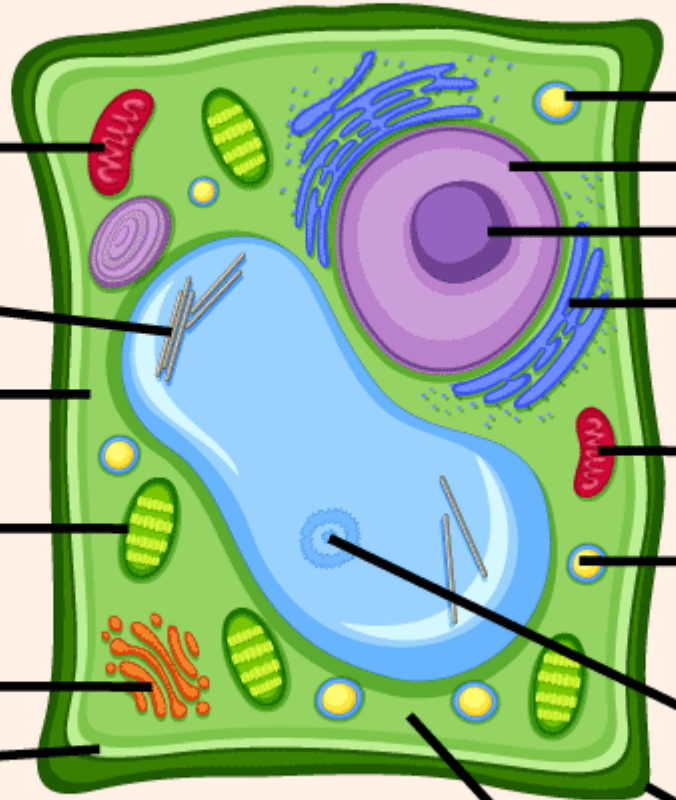
(a) Nucleus does not need a membrane but chloroplasts are surrounded by their own membrane: Not correct. The nucleus has a membrane, and chloroplasts are also surrounded by their own membrane.

(b) Nucleus and chloroplasts are surrounded separately by their own membrane: Correct. The nucleus is surrounded by a nuclear envelope (a double membrane), and chloroplasts have their own double membrane.

(**c) Nucleus is surrounded by a membrane but chloroplasts do not need membrane**: Not correct. Both the nucleus and chloroplasts are surrounded by their own membranes.

(d) Both nucleus and chloroplasts are not surrounded by any membrane: Not correct. Both the nucleus and chloroplasts are surrounded by membranes.

Plant Cell



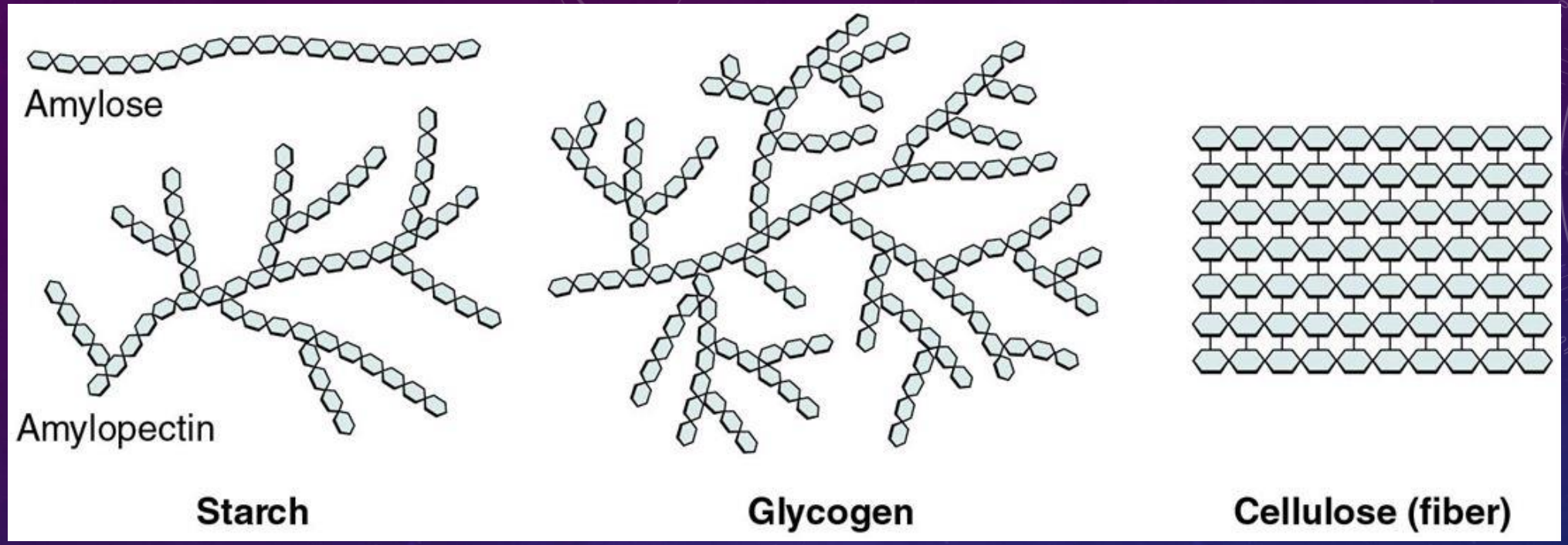
Amyloplast
Raphide crystal
Vacuole
Chloroplast
Golgi Complex
Cell membrane
Peroixsome
Nucleus
Nucleolus
Endoplasmic Reticulum
Mitochonrion
Ribosome
Druse crystal
Cell Wall
Cytoplsm

Q. Which one of the following statements about starch and glycogen is correct?

(a) Both starch and glycogen are found in plant cells.
(b) Both starch and glycogen are found in animal cells.
(c) Starch is present in plant cells and glycogen is present in animal cells.
(d) Both starch and glycogen are present in plant cells as well as animal cells.

Ans C

(a) Both starch and glycogen are found in plant cells: Not correct. Starch is found in plant cells, but glycogen is not.
(b) Both starch and glycogen are found in animal cells: Not correct. Glycogen is found in animal cells, but starch is not.
(c) Starch is present in plant cells and glycogen is present in animal cells: Correct. Starch serves as the main storage form of carbohydrates in plants, while glycogen is the primary storage form in animals.
(d) Both starch and glycogen are present in plant cells as well as animal cells: Not correct. Starch is present in plant cells, and glycogen is present in animal cells, but not both in both types of cells.



Q. Which one of the following statements about the process of photosynthesis is correct?

(a) Light energy is directly converted to kinetic energy which oxidizes carbon dioxide.
(b) Light energy is directly converted to chemical energy which causes reduction of water.
(c) Chlorophyll absorbs the chemical energy of light which causes oxidation of carbon dioxide.
(d) Chlorophyll absorbs light energy which causes splitting of water molecules and reduction of carbon dioxide.

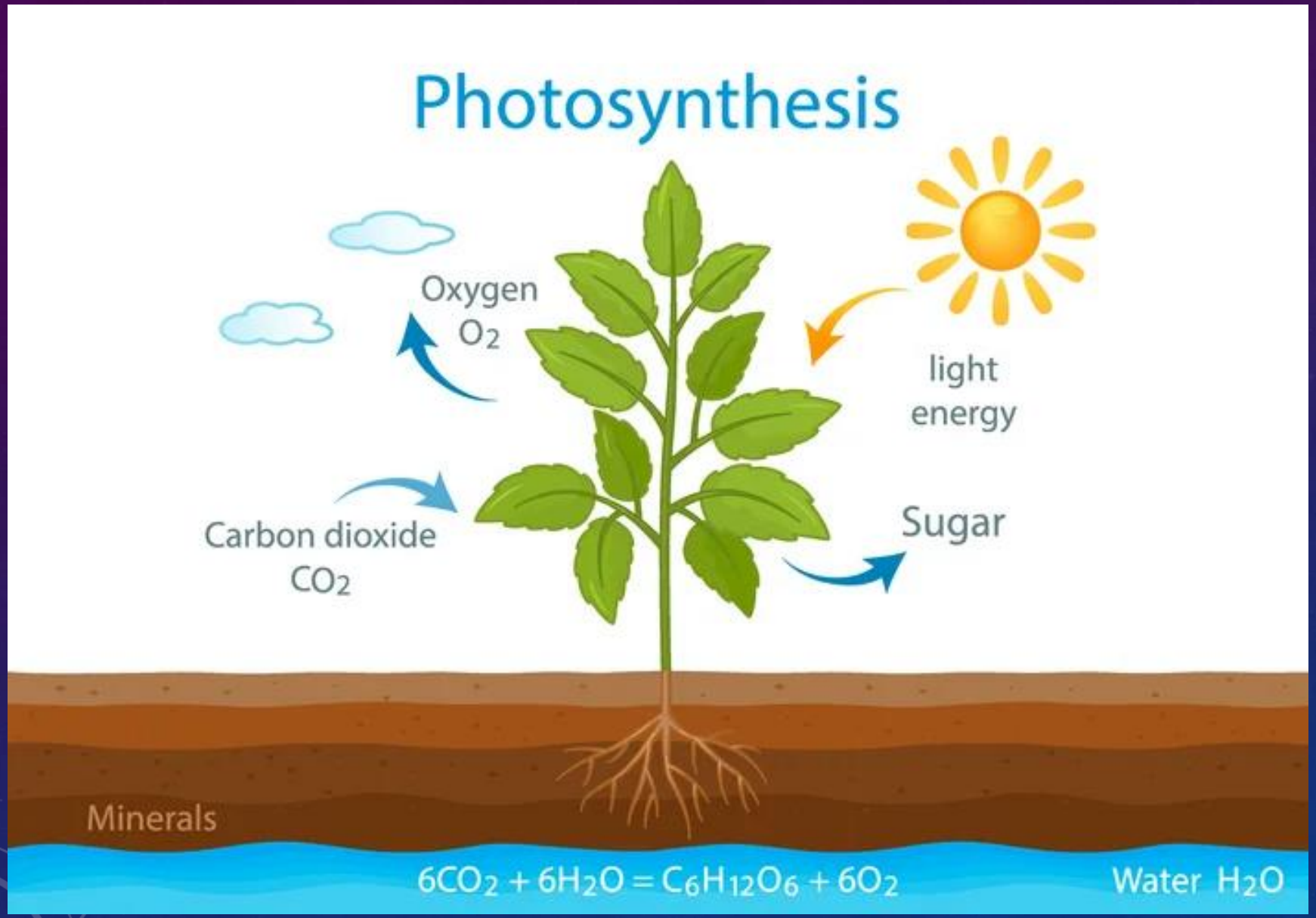
Ans D

(c) Chlorophyll absorbs the chemical energy of light which causes oxidation of carbon dioxide: Not correct. Chlorophyll absorbs light energy, not chemical energy, and it is involved in the reduction of carbon dioxide, not oxidation.

(d) Chlorophyll absorbs light energy which causes splitting of water molecules and reduction of carbon dioxide: Correct. Chlorophyll absorbs light energy, which drives the splitting of water molecules (photolysis) and the reduction of carbon dioxide to form glucose.

(a) Light energy is directly converted to kinetic energy which oxidizes carbon dioxide: Not correct. Light energy is converted to chemical energy, not kinetic energy, and the process involves the reduction of carbon dioxide rather than oxidation.

(b) Light energy is directly converted to chemical energy which causes reduction of water: Not correct. Light energy is converted to chemical energy, but it causes the splitting of water (oxidation of water), not the reduction of water.



Q. Kwashiorkor, a form of malnutrition, is caused by the deficiency of

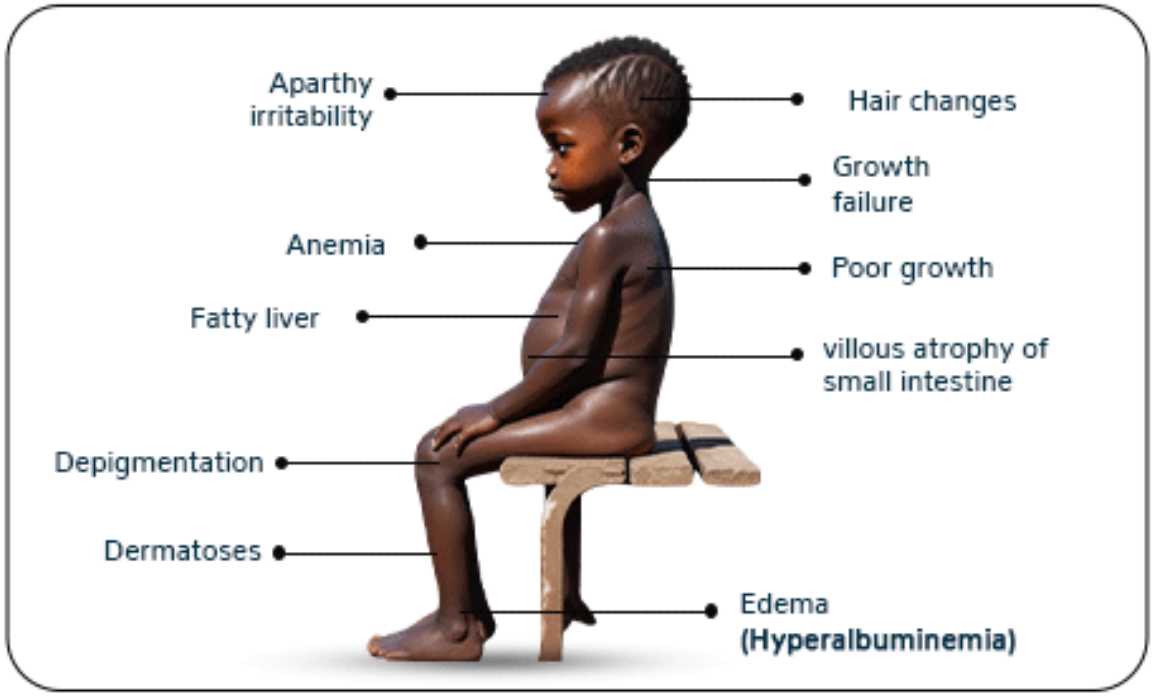
(a) Minerals
(b) Vitamins
(c) Fats
(d) Proteins

Ans D

(a) Minerals: Deficiencies in minerals can cause various health issues, but not specifically Kwashiorkor.
(b) Vitamins: Vitamin deficiencies can lead to conditions like scurvy or rickets, but Kwashiorkor is not caused by a lack of vitamins.
(c) Fats: While a lack of fats can lead to malnutrition, Kwashiorkor is specifically due to protein deficiency, not fat.
(d) Proteins: Correct. Kwashiorkor is a type of malnutrition caused by a severe deficiency of proteins in the diet, leading to symptoms such as edema and a distended abdomen.

Kwashiorkor : Symptoms & Signs

Normal



Kwashiorkor

Q. Which one of the following pairs of enzymes do not work at acidic pH?

(a) Trypsin and Pepsin
(b) Chymotrypsin and Pepsin
(c) Trypsin and Amylase
(d) Pepsin and Amylase

Ans C

(c) Trypsin and Amylase:

Trypsin: Works best at a slightly alkaline pH (around 8) in the small intestine.

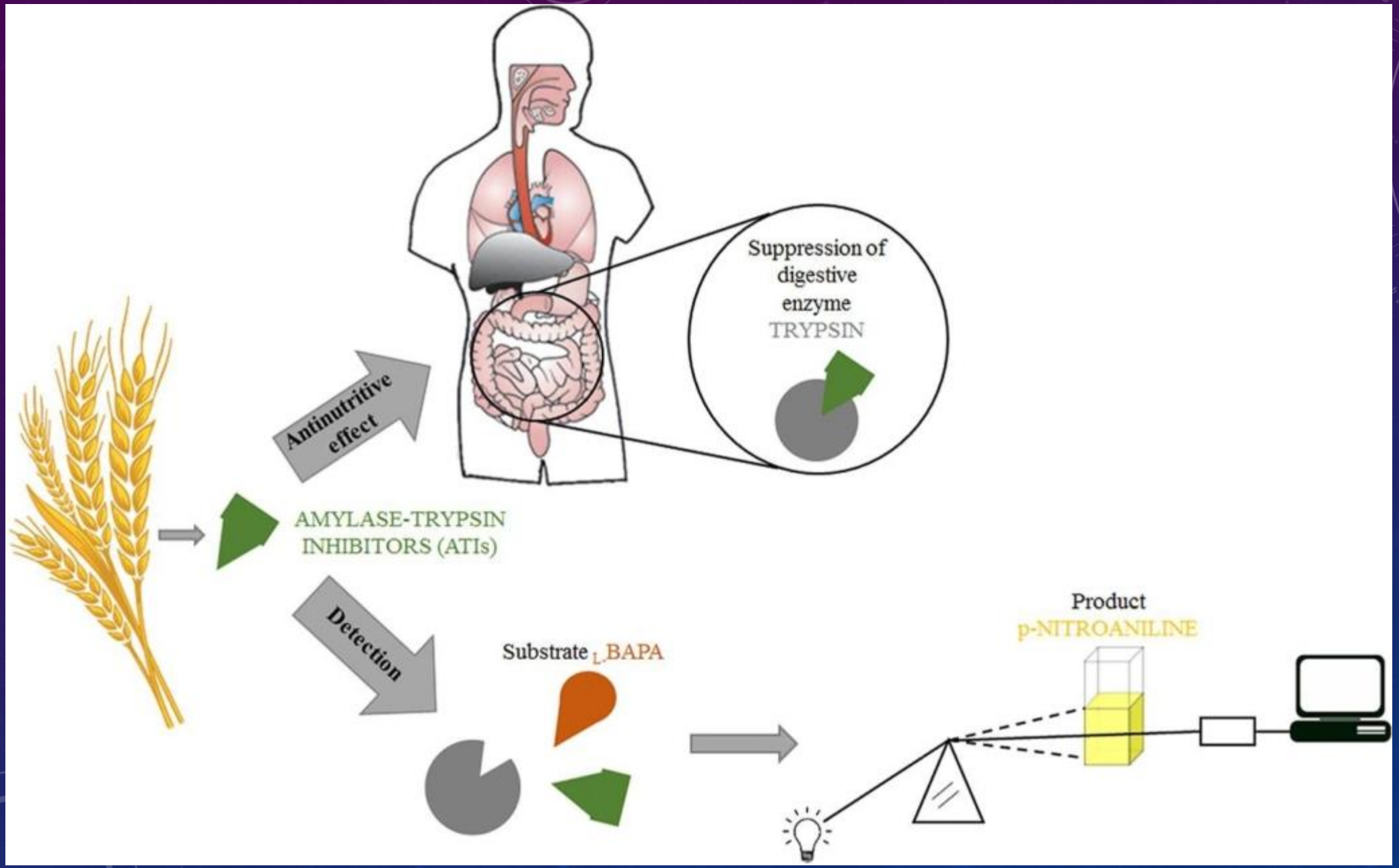
Amylase: In humans, salivary amylase works best at a slightly acidic to neutral pH (around 6.7 to 7) in the mouth, while pancreatic amylase works in the alkaline environment of the small intestine.

This pair includes enzymes that do not work well in acidic pH.

(d) Pepsin and Amylase:

Pepsin: Works well in acidic pH (around 1.5 to 2).

Amylase: As noted, salivary amylase works at a slightly acidic to neutral pH, but not in highly acidic conditions.



Q. Urea is produced by metabolism of

(a) Proteins
(b) Carbohydrates
(c) Lipids
(d) Both Proteins and Carbohydrates

Ans A

(a) Proteins: Correct. Urea is primarily produced from the metabolism of proteins. When proteins are broken down, amino acids are deaminated (removal of the amino group), and the resulting ammonia is converted to urea in the liver to be safely excreted.

(b) Carbohydrates: Not correct. Carbohydrates are broken down into sugars and do not directly produce urea.

(c) Lipids: Not correct. Lipids are metabolized into fatty acids and glycerol, and do not directly produce urea.

(d) Both Proteins and Carbohydrates: Not correct. Urea is specifically produced from protein metabolism, not carbohydrates.

Amylase

•**Function**: Breaks down carbohydrates (starches) into simple sugars.

•**Location**: Saliva (salivary amylase) and pancreas (pancreatic amylase).

2. Lipase

•**Function**: Breaks down fats into fatty acids and glycerol.

•**Location**: Pancreas (pancreatic lipase), stomach (gastric lipase), and saliva (lingual lipase).

3. Pepsin

•**Function**: Breaks down proteins into smaller peptides.

•**Location**: Stomach (produced as pepsinogen and activated by stomach acid).

4. Trypsin

•**Function**: Further digests proteins into smaller peptides and amino acids.

•**Location**: Pancreas (produced as trypsinogen and activated in the small intestine).

5. Chymotrypsin

•**Function**: Breaks down proteins into peptides.

•**Location**: Pancreas (also produced as a precursor and activated in the small intestine).

6. Lactase

•**Function**: Breaks down lactose, the sugar found in milk, into glucose and galactose.

•**Location**: Small intestine (produced by the brush border cells).

7. Sucrase

•**Function**: Breaks down sucrose (table sugar) into glucose and fructose.

•**Location**: Small intestine.

8. Maltase

•**Function**: Breaks down maltose into two glucose molecules.

•**Location**: Small intestine.

9. DNA Polymerase

•**Function**: Synthesizes new strands of DNA during cell replication.

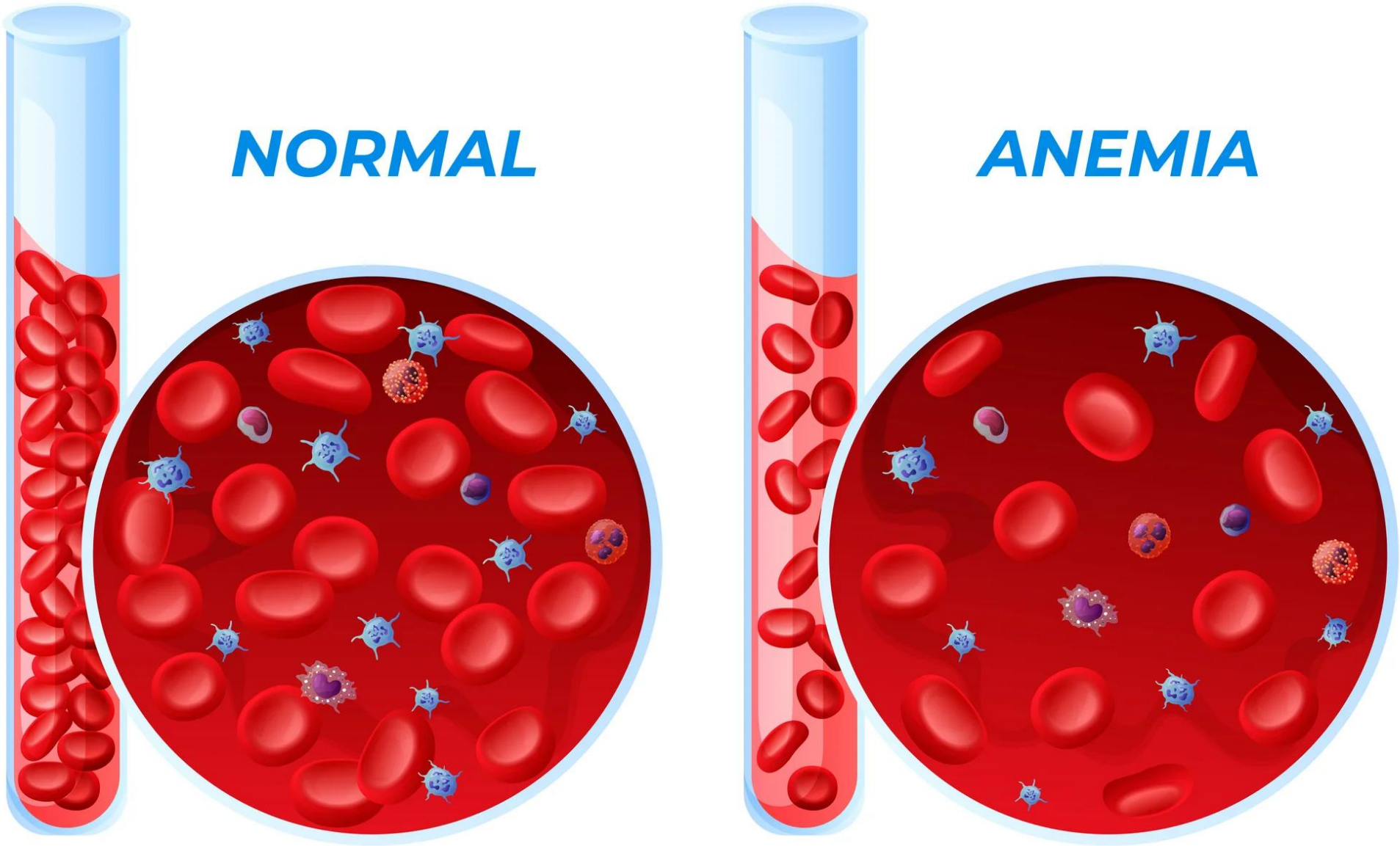
•**Location**: Nucleus of cells.

Q. Deficiency of iron causes

(a) Anaemia
(b) Scurvy
(c) Rickets
(d) Cholera

Ans A

Anemia: A condition characterized by a deficiency of red blood cells or hemoglobin, leading to fatigue and weakness.
Scurvy: A disease caused by a deficiency of vitamin C, leading to symptoms like bleeding gums, bruising, and joint pain.
Rickets: A condition in children caused by a deficiency of vitamin D, calcium, or phosphate, leading to soft and weak bones.
Cholera: An infectious disease caused by the bacterium Vibrio cholerae, leading to severe diarrhea and dehydration.



Q. Fat in human body is stored in

(a) Adipose tissue
(b) Red blood cells
(c) Muscle tissue
(d) Epithelial tissue

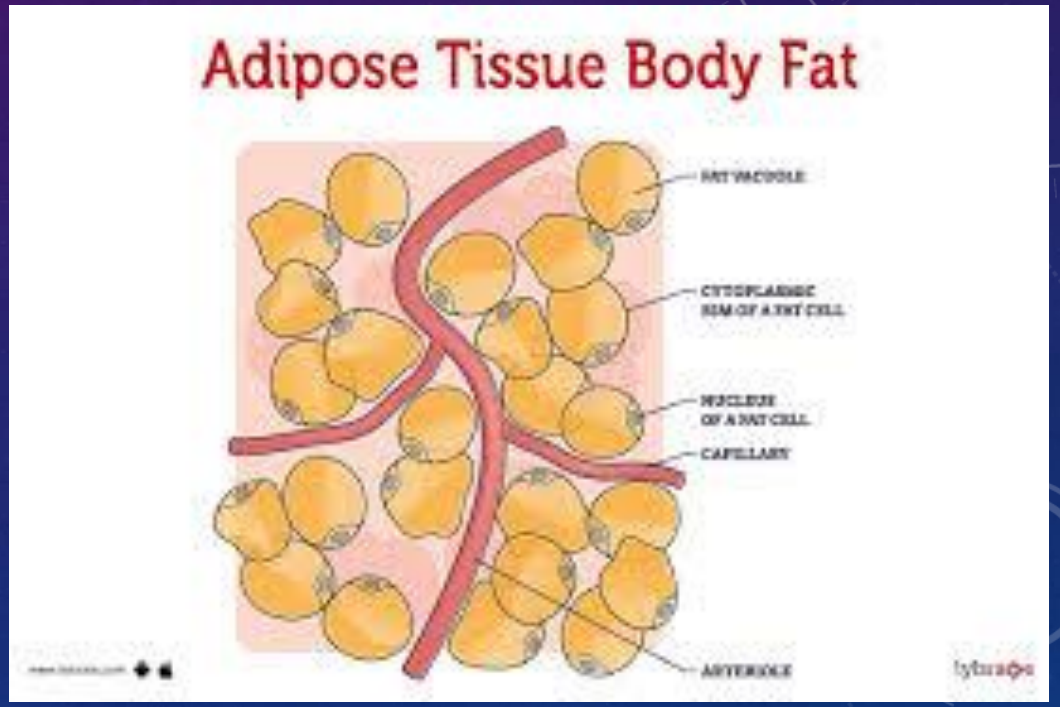
Ans A

(a) Adipose tissue: Correct. Fat in the human body is primarily stored in adipose tissue, which is specialized for fat storage.

(b) Red blood cells: Not correct. Red blood cells are involved in oxygen transport and do not store fat.

(c) Muscle tissue: Not correct. While muscle tissue does store a small amount of fat, the primary storage site for fat is adipose tissue.

(d) Epithelial tissue: Not correct. Epithelial tissue covers body surfaces and organs but does not store fat.



Q. Which one of the following is a feature of Membrane ?

(a) Bilayer of phospholipid molecule in which proteins and cholesterol are embedded
(b) Bilayer of proteins molecule in which lipid and cholesterol are embedded
(c) Bilayer of neutral lipid in which proteins and cholesterol are embedded
(d) Bilayer of neutral lipid lacking cholesterol and proteins

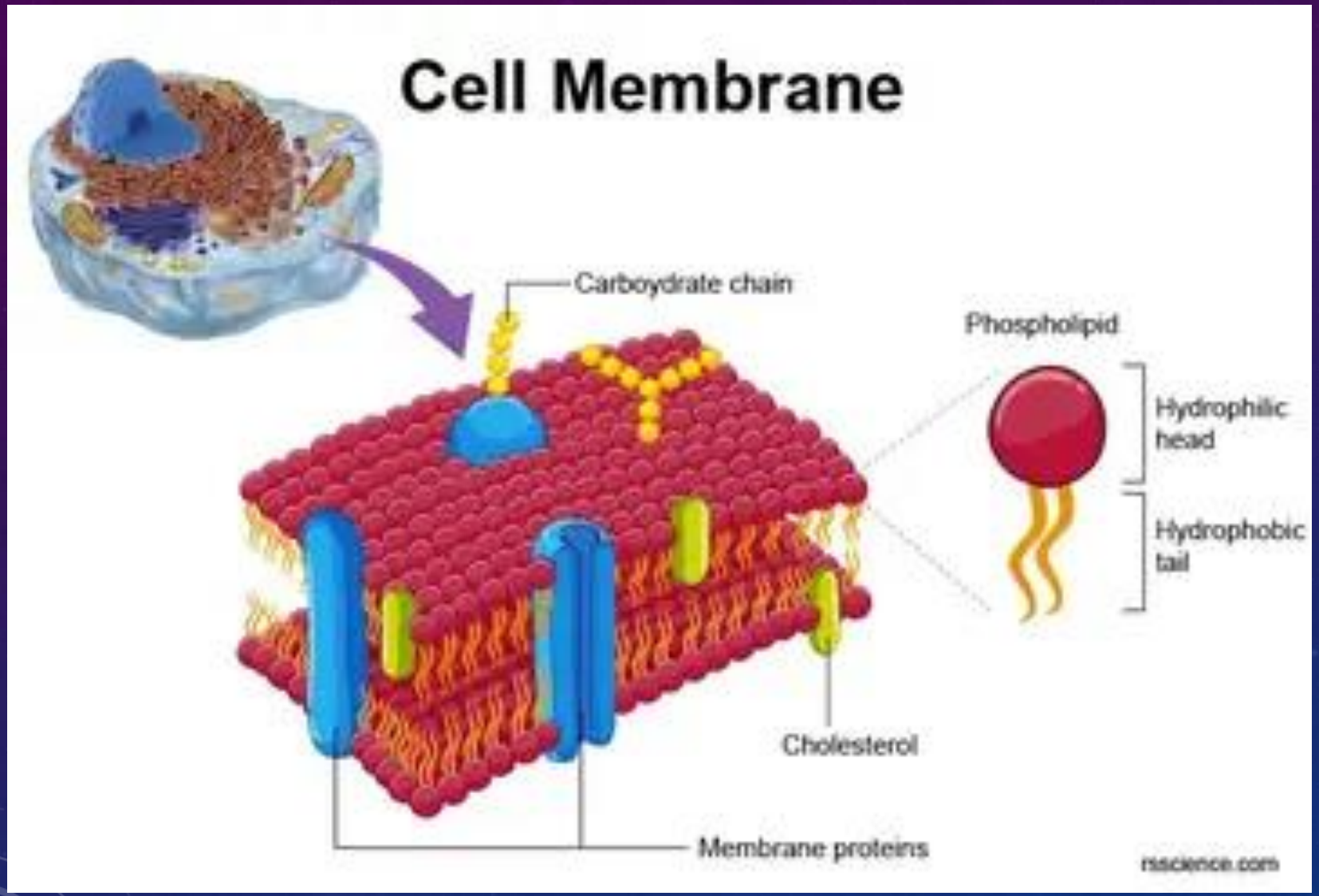
Ans A

(a) Bilayer of phospholipid molecules in which proteins and cholesterol are embedded: Correct. This describes the structure of a typical cell membrane. The membrane consists of a phospholipid bilayer with proteins and cholesterol embedded within it.

(b) Bilayer of protein molecules in which lipid and cholesterol are embedded: Not correct. The cell membrane is primarily composed of a lipid bilayer, not a protein bilayer, with proteins and cholesterol embedded.

(c) Bilayer of neutral lipids in which proteins and cholesterol are embedded: Not correct. The cell membrane is made of a phospholipid bilayer, not just neutral lipids. Proteins and cholesterol are embedded in this phospholipid bilayer.

(d) Bilayer of neutral lipids lacking cholesterol and proteins: Not correct. The cell membrane includes a phospholipid bilayer with embedded cholesterol and proteins.



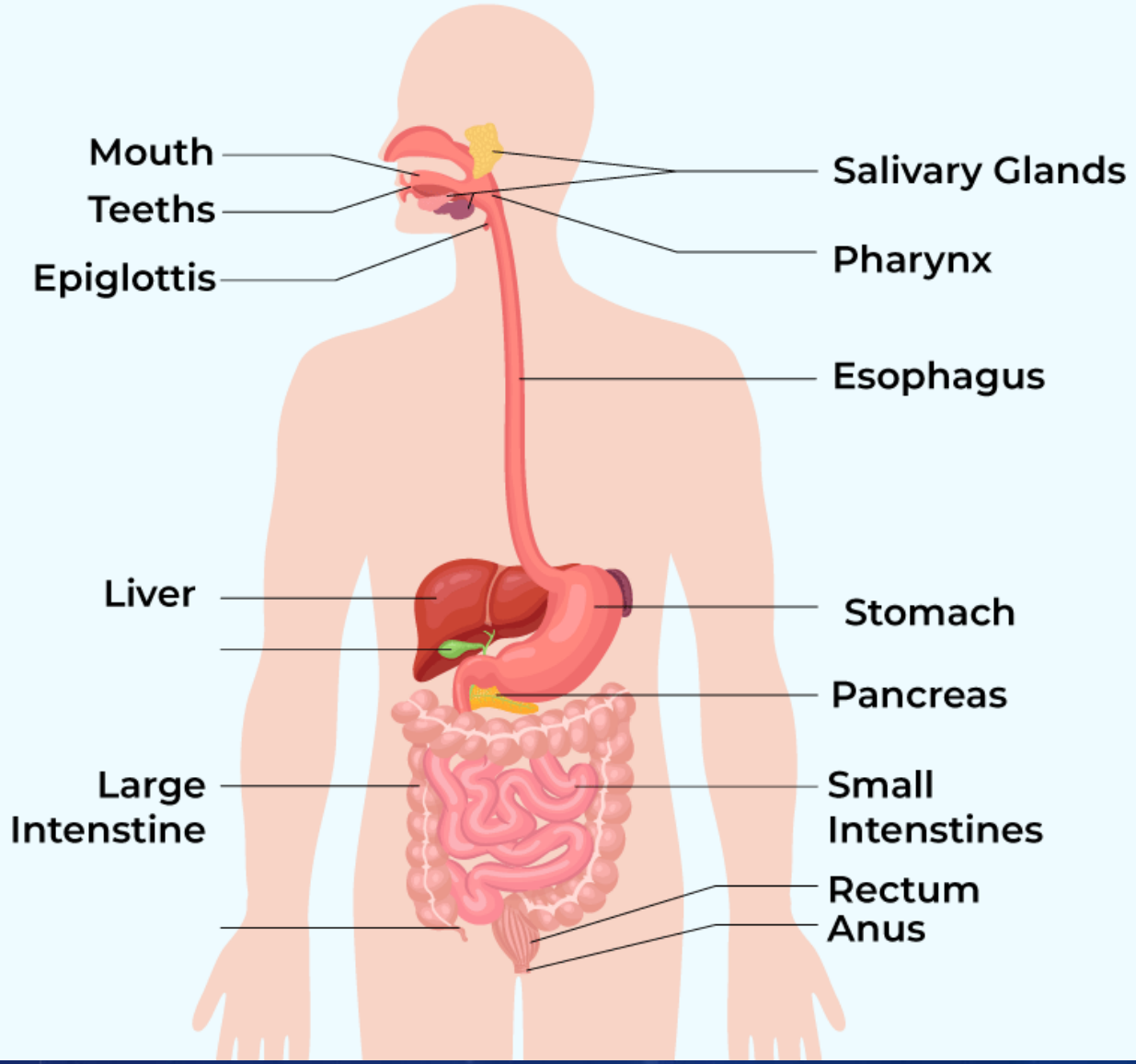
Q. Which one of the following parts of human alimentary canal can be of maximum length?

(a) Stomach
(b) Small intestine
(c) Large intestine
(d) Rectum

Ans B

(a) Stomach: Not correct. The stomach is relatively short compared to the intestines, about 25-30 cm in length.
(b) Small intestine: Correct. The small intestine is the longest part of the alimentary canal, measuring about 6 to 7 meters (20 to 23 feet) in length.
(c) Large intestine: Not correct. The large intestine is shorter than the small intestine, about 1.5 meters (5 feet) in length.
(d) Rectum: Not correct. The rectum is the final segment of the large intestine, about 12-15 cm in length.

Human Digestive System



CDS 2023 (1 and 2) PYQs Biology

TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. A sprinter feels cramps and pain in the thigh muscles after a run. This is due to accumulation of

(a) lactic acid
(b) CO_2
(c) pyruvic acid
(d) ethanol

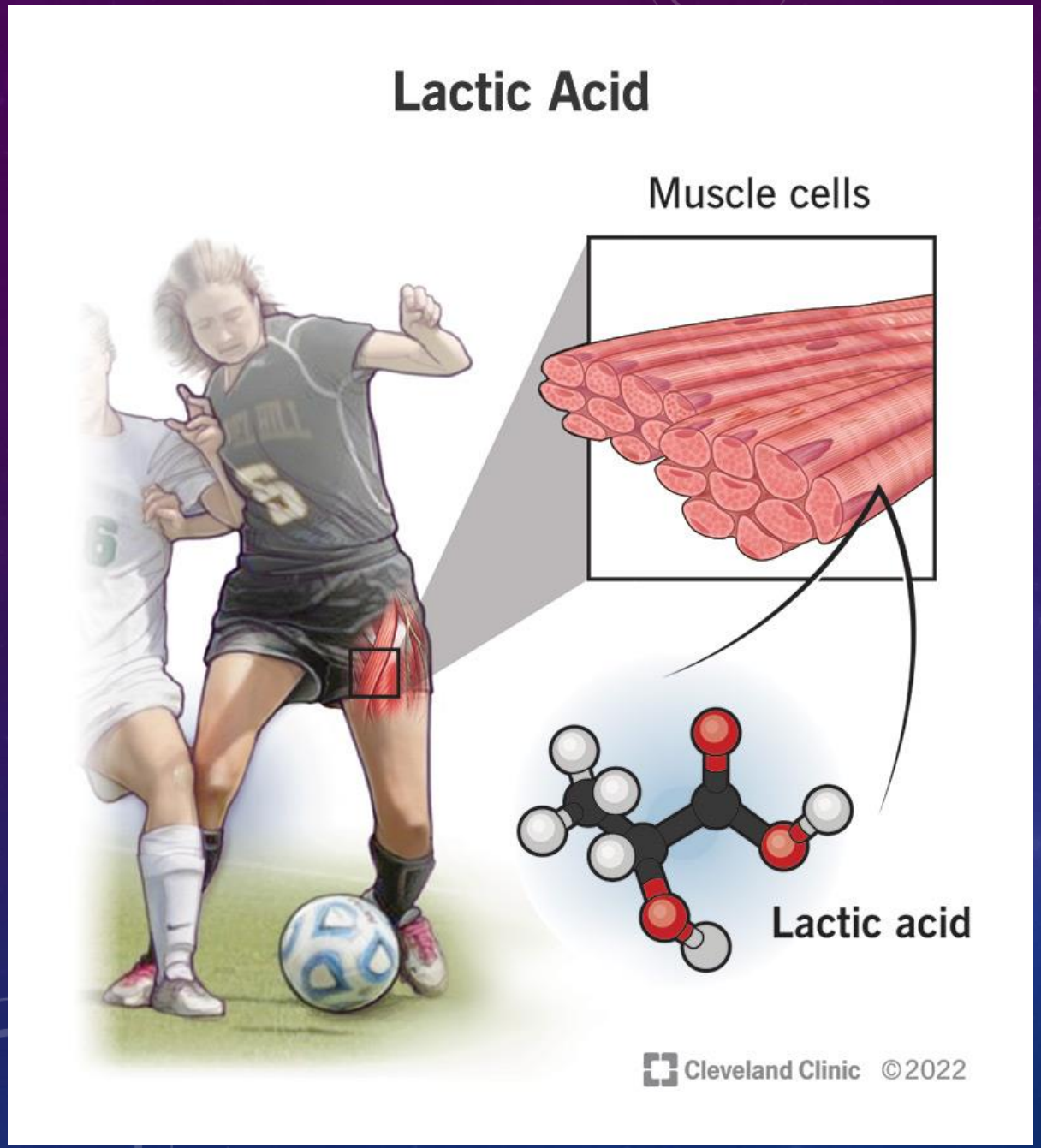
Answer :- (A)

Lactic Acid: During intense exercise, your muscles use energy faster than your body can supply oxygen. This causes the production of lactic acid, which can accumulate and lead to muscle cramps and soreness.

CO2 (Carbon Dioxide): CO2 is produced during exercise but is generally not responsible for muscle cramps. It's mainly exhaled through the lungs.

Pyruvic Acid: Pyruvic acid is a precursor to lactic acid, but it doesn't accumulate in muscles like lactic acid does.

Ethanol: Ethanol is not produced in significant amounts in the body during exercise and is unrelated to muscle cramps.



Q. A leaf was plucked from a plant on a sunny day and kept for 2 minutes in boiling water. It was subsequently immersed in boiling alcohol and treated with iodine solution. What will be the final colour of the leaf after the test?

(a) Colourless
(b) Green
(c) Blue
(d) White

Answer :- (C)

Boiling Water: This step kills the leaf and breaks down the cell membranes, making it easier for the dye to penetrate the cells.

Boiling Alcohol: This step removes chlorophyll, the green pigment in the leaf, so that the iodine can more easily stain other components.

Iodine Solution: Iodine stains starch blue or blue-black.

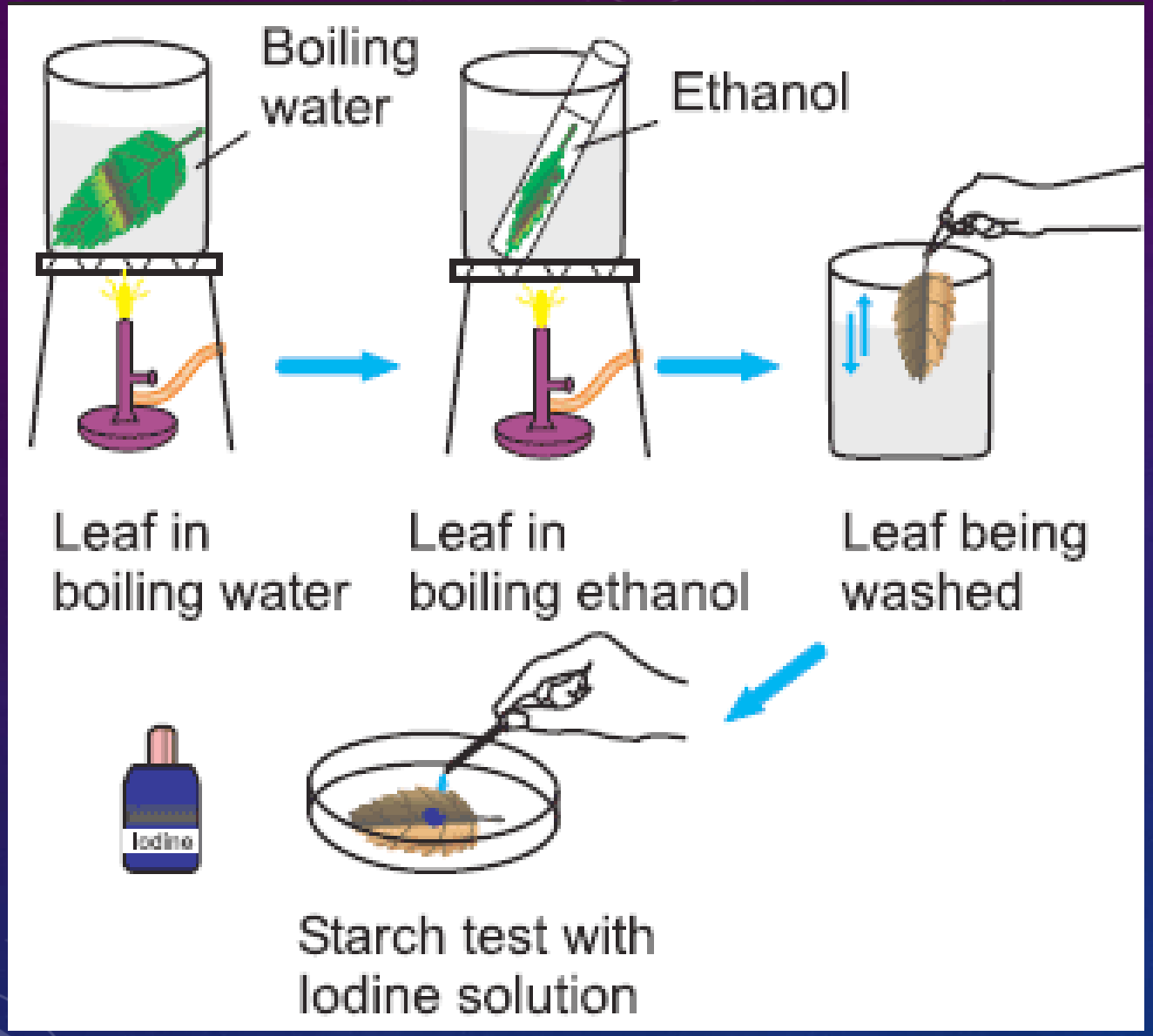
If starch is present, it will turn blue or blue-black. Options Explained:

(a) **Colourless**: This would indicate that no starch is present or the iodine did not properly stain the leaf. Given the procedure, this is unlikely if starch is present.

(b) **Green**: Chlorophyll would be present, but since it was removed in the alcohol step, this color is not expected.

(c) **Blue**: This indicates that the leaf contains starch, which the iodine solution stains blue. This is the expected outcome if starch is present.

(d) **White**: This suggests no starch or an unsuccessful staining process, which is less likely.Final Answer: (c) Blue



Q. If the red blood cells (RBCs) of human blood are isolated and are diluted in normal saline (an isotonic solution to blood), what will happen to the RBCs?

(a) The RBCs will swell
(b) The RBCs will swell and burst
(c) The RBCs will shrink
(d) No change in the diameters of the RBCs

Answer :- (D)

Isotonic Solution: Normal saline is an isotonic solution, meaning its solute concentration is the same as that inside the RBCs. Therefore, there is no net movement of water into or out of the cells.

Options Explained:

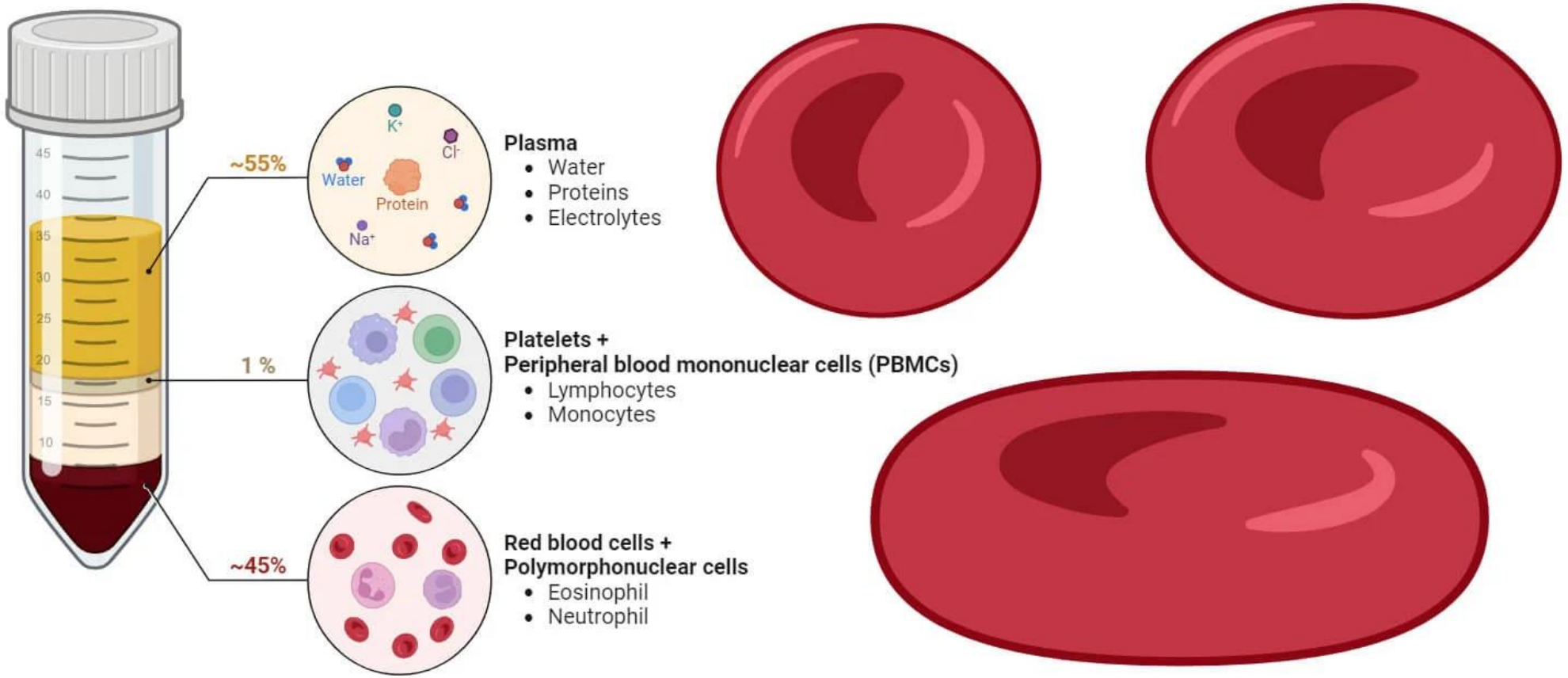
(a) **The RBCs will swell**: This would occur if the solution were hypotonic (lower solute concentration outside the cells), causing water to move into the cells.

(b) **The RBCs will swell and burst**: This happens in a hypotonic solution. However, normal saline is isotonic, so this won't occur.

(c) **The RBCs will shrink**: This would happen in a hypertonic solution (higher solute concentration outside the cells), causing water to leave the cells.

(d) **No change in the diameters of the RBCs**: Since normal saline is isotonic, there will be no net movement of water, so the RBCs will maintain their size.

Red Blood Cells (RBCs)



Plasma
- Water
- Proteins
- Electrolytes

Platelets +
Peripheral blood mononuclear cells (PBMCs)
- Lymphocytes
- Monocytes

Red blood cells +
Polymorphonuclear cells
- Eosinophil
- Neutrophil

Q. Which one of the following statements regarding bile secreted by liver is not correct?

(a) Bile contains enzymes for digestion of lipids.
(b) Bile facilitates emulsification of fats.
(c) Bile neutralizes the acidic pH of the food coming from stomach.
(d) Bile makes the pH of the food alkaline and facilitates action of pancreatic enzymes.

Answer :- (A)

(a) **Bile contains enzymes for digestion of lipids**: This is incorrect. Bile does not contain digestive enzymes. Instead, bile helps in digestion by emulsifying fats, which aids enzymes like lipase in breaking down lipids.

(b) **Bile facilitates emulsification of fats**: This is correct. Bile contains bile salts that break down large fat droplets into smaller ones, increasing the surface area for enzyme action.

(c) **Bile neutralizes the acidic pH of the food coming from the stomach**: This is correct. Bile contains bicarbonate, which neutralizes the acidity of chyme (partially digested food) from the stomach.

(d) **Bile makes the pH of the food alkaline and facilitates action of pancreatic enzymes**: This is correct. By neutralizing stomach acid, bile creates an alkaline environment, which is optimal for pancreatic enzymes to work.

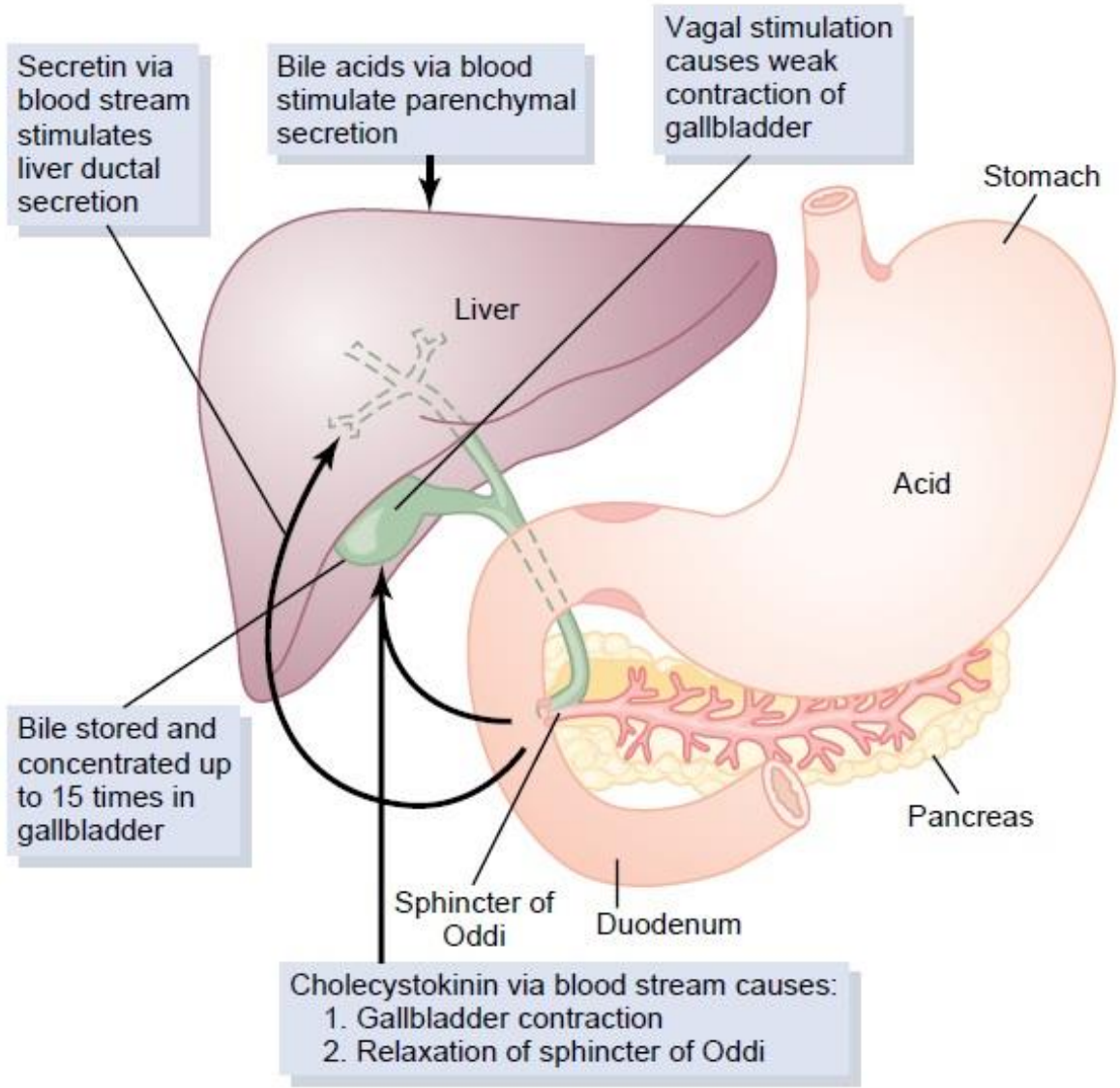


Figure 64–11

Liver secretion and gallbladder emptying.

Q. The blood pressure of a normal human being is found to be 120/80 mmHg. These ‘numbers’ represent the blood pressure at

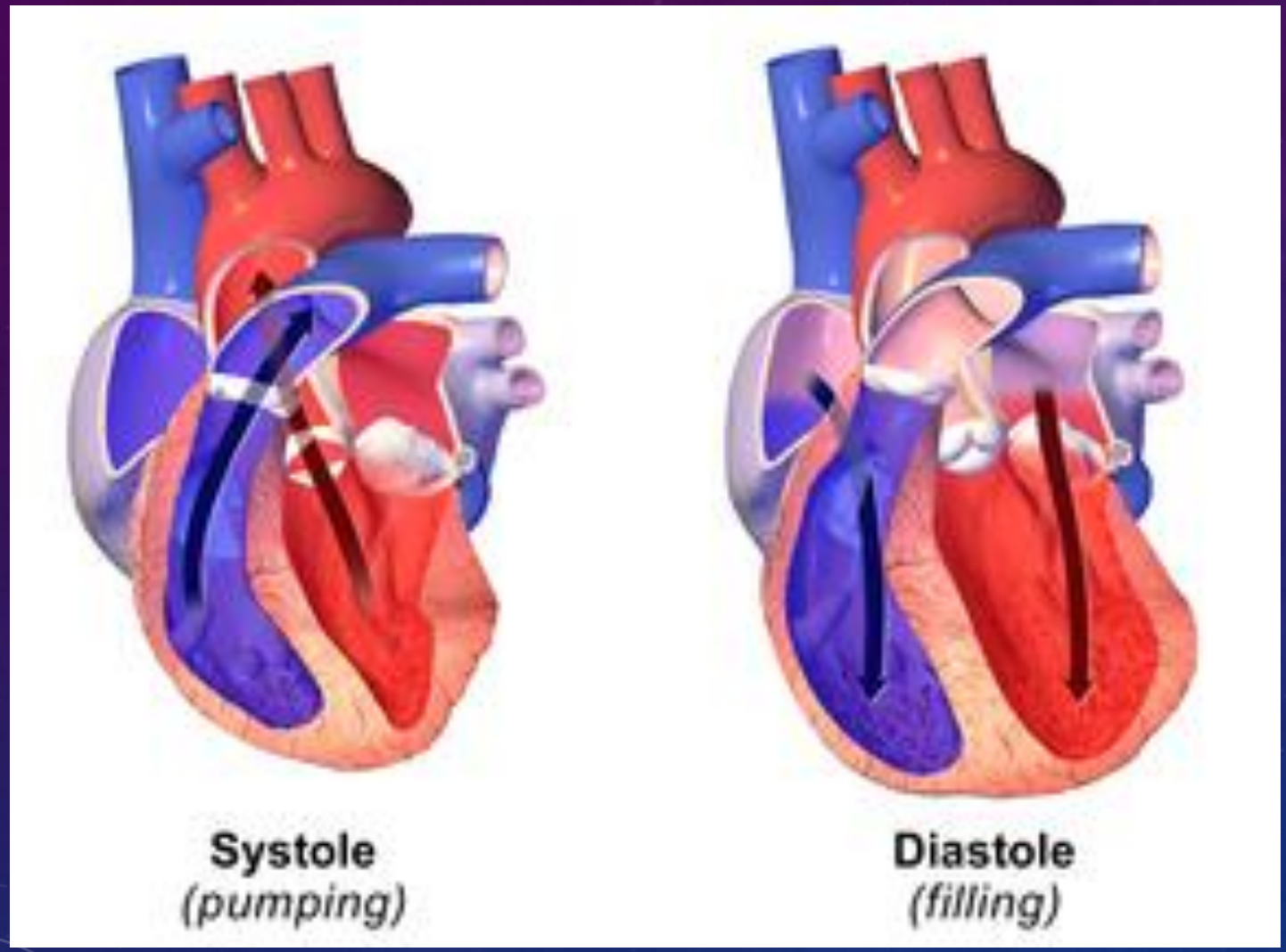
(a) ventricular contraction and ventricular relaxation, respectively
(b) ventricular relaxation and ventricular contraction, respectively
(c) auricular contraction and auricular relaxation, respectively
(d) ventricular contraction and auricular contraction, respectively

Answer :- (A)

Systolic Pressure: This is the higher number (120 mmHg) and represents the pressure in the arteries when the heart's ventricles contract and pump blood out.

Diastolic Pressure: This is the lower number (80 mmHg) and represents the pressure in the arteries when the heart's ventricles are relaxed and filling with blood.

a) **Ventricular contraction and ventricular relaxation, respectively**: This is correct. The first number (120 mmHg) is the systolic pressure, measured during ventricular contraction, and the second number (80 mmHg) is the diastolic pressure, measured during ventricular relaxation.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Reflex arcs are evolved in animals for quick and efficient responses. Which one of the following sequences correctly represents a reflex arc?

(a) Receptor—Sensory neuron—Relay neuron in spinal cord—Brain—Motor neuron—Effector
(b) Receptor—Sensory neuron—Brain —Relay neuron in spinal cord —Motor neuron—Effector
(c) Receptor—Motor neuron—Relay neuron in spinal cord—Sensory neuron—Effector
(d) Receptor—Motor neuron—Brain —Sensory neuron—Effector

Answer :- (A)

A reflex arc is a neural pathway that mediates a reflex action. It is a quick, automatic response to a stimulus that doesn't require conscious thought. Here's a simple breakdown of how a reflex arc works:

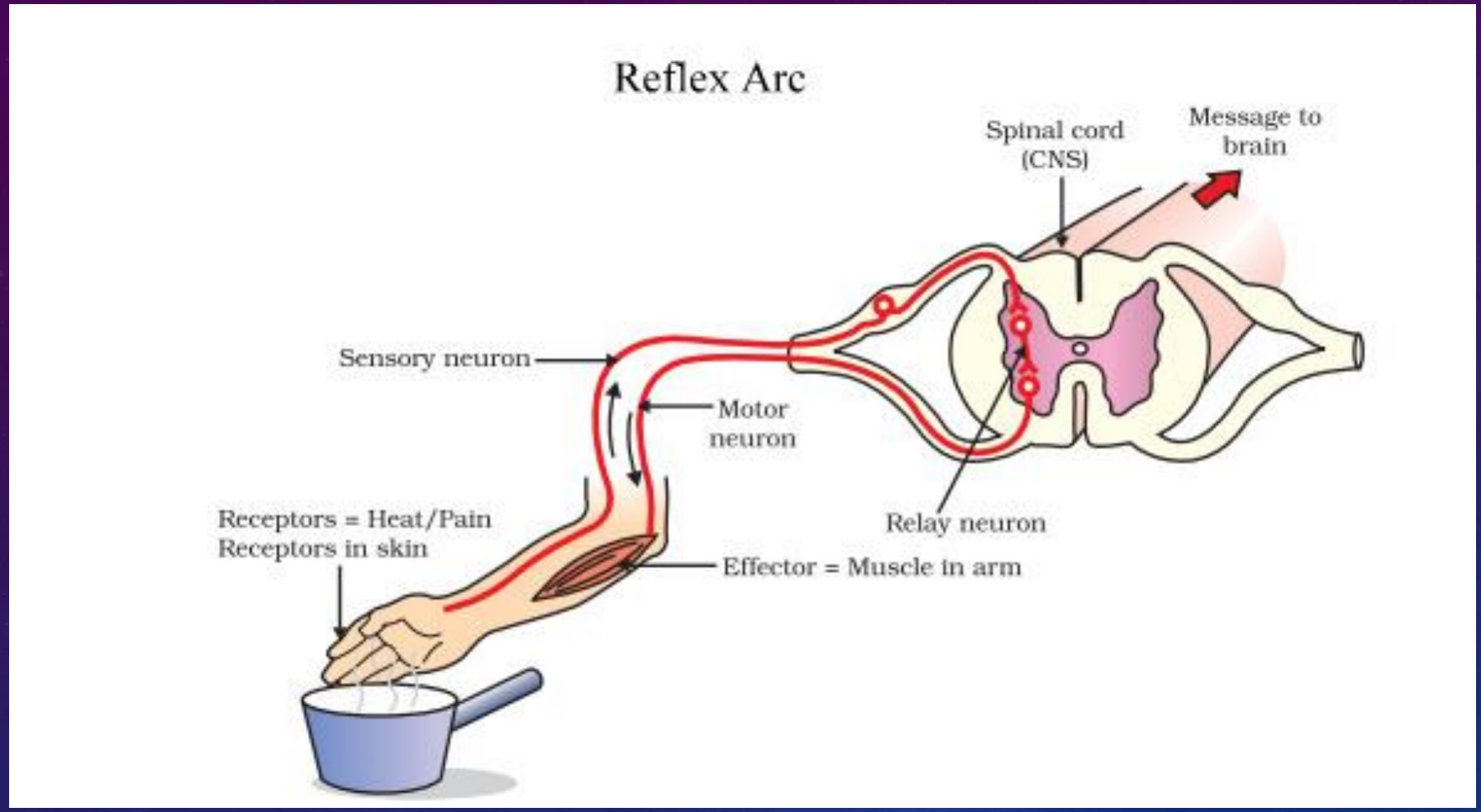
Receptor: Detects a stimulus (e.g., heat, pressure).

Sensory Neuron: Transmits the sensory information from the receptor to the central nervous system (CNS).

Relay Neuron (Interneuron): Located in the spinal cord, it processes the information and relays it to the motor neuron. In simple reflexes, this step can be bypassed, and the sensory neuron directly communicates with the motor neuron.

Motor Neuron: Carries the command from the CNS to the effector.

Effector: The muscle or gland that responds to the motor neuron's command (e.g., pulling your hand away from a hot surface).



Q. Which one of the following is essential for thyroid gland to make thyroxin?

(a) NaC1
(b) KCl
(c) Cholesterol
(d) Iodine

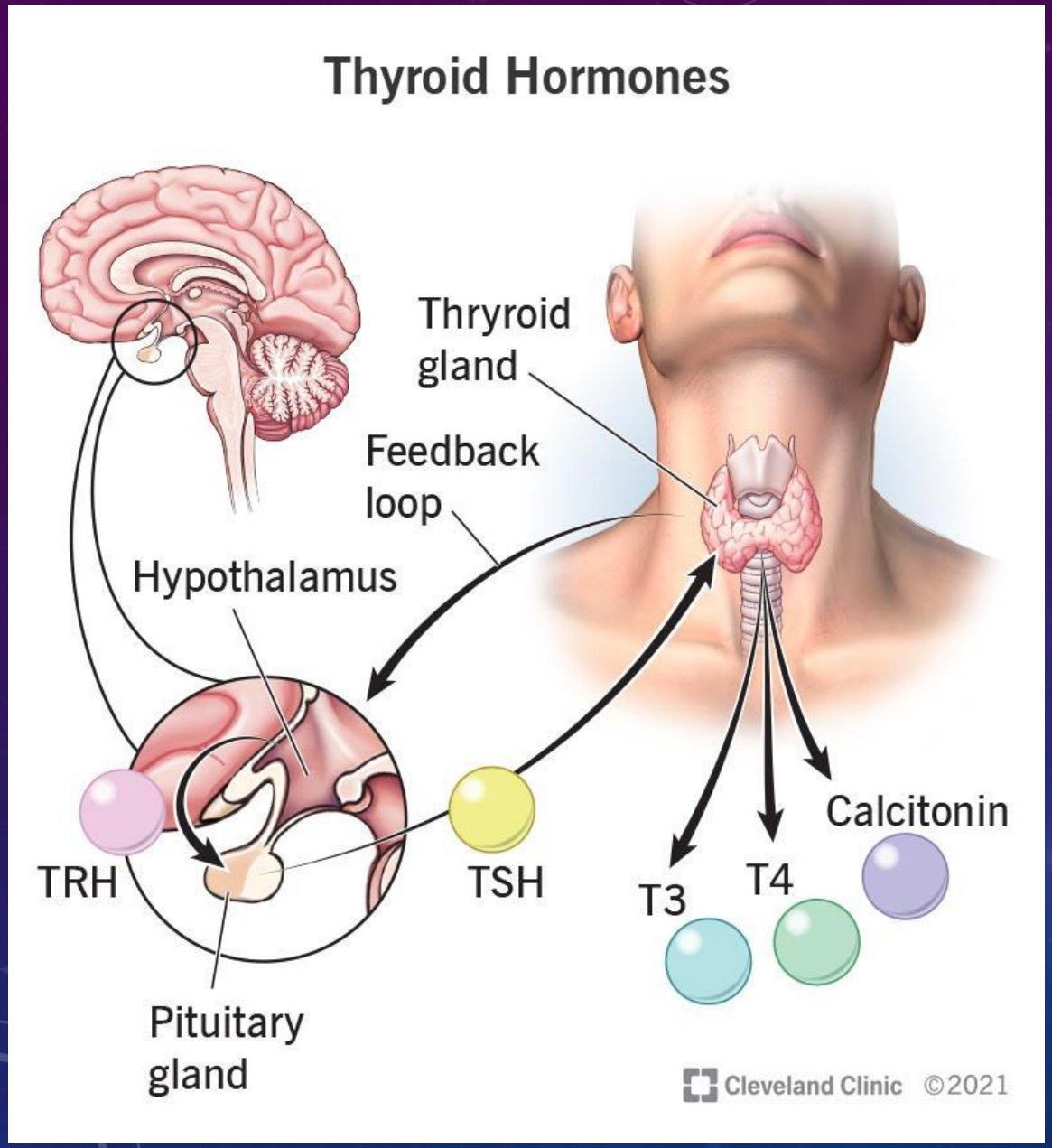
Answer :- (D)

(a) **NaCl (Sodium Chloride)**: While sodium chloride is important for overall body function and electrolyte balance, it is not specifically required for the synthesis of thyroxine.

(b) **KCl (Potassium Chloride)**: Potassium is essential for various cellular functions, but it is not directly involved in the synthesis of thyroxine.

(c) **Cholesterol**: Cholesterol is a precursor for the synthesis of steroid hormones, but it is not involved in the production of thyroxine. Thyroxine is not a steroid hormone.

(d) **Iodine**: Iodine is crucial for the synthesis of thyroid hormones, including thyroxine (T4) and triiodothyronine (T3). Iodine is incorporated into the thyroid hormones during their production in the thyroid gland.



Q. In plant cells, RNA is present in

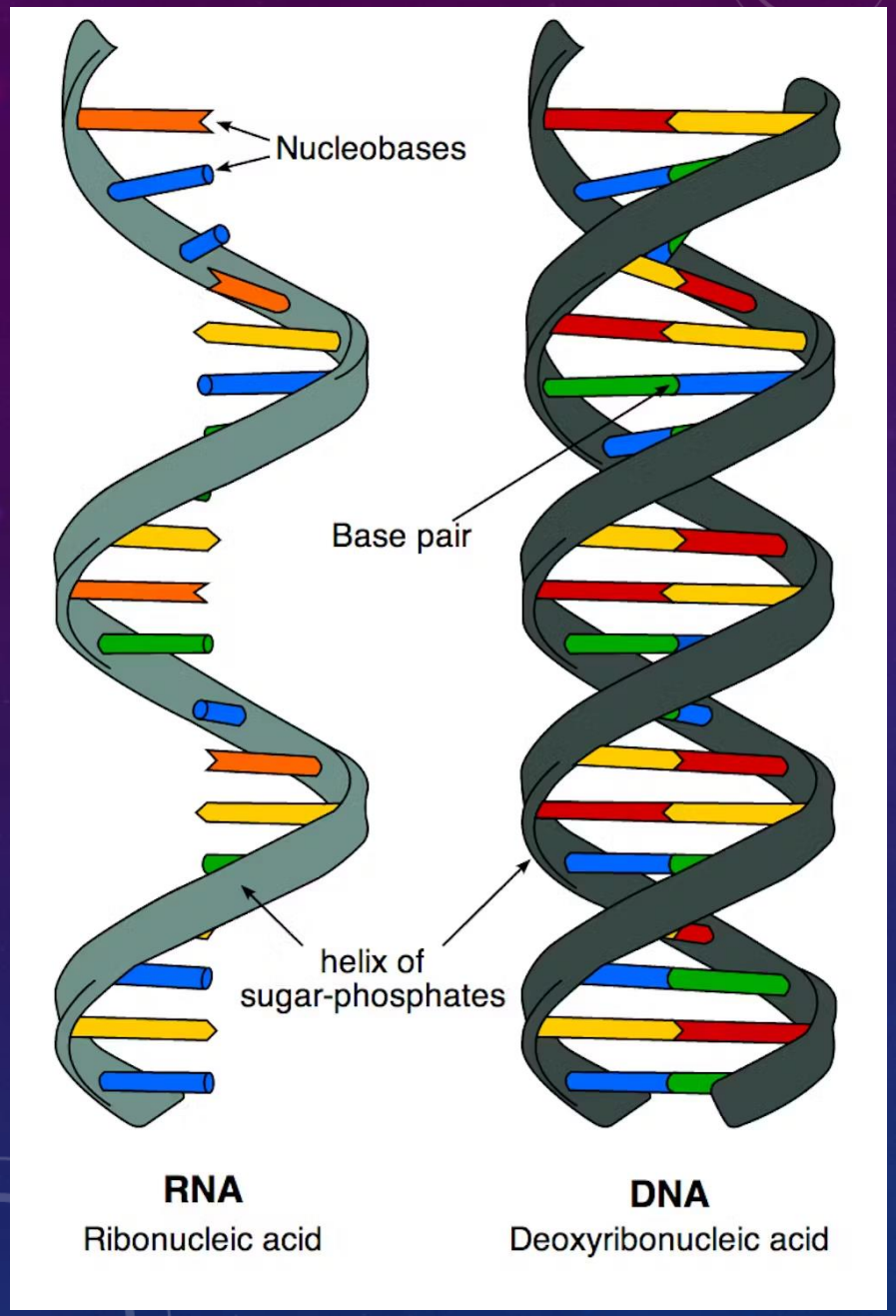
(a) cytoplasm only
(b) nuclei and cytoplasm only
(c) nuclei, cytoplasm, mitochondria, chloroplast and endoplasmic reticulum
(d) nuclei, cytoplasm, mitochondria, chloroplast and ribosomes

Answer :- (D)

RNA is a single-stranded nucleic acid composed of nucleotides. Each nucleotide includes a ribose sugar, a phosphate group, and one of four nitrogenous bases:

adenine (A),
uracil (U),
cytosine (C), and
guanine (G).

Unlike DNA, which uses thymine (T), RNA uses uracil.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. In grasses, intercalary meristem is usually located at

(a) root tip
(b) lateral sides of stem
(c) base of leaves
(d) shoot tip

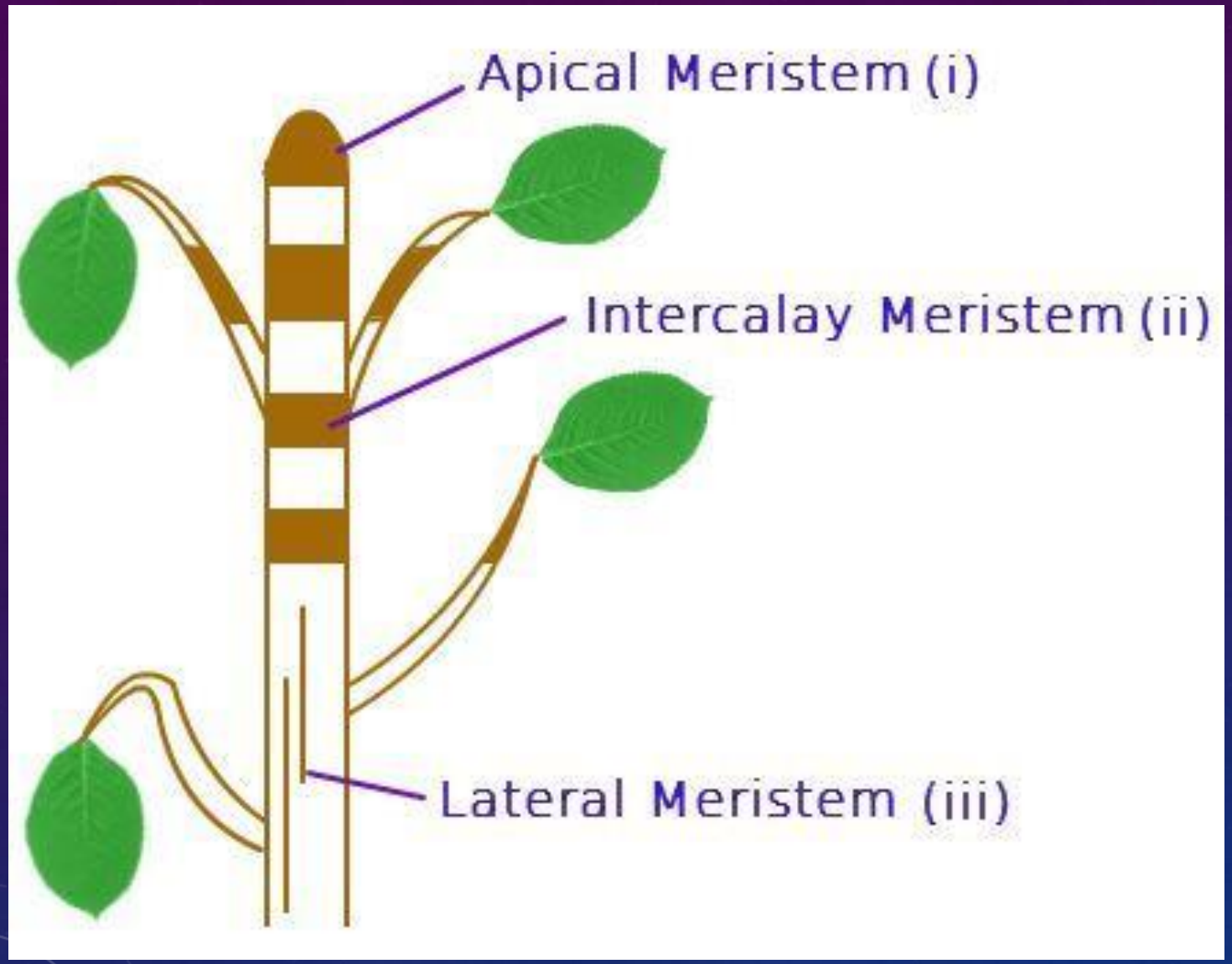
Answer :- (C)

(a) Root Tip: The root tip contains the apical meristem, which is responsible for root growth, not intercalary meristem.

(b) Lateral Sides of Stem: This is not the typical location for intercalary meristem. Lateral meristems, like the vascular cambium and cork cambium, are found in this area, but not intercalary meristem.

(c) Base of Leaves: This is correct. In grasses, the intercalary meristem is located at the base of the leaves and internodes. This location allows for rapid growth and regrowth of leaves, particularly after grazing or cutting.

(d) Shoot Tip: The shoot tip contains the apical meristem, which is responsible for elongation of the stem and formation of new leaves, but not the intercalary meristem.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Xylem is a type of complex tissue in plants for upward conduction of water.
Which one of the following xylem tissues consists of living cells?

(a) Tracheid
(b) Vessel
(c) Xylem parenchyma
(d Xylem fibre

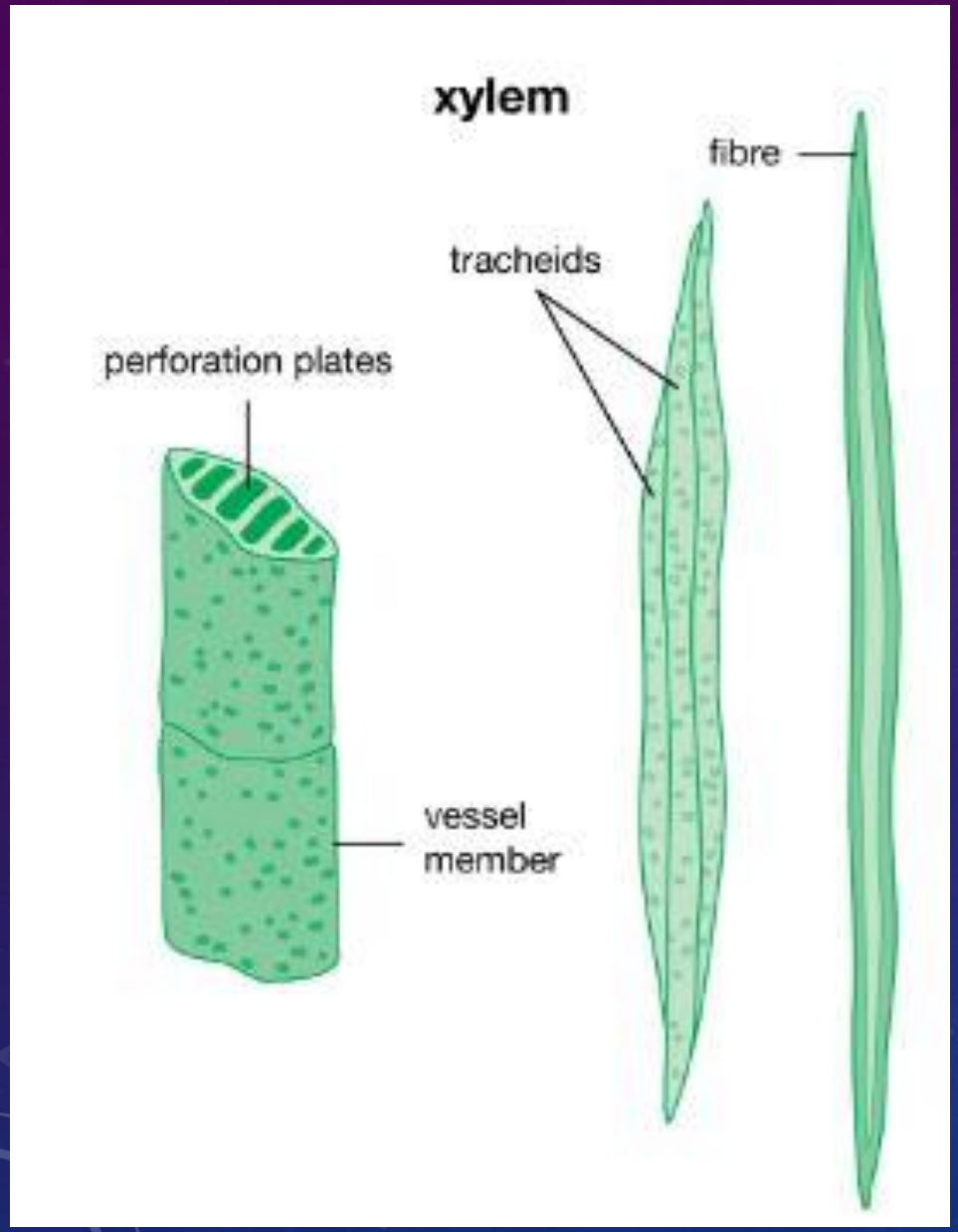
Answer :- (C)

(a) **Tracheid**: Tracheids are xylem cells that conduct water but are dead at maturity. They have thick lignified walls and function primarily in water transport and support.

(b) **Vessel**: Vessel elements are another type of xylem cell that conducts water. They are also dead at maturity and have thick lignified walls. They form long tubes for efficient water transport.

(c) **Xylem Parenchyma**: This type of xylem tissue consists of living cells. Xylem parenchyma cells are involved in storage and lateral transport of nutrients and water. They also contribute to the repair and maintenance of xylem tissue.

(d) **Xylem Fibre**: Xylem fibers are supportive tissues with thick lignified walls and are dead at maturity. They provide structural support to the plant.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

CDS -2 2023

TEAM NISHTHA

SHAPING CAREERS WITH DEVOTION

Q. The term, Phyllotaxy refers to the pattern of:

(a) arrangement of leaves.
(b) branching in stem.
(c) flower formation on branch.
(d) arrangement of flowers.

Answer :- (A)

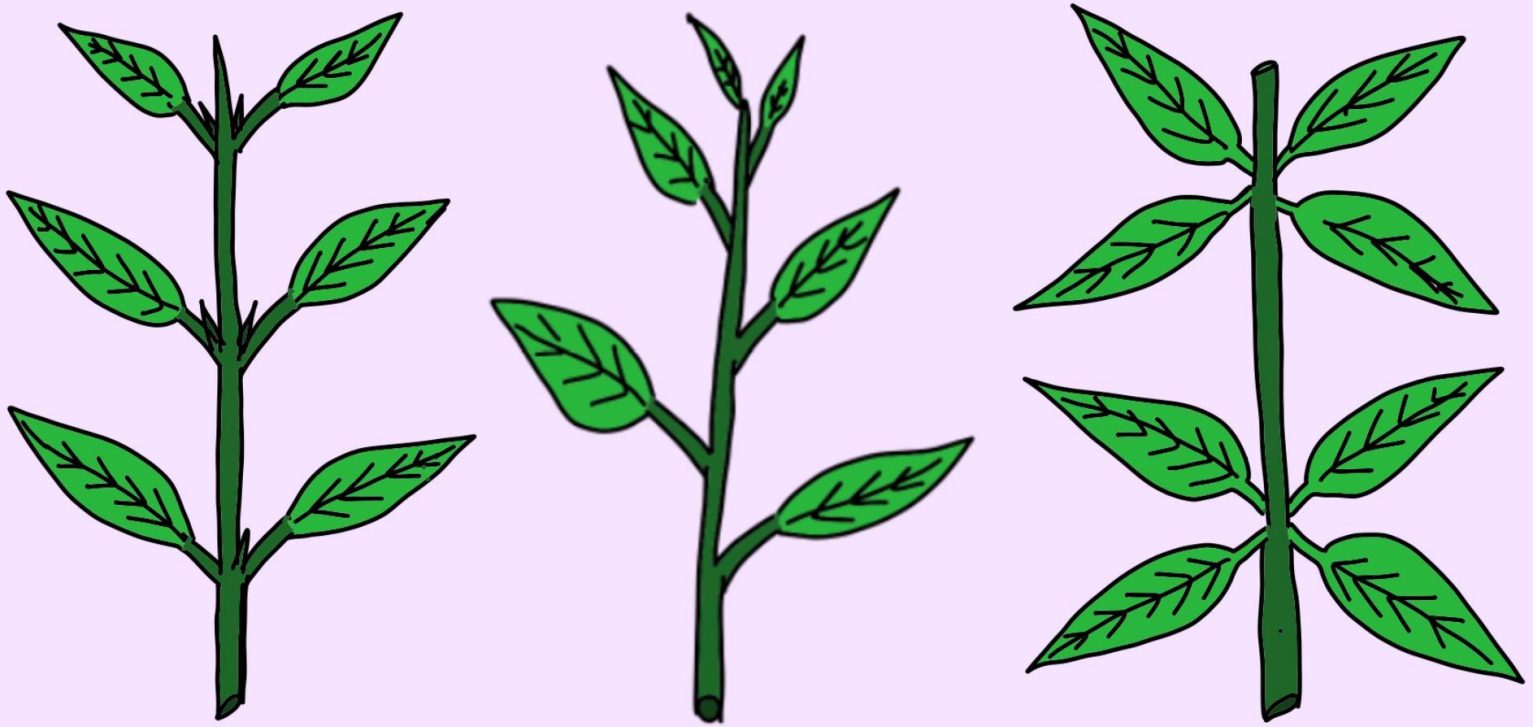
(a) **Arrangement of leaves**: This is correct. Phyllotaxy deals with how leaves are spaced and arranged around the stem or branch, which can affect light capture and plant structure.

(b) **Branching in stem**: This refers to how branches emerge from the stem, not the arrangement of leaves.

(c) **Flower formation on branch**: This pertains to the arrangement of flowers, which is not described by phyllotaxy.

(d) **Arrangement of flowers**: This is related to floral arrangement, which is different from leaf arrangement and is not covered by the term phyllotaxy.

Types of Phyllotaxy



Opposite Alternate Whorled

Q. Chromosomes are composed of DNA and:

(a) lipids
(b) vitamins
(c) proteins
(d) carbohydrates

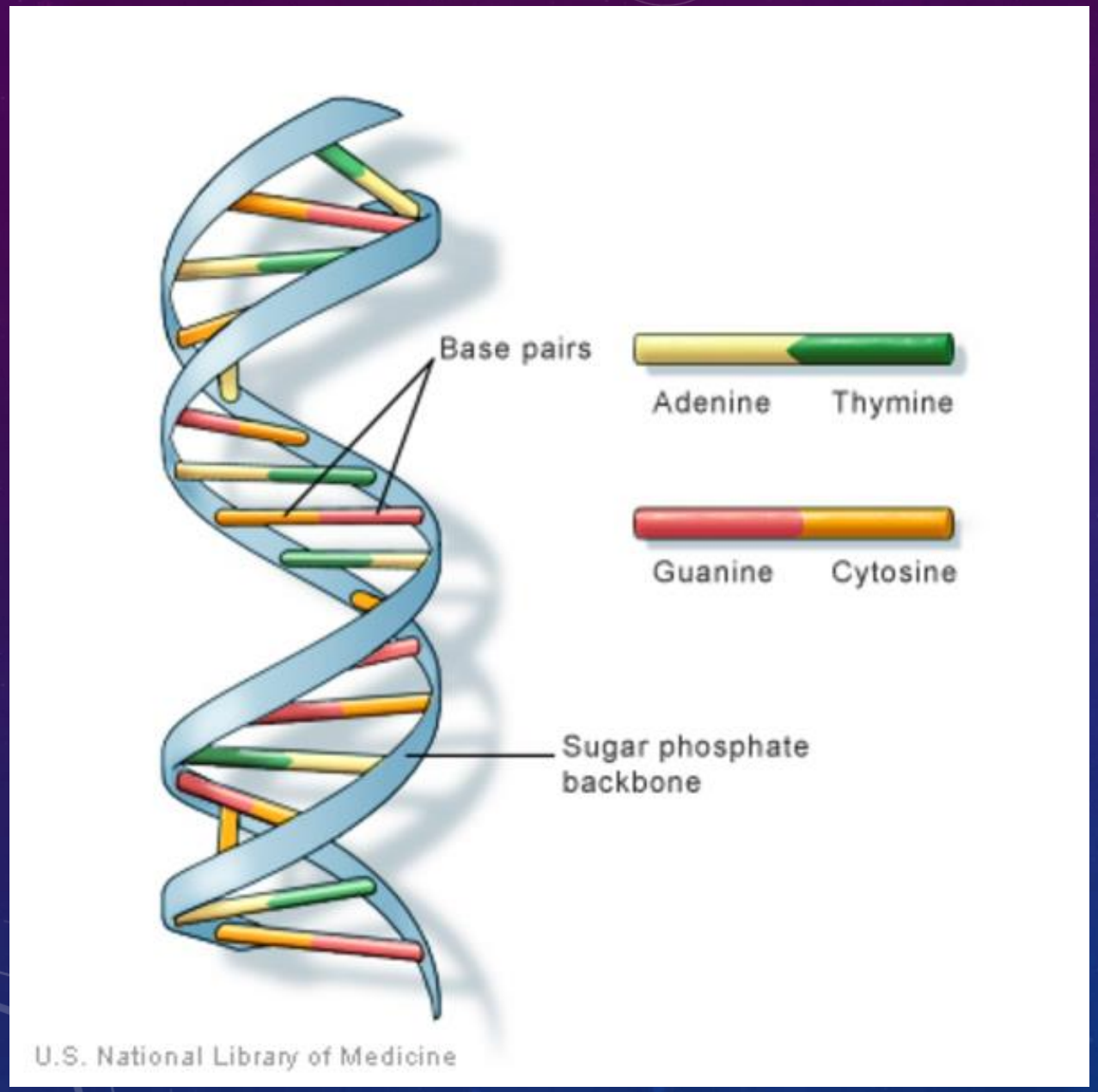
Answer :- (C)

(a) **Lipids**: Not a primary component of chromosomes. Lipids are more related to cell membranes.

(b) **Vitamins**: Not involved in the composition of chromosomes. Vitamins are essential nutrients but not structural components of chromosomes.

(c) **Proteins**: Correct. Chromosomes are composed of DNA and proteins. The proteins in chromosomes are primarily histones, which help package and organize DNA into a compact, structured form.

(d) **Carbohydrates**: Not a primary component of chromosomes. Carbohydrates are involved in various cellular functions but not in the structural composition of chromosomes.



Q. Bacteria have an undefined nuclear region which lacks a nuclear membrane and contains only DNA without proteins. Such a region is called:

(a) Nucleosome
(b) Nucleus
(c) Nucleoprotein
(d) Nucleoid

Answer :- (D)

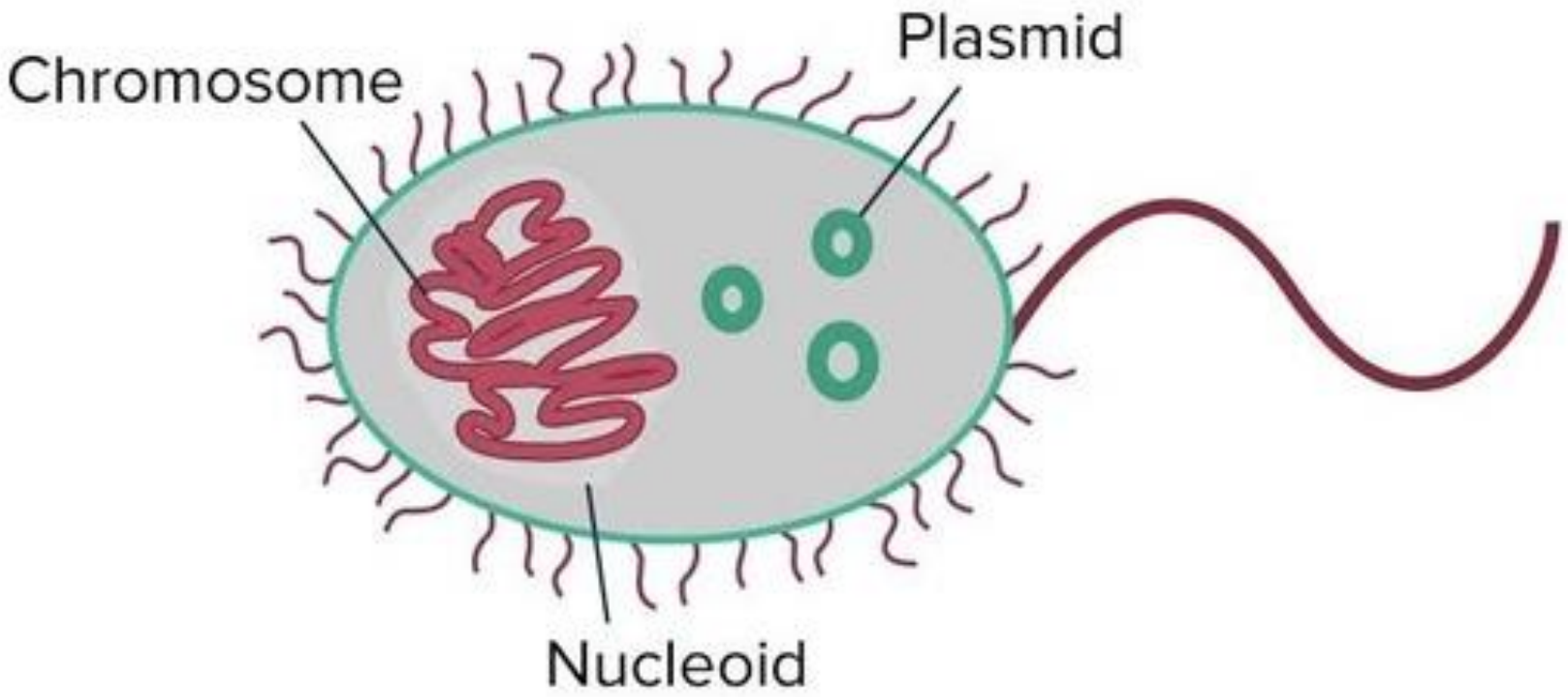
(a) **Nucleosome**: This is a structural unit of DNA packaging in eukaryotic cells, consisting of DNA wrapped around histone proteins. It is not found in bacteria.

(b) **Nucleus**: This is a membrane-bound organelle in eukaryotic cells that contains the cell's genetic material. Bacteria do not have a nucleus.

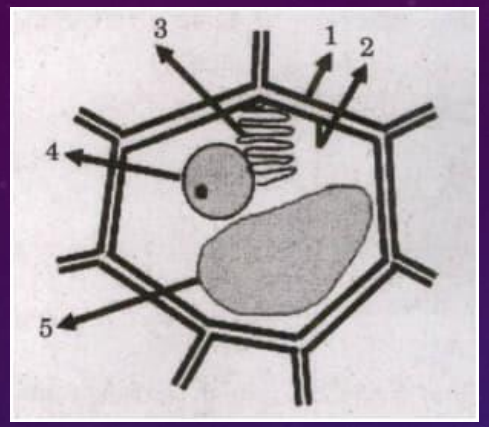
(c) **Nucleoprotein**: This refers to a complex of nucleic acids and proteins. It is not a specific structure but rather a general term for such complexes.

(d) **Nucleoid**: This is the correct term. The nucleoid is the irregularly shaped region in a bacterial cell where the DNA is located. It lacks a membrane and is not enclosed within a defined structure like a nucleus.

Nucleoid



Q. In the following simplified diagram of a plant cell, five parts/organelles are marked from 1 to 5:



Which one of the following correctly represents the above parts/organelles?

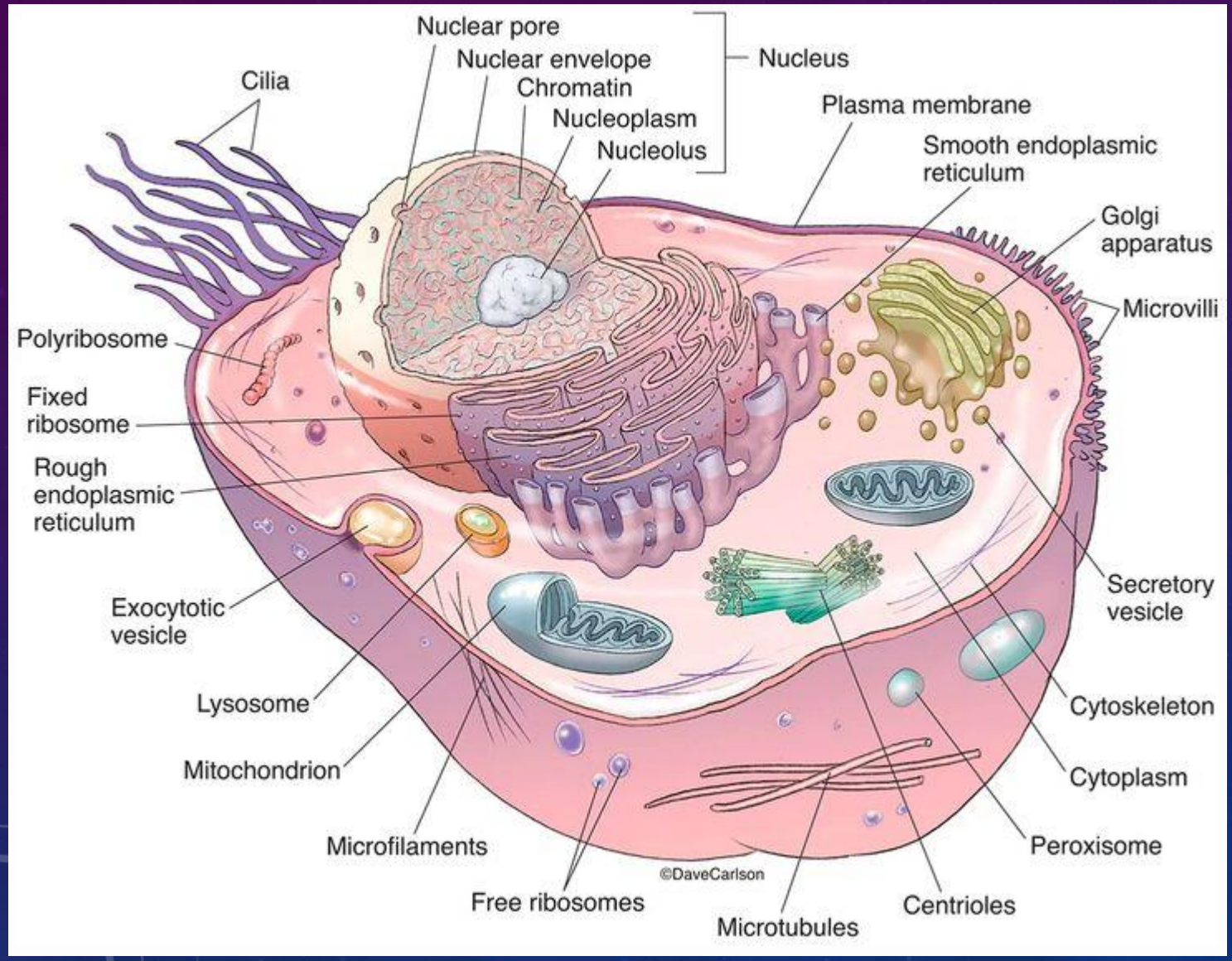
(a) 1-cell membrane; 2- cell wall;
3- vacuole; 4 endoplasmic reticulum;
5-nucleus

(b) 1-cell wall; 2- cell membrane;
3- endoplasmic reticulum; 4 - vacuole;
5- nucleus

(c) 1-cell wall; 2cell membrane;
3 endoplasmic reticulum; 4- nucleus;
5-vacuole

(d) 1-cell wall; 2cell membrane;
3-vacuole; 4 endoplasmic reticulum;
5- nucleus

Answer :- (C)



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Which one of the following is the correct combination of organelles and their functions?

(a) Mitochondria - Respiration; Chloroplast - Photosynthesis; Ribosome - Protein Synthesis; Rough endoplasmic reticulum -Transport of proteins

(b) Mitochondria - Respiration; Chloroplast - Photosynthesis; Ribosome - Transport of proteins; Rough endoplasmic reticulum - Protein synthesis

(c) Mitochondria - Respiration; Chloroplast- Protein synthesis; Ribosome - Photosynthesis; Rough endoplasmic
reticulum - Transport of proteins

(d) Mitochondria - Photosynthesis; Chloroplast - Respiration; Ribosome - Protein synthesis; Rough endoplasmic reticulum-Transport of proteins

Answer :- (A)

(a) **Mitochondria - Respiration; Chloroplast - Photosynthesis; Ribosome - Protein Synthesis; Rough endoplasmic reticulum - Transport of proteins**

Mitochondria: Correctly involved in respiration, where they generate ATP through cellular respiration.

Chloroplast: Correctly involved in photosynthesis, where they convert light energy into chemical energy.

Ribosome: Correctly involved in protein synthesis, where they assemble proteins based on mRNA sequences.

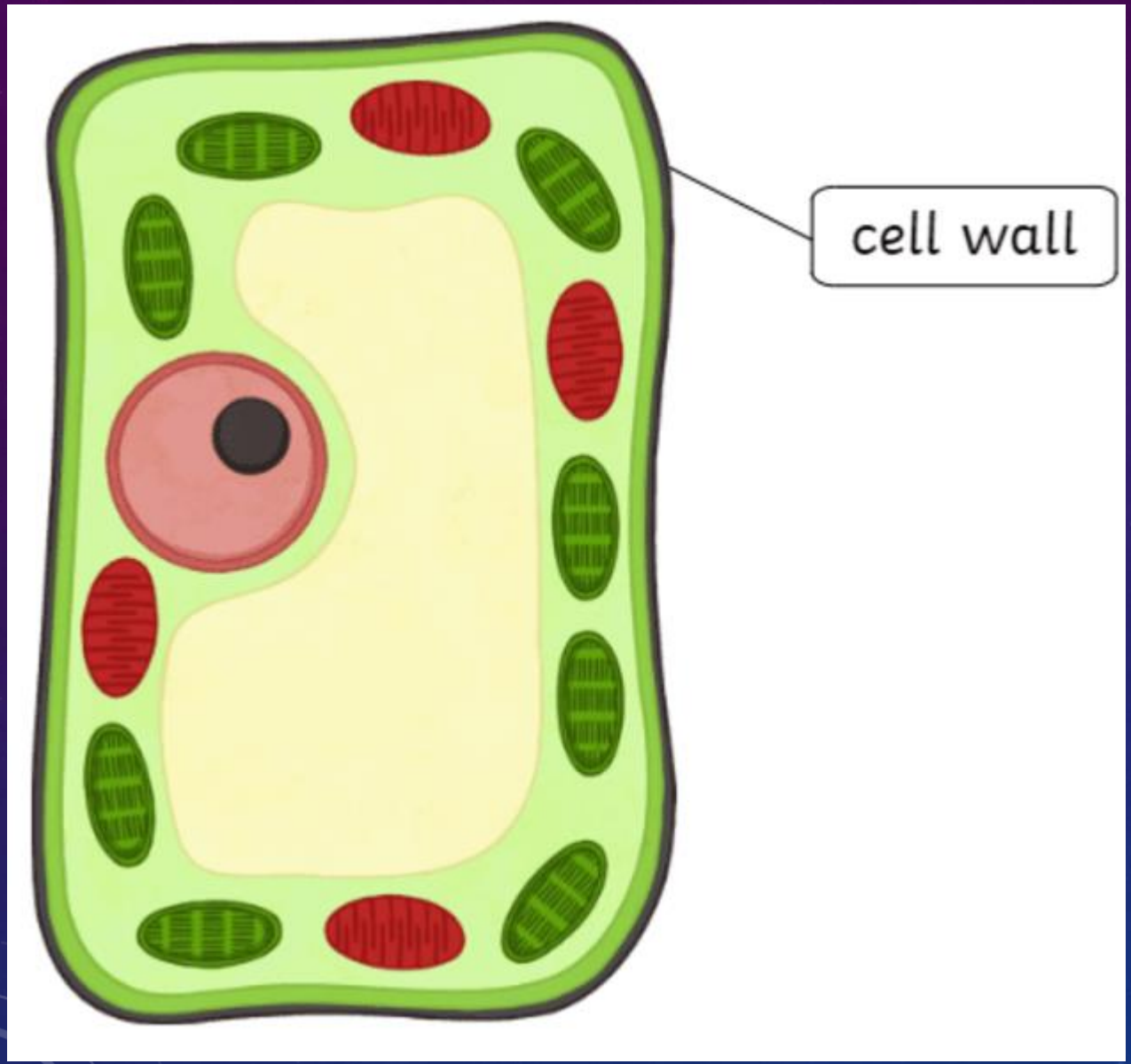
Rough Endoplasmic Reticulum (ER): Correctly involved in the transport of proteins; it has ribosomes attached and is involved in protein synthesis and modification.

Q. Cell wall is absent in which one of the following organisms?

(a) Bacteria
(b) Diatom
(c) Mushroom
(d) Tapeworm

Answer :- (D)

(a) **Bacteria**: Bacteria have a cell wall that varies in composition, typically containing peptidoglycan.
(b) **Diatom**: Diatoms, a type of algae, have a cell wall made of silica, called a frustule.
(c) **Mushroom**: Mushrooms are fungi, and their cell walls are made of chitin.
(d) **Tapeworm**: Tapeworms are animals and do not have a cell wall. Instead, they have a flexible outer layer called the tegument.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Water goes up through xylem vessels in tall trees. The process in plants and properties of water that help in upward movement are:

(a) Respiration and cohesion
(b) Transpiration pull, cohesion and adhesion
(c) Root pressure, cohesion and adhesion
(d) Transpiration and adhesion

Answer :- (B)

(a) **Respiration and cohesion**:

Respiration: Not involved in the upward movement of water in plants. Respiration is a process where cells convert glucose and oxygen into energy.

Cohesion: Correct. Cohesion refers to the attraction between water molecules, which helps in the formation of a continuous water column.

(b) **Transpiration pull, cohesion, and adhesion**:

Transpiration Pull: Correct. Transpiration, the evaporation of water from plant leaves, creates a negative pressure that pulls water up through the xylem vessels.

Cohesion: Correct. Cohesion helps maintain the continuity of the water column within the xylem.

Adhesion: Correct. Adhesion is the attraction between water molecules and the walls of the xylem vessels, which helps water climb up against gravity.

(c) **Root pressure, cohesion, and adhesion**:

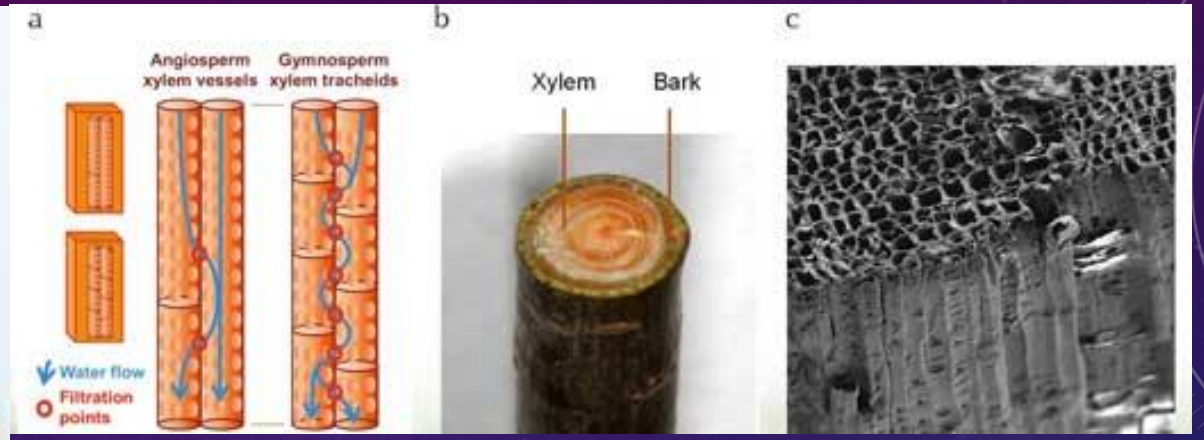
Root Pressure: This is a minor contributor to water movement compared to transpiration, and it is not the primary force in tall trees.

Cohesion and Adhesion: Correct, but the process mentioned is not the primary driver in tall trees.

(d) **Transpiration and adhesion**:

Transpiration: Correct. It is the main driver of water movement in plants.

Adhesion: Correct. It helps in the upward movement of water by sticking to the xylem walls, but cohesion is also crucial.



TEAM NISHTHA
SHAPING CAREERS WITH DEVOTION

Q. Energy and nutrients flow from one trophic level to another in an ecosystem. Which one of the following statements correctly describes the direction of flow of energy and nutrients in an ecosystem?

(a) Energy flow is cyclic and nutrient flow is unidirectional.
(b) Energy flow is unidirectional and nutrient flow is cyclic.
(c) Both energy and nutrient flow are unidirectional.
(d) Both energy and nutrient flow are cyclic

Answer :- (B)

(a) **Energy flow is cyclic and nutrient flow is unidirectional**:
Energy Flow: Energy flow is not cyclic; it is unidirectional, moving from producers to consumers and eventually dissipating as heat.
Nutrient Flow: Nutrients flow in a cyclic manner, being recycled through various biogeochemical cycles (e.g., carbon, nitrogen cycles).
(b) **Energy flow is unidirectional and nutrient flow is cyclic**:
Energy Flow: Correct. Energy flows in a one-way direction through the food chain or web, from producers to various levels of consumers, and eventually to decomposers, where it is lost as heat.
Nutrient Flow: Correct. Nutrients are recycled within the ecosystem, moving through different organisms and environmental reservoirs.

Q. Which one of the following is a saprophyte?

(a) Cuscuta
(b) Rhizopus
(c) Spirogyra
(d) Grass

Answer :- (B)

(a) Cuscuta: Also known as dodder, it is a parasitic plant that derives nutrients from living host plants, not dead organic matter.

(b) Rhizopus: This is a genus of fungi commonly known as bread molds. Rhizopus is a saprophyte because it decomposes dead organic material and obtains nutrients from it.

(c) Spirogyra: This is a genus of filamentous green algae that performs photosynthesis to obtain nutrients. It is not a saprophyte.

(d) Grass: Grass is a primary producer that performs photosynthesis to produce its own food and is not a saprophyte.

Q. In ovules of Angiosperms, which one of the following is not a haploid cell?

(a) Nucellus
(b) Synergid
(c) Egg
(d) Antipodal

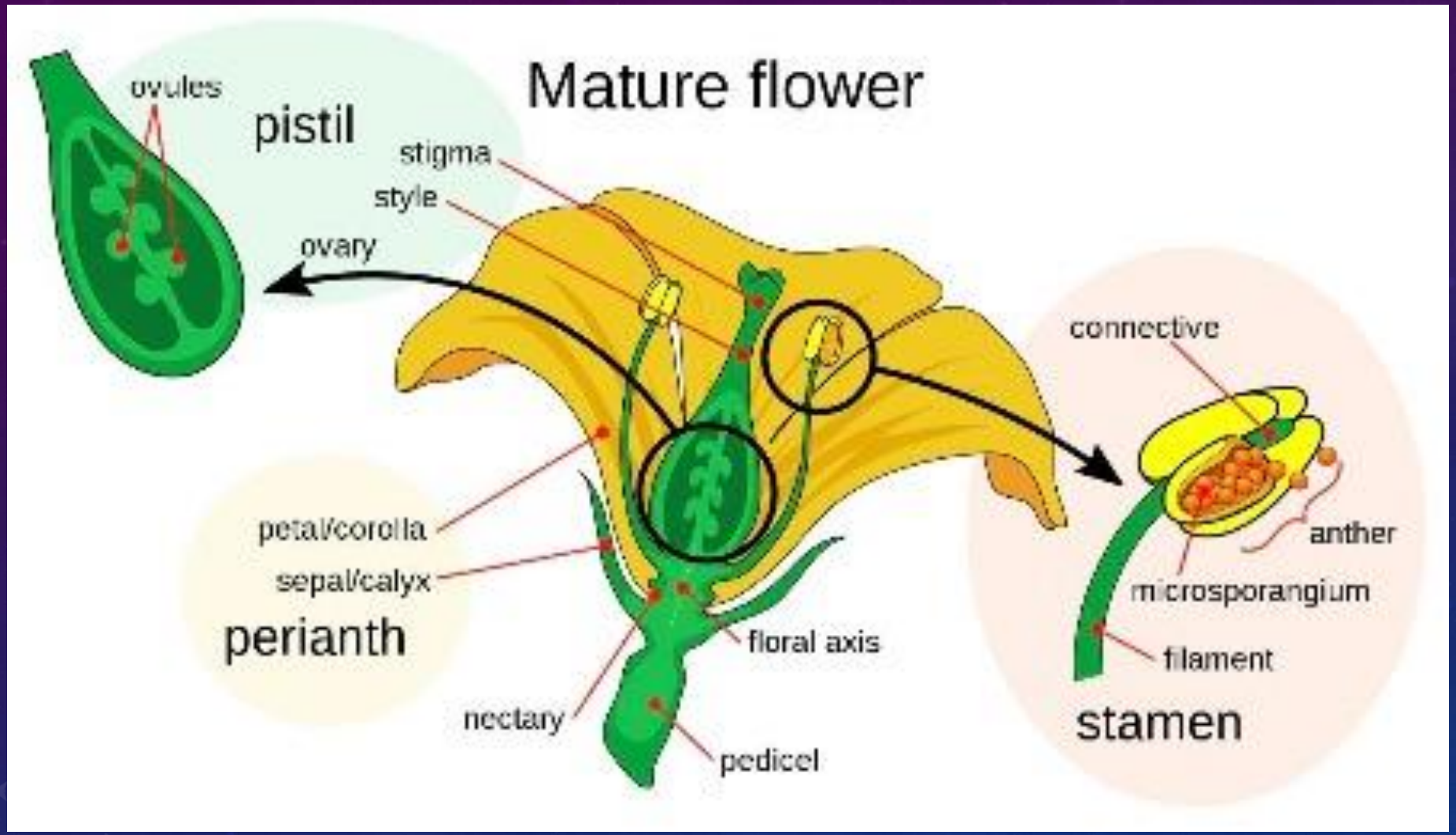
Answer :- (A)

(a) Nucellus: This is a tissue within the ovule that surrounds the embryo sac. It is diploid (2n) because it originates from the maternal sporophyte plant and is not involved in direct reproduction.

(b) Synergid: These are haploid cells located near the egg cell within the embryo sac. They help guide the pollen tube to the egg cell.

(c) Egg: The egg cell in the embryo sac is haploid (n). It combines with the sperm cell to form a diploid zygote.

(d) Antipodal: These cells are located opposite the micropyle of the embryo sac and are haploid (n).



THANK YOU FOR WATCHING

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