

**CBSE**  
**Class XI Biology**  
**Sample Paper – 8 Solution**

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**SECTION A**

1. Urochordates are also called tunicates because the adult body is enclosed within a leathery test or tunic formed of a cellulose-like organic substance termed tunicin.

**OR**

Parapodia are lateral appendages. They help in locomotion.

2. A neem leaf is pinnately compound because its lamina is completely broken up into distinct segments or leaflets which are separately articulated at the base.
3. Insulin
4. It requires a membrane, a proton pump, a proton gradient and the enzyme ATPase.

**OR**

LHC is light harvesting complex. It is present in both photosystem I and photosystem II.

5. Sebaceous glands (wax glands)

**SECTION B**

6. Bryophytes are called amphibians of the plant kingdom because they live in soil but require an external layer of water for their existence so that the male gametes can swim and reach the archegonia.
7.
  - i. In *Amoeba*, the contractile vacuole is involved in excretion and osmoregulation.
  - ii. In protists, food vacuoles contain digestive enzymes which help digest nutrients.
8. When  $p\text{CO}_2$  is high and  $p\text{O}_2$  is low as in the tissue, more binding of carbon dioxide with haemoglobin occurs, whereas when the  $p\text{CO}_2$  is low and  $p\text{O}_2$  is high as in the alveoli, dissociation of  $\text{CO}_2$  from carbaminohaemoglobin takes place.
9. Emphysema is inflation or abnormal distension of the bronchioles or alveolar sacs of the lungs. As the alveolar septa collapse, the surface area for gas exchange is greatly reduced.  
Causes of emphysema:
  - i. Cigarette smoking
  - ii. Inhalation of other smoke or toxic substances over a period of time

OR

- Amylase is secreted by salivary glands and pancreas.
- Salivary glands secrete saliva which contains salivary amylase into the buccal cavity and converts starch to maltose.
- The pancreas secretes pancreatic juice containing pancreatic amylase into the duodenum. It acts on starch and breaks it into maltose.

**10. Features of parasitic Platyhelminthes:**

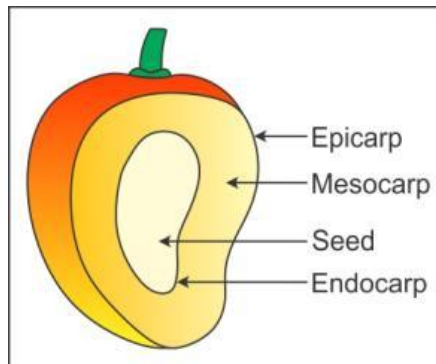
- They have a thick cuticle.
- They lack an alimentary canal and absorb the nutrients directly through their body surface.
- They even show the presence of hooks and suckers.

**11. Differences between fibrous roots and adventitious roots:**

<b>Fibrous roots</b>	<b>Adventitious roots</b>
1. They arise from the radicle which becomes repeatedly branched and a tuft of roots arise from the base of the stem.	1. They arise from any part of the plant, other than the radicle.
2. They are meant for anchorage and absorption.	2. They serve functions like storage, climbing and respiration.
3. They are characteristic of grasses.	3. They are found in a variety of plants.
4. They are usually present below the soil.	4. They may be underground or aerial.

OR

In mango, the pericarp is well differentiated into an outer thin epicarp, a middle fleshy edible mesocarp and an inner endocarp which is stony and hard.



12. Crossing over is the phenomenon of exchange of equivalent segments between non-sister chromatids of homologous chromosomes during prophase I of meiosis. The enzyme recombinase is involved in the phenomenon of crossing over.

**SECTION C**

13.

Intracellular Digestion	Extracellular Digestion
(i) It occurs within the cells. (ii) Only a few enzymes are associated with this digestion. (iii) It occurs in unicellular organisms and some lower organisms.	(i) It occurs outside the cells in the cavity of the alimentary canal. (ii) A large number of digestive glands and enzymes are associated with this digestion. (iii) It occurs in multicellular organisms.

14. In earthworm, four pairs of tubular hearts are present.

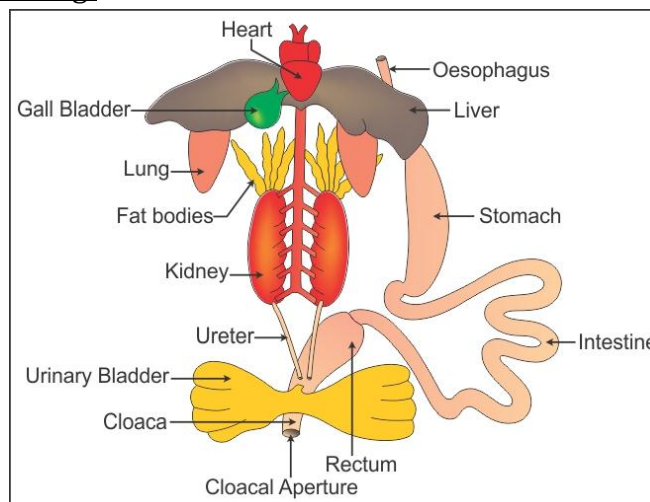
The anterior two pairs of the hearts known as the lateral hearts lie in the 7<sup>th</sup> and 9<sup>th</sup> segments, while the posterior pairs called latero-oesophageal hearts are situated in the 12<sup>th</sup> and 13<sup>th</sup> segments.

**OR**

Exoskeleton of cockroach:

- In cockroach, the exoskeleton is hard, chitinous and brown.
- It is made of hardened plates called sclerites.
- The sclerites present on the dorsal side are called tergites, and the ones present on the ventral side are sternites.
- Tergites and sternites are joined to one another by a flexible, articular membrane called the arthroal membrane.

15. Digestive system of frog:



**16.** Modification of the root is a change in the shape, size, structure and normal functioning of the root to perform some secondary functions or a particular adaptation.

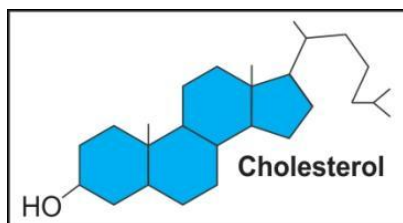
- (a) **Banyan tree:** In banyan trees, long roots develop from branches which go deep down to reach the ground to provide additional mechanical support to the banyan tree. This modification is called a prop root.
- (b) **Turnip:** In turnip, the root is modified to store extra food. This modification is called napiform fleshy tap root.
- (c) **Mangrove trees:** The roots of mangrove trees get modified into pneumatic structures to provide additional oxygen to the plant. This modification of roots is called respiratory roots or pneumatophores.

**17.** Based on the number of amino and carboxyl groups, amino acids are of the following types:

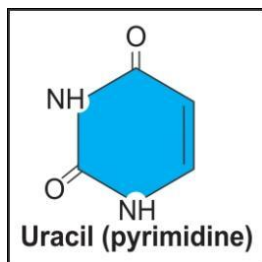
- i. **Acidic amino acids:** These amino acids have an extra carboxylic group. Examples: Glutamic acid and aspartic acid
- ii. **Basic amino acids:** They have an additional amino group without forming amides. Examples: Arginine and lysine
- iii. **Neutral amino acids:** These amino acids have one amino group and one carboxylic group. Examples: Glycine and valine

**OR**

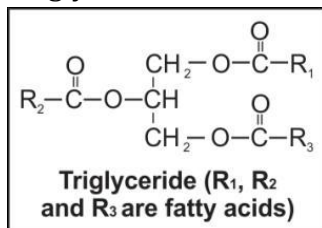
a. Cholesterol



b. Uracil



c. Triglyceride



18.

- i. At several places, the nuclear envelope is interrupted by minute pores formed by the fusion of its two membranes; these pores are referred to as nuclear pores. The nuclear pores serve as the passage for the movement of RNA and protein molecules in both directions between the nucleus and the cytoplasm.
- ii. Interkinesis is the short phase between meiosis I and meiosis II.

19.

- i. Primary structure of protein:
  - The primary structure of protein gives positional information or information about the sequence of amino acids.
  - The left end of the protein chain is represented by the first amino acid (i.e. the N-terminal amino acid) and the right end is represented by the last amino acid (i.e. the C-terminal amino acid).
- ii. Ribose and deoxyribose

20. Glycolysis is the process of partial oxidation of glucose or a similar hexose sugar into two molecules of pyruvic acid through a series of ten enzyme-mediated reactions. The two monosaccharides are glucose and fructose which readily enter the glycolytic pathway.

21. It is the synthesis of energy-rich ATP molecules with the help of energy liberated during oxidation of reduced coenzyme (NADH, FADH<sub>2</sub>) produced in respiration. The enzyme required for this synthesis is called ATP synthase (Complex V). ATP synthase is located in F<sub>1</sub> or the headpiece of the F<sub>0</sub>-F<sub>1</sub> or elementary particle which is present in the inner mitochondrial membrane.

22. Human beings have diphyodont (two sets of teeth—milk or deciduous and permanent), thecodont (teeth are embedded in sockets of the jaw bones) and heterodont teeth (different type of teeth).

An adult human has 32 permanent teeth which are of four different types—incisors (I), canines (C), premolars (PM) and molars (M).

The arrangement of teeth in each half of the upper and lower jaw in the order I, C, PM, M is represented by the dental formula.

The dental formula in human beings is 2123.

**OR**

- The mucus secreted by the goblet cells of the intestinal mucosal epithelium and the secretions of the brush border cells of mucosa are together called succus entericus.
- Enzymes present in the succus entericus act on the products formed during digestion, i.e. dipeptides, disaccharides, monoglycerides and nucleosides, to form simple absorbable products.

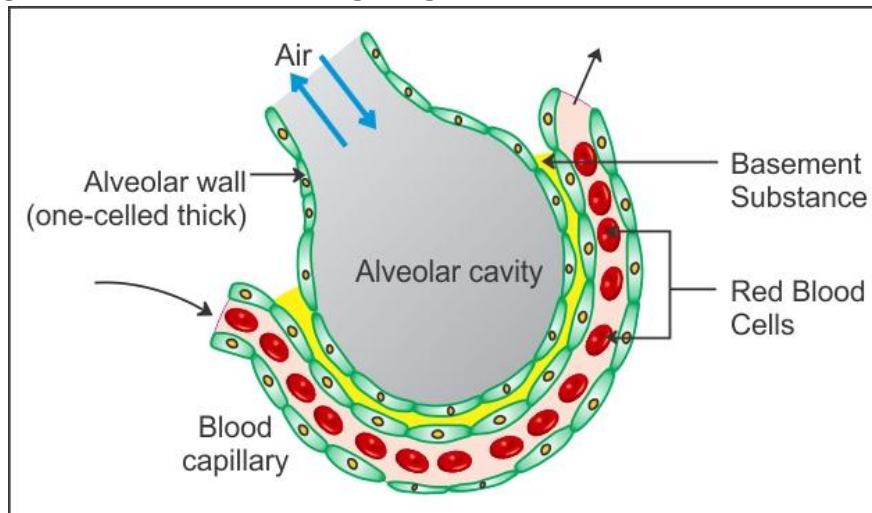
23. The major plasma proteins are fibrinogens, globulins and albumins.

Importance of plasma proteins:

- i. Fibrinogens help in the clotting or coagulation of blood.
- ii. Globulins, also called immunoglobulins, are involved in the defence mechanisms of the body.
- iii. Albumins and globulins retain water and thus help in maintaining the osmotic balance.

**OR**

Alveoli are the primary sites of exchange of gases. The alveolar region has enough pressure gradient to facilitate diffusion of gases. Other regions of the respiratory system do not have the required pressure gradient. Also, the membrane of the alveoli is thin enough to facilitate the exchange of gases in a convenient manner.



24.

- (a) Photorespiration
- (b) Glycerate and carbon dioxide
- (c) Photorespiration occurs in the stroma of chloroplasts, peroxisomes and mitochondria.

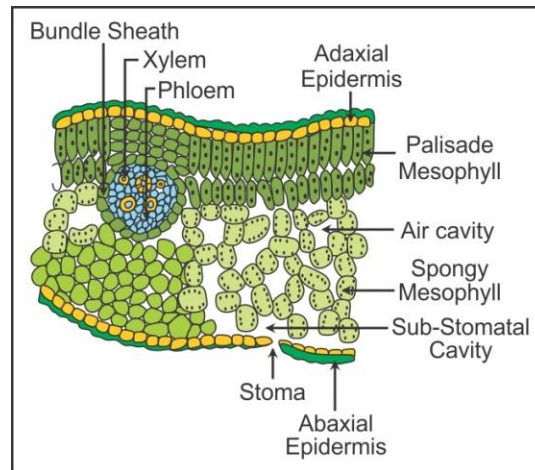
### SECTION D

25. Dorsiventral (dicotyledonous) leaf:

The vertical section of a dorsiventral leaf through the lamina shows three main parts—epidermis, mesophyll and vascular system.

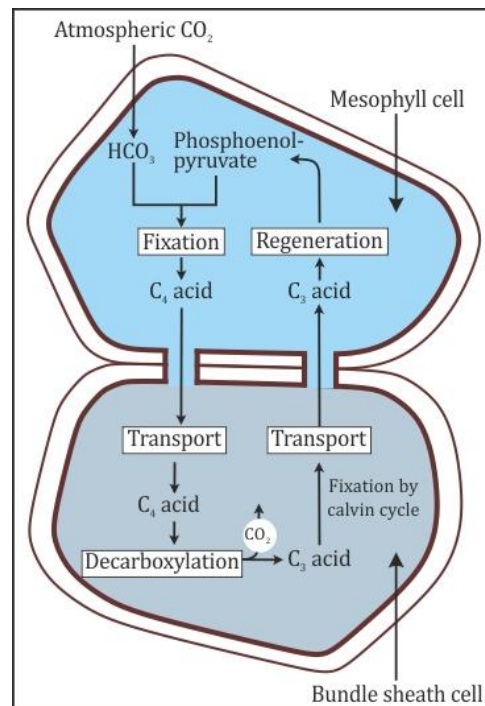
- i. Epidermis: The epidermis has two parts:
  - (a) Upper or adaxial epidermis: It is a single layer composed of a row of compactly arranged parenchyma cells which possesses a thick cuticle on the outer surface of the upper (adaxial) epidermis. Stomata are generally absent in this layer.
  - (b) The lower or abaxial epidermis bounds the leaf on the lower surface and bears stomata.

- ii. Mesophyll: The tissue between the upper and lower epidermis is called the mesophyll. It possesses chloroplasts and carries out photosynthesis. It has two types of cells—palisade parenchyma and spongy parenchyma. The palisade parenchyma is made of elongated cells which are arranged vertically and parallel to each other. The oval or round and loosely arranged spongy parenchyma is situated below the palisade cells and extends to the lower epidermis. There are numerous large spaces and air cavities between these cells.



- iii. Vascular system: It is made of several vascular bundles of varying sizes depending on the venation. These are found at the boundary between the palisade and spongy regions. Each vascular bundle is surrounded by a sheath of compactly arranged parenchyma cells called bundle sheath. The xylem lies towards the upper side of the leaf, while the phloem is found towards the lower surface.

1.

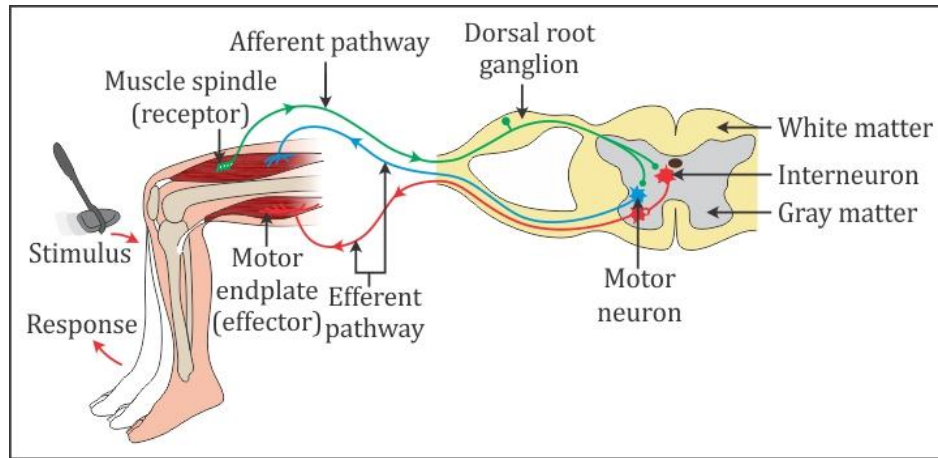


2. Maize and sugarcane
3. Oxaloacetic acid

26.

- i. The path followed by the stimulus up to eliciting a response in a reflex action is called the reflex arc.
- ii. The reflex pathway comprises the following components:
  - (a) Specific receptor
  - (b) Afferent neuron
  - (c) Intermediate or relay neuron
  - (d) Efferent neuron
  - (e) Effector organ

iii.



OR

- i.
  - (a) Basophil
  - (b) Blood platelets
  - (c) Monocyte
  - (d) Eosinophil
  - (e) Neutrophil
- ii. Functions:
  - (a) Basophils release histamine and heparin into the blood.
  - (b) Blood platelets help in blood clotting.
  - (c) Monocytes are phagocytic in action and engulf bacteria and cellular debris.
  - (d) Eosinophils have antihistamine properties.
  - (e) Neutrophils are phagocytic. They engulf microbes.



**27. Polarisation of the membrane of a nerve fibre:**

- At rest, the axon membrane is more permeable to potassium ions than to sodium ions.
- It is impermeable to sodium ions, negatively charged protein and chloride ions.
- The interior/axoplasm is negatively charged and the ECF/exterior is positively charged.
- There exists a potential difference across the membrane, and hence, the membrane is said to be polarised.
- The potential difference across the membrane is called resting potential.

**Depolarisation of the membrane of a nerve fibre:**

- The electrical potential difference which occurs across the membrane of an axon when stimulated by a threshold stimulus is called depolarisation.
- The membrane becomes more permeable to sodium ions than to potassium ions.
- The potential difference in the stimulated/depolarised membrane is called action potential.
- The action potential spreads like a wave along the axon membrane in the form of an impulse or spike.

**OR**

(a) MSH stands for melanocyte-stimulating hormone.

It is synthesised in the pars intermedia of adenohypophysis.

MSH acts on the melanocytes of the skin and regulates the pigmentation of the skin.

(b) Thymosin plays a major role in the differentiation of T-lymphocytes which provide cell-mediated immunity.

They promote production of antibodies for humoral immunity.