SAMPLE QUESTION PAPER–C

Section-A

1. It is a taxonomic aid which gives a comprehensive account of the complete compilation of available information of any one taxon at a given time. **1**

2. Since urochordates have a tunic of tunicin, they are called tunicates. **1**

3. It is the deposition of water impermeable, waxy material, suberin on the tangential and radial walls of the endodermal cells of roots. **1**

4. It is because their functioning cannot be controlled by our will. **1**

5. It is a membrane protein which enables glucose transport into cells. **1**

Section-B

6. The stilt roots are adventitious roots which arise in clusters from the basal nodes just above the ground providing support to the plants. Examples – maize and sugarcane. **2**

7. Those glands which have ducts to pour their secretion into the respective site of action are called exocrine glands. Examples –

(i) salivary glands secrete saliva into the buccal cavity; and

(ii) liver secretes bile into duodenum. **2**

8.

Karyokinesis	Cytokinesis
(i) It is the process of division of nucleus.	It is the process of division of cytoplasm.
(ii) It corresponds to the separation of the daughter chromosomes into two daughter nuclei.	It corresponds to the separation of the two daughter nuclei into two daughter cells.

2

9. It refers to the volume of filtrate formed by the kidneys per minute. It is about 125 ml/min or 180 litres/day. **2**

OR

False fruit is a fruit formed from a part of a flower other than the carpels. It is also called pseudocarp. Example – the strawberry. **2**

10. Light is perceived by the photopigments in the receptors. Light induced dissociation of iodopsin in the cone cells changes the structure of opsin. The potential differences are caused in the photoreceptor cells. This produces a signal that generates action potential in the ganglion cells through bipolar cells. They are transmitted to the optic nerves to the visual cortex of the brain and image formed is recognized. **2**

Section-C

11. The non-protein moiety of a conjugate enzyme is called a cofactor. It makes the protein catalytically active. It is are of three types namely, prosthetic group, coenzyme and metal ions. (Any two) **3**

12. It is the process in which one molecule of glucose is broken down into two molecules of pyruvic acid. Glucose and fructose enter the glycolytic pathway. **3**

13. It is a patch of specialized cardiac muscles. It is located on the right upper corner of right atrium. It is responsible for initiating and maintaining the rate of heart beat. It is also known as pace maker of the heart. **3**

14. For any chemical reaction to take place, a new bond must form. The energy needed to break the old bond is called the activation energy. Many reactants need a large amount of energy to push

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them to take part in a reaction. In the presence of enzymes, the activation energy is greatly lowered allowing the reaction to take place at low temperature. The halfway point in a reaction is called the transition state. The transition state represents the stage when the new bonds are formed. Enzymes lowers the activation energy by making it easier to achieve the transition state. **3**

15.

Gram-negative	Gram-positive
(i) Cell wall is 20-80 nm thick.	Cell wall is 8-12 mm thick.
(ii) It includes few pathogenic bacteria.	It includes most of the pathogenic bacteria.
(iii) Mesosomes are prominent.	Mesosomes are less prominent.
(iv) Have single-layered wall.	Have double-layered wall.
(v) Outer membrane is absent.	Outer membrane is present.
(vi) The bacteria remain coloured blue or purple with gram staining even after washing with alcohol.	The bacteria do not retain stain when washed with alcohol.

3

16. In annelids, the body is composed of many segments which are not by themselves reproductively competent. Such structures as nephridia and setae do occur, but many other structures extend through the entire body of the worm and do not exist as separate structures in each segment. Some examples are the circulatory system and the reproductive system.

In tapeworm, each of the segments is identical, differing only in size. Each segment is derived from the head. The older segments are pushed back by new segments. **3**

17. The universal rules of nomenclature are :

(i) Biological names are normally in Latin and written in Italics. They are latinised or derived from Latin irrespective of their origin.

(ii) First word in a biological name represents genus while the second name denotes species.

(iii) Both the words when written in hands are separately underlined or printed in Italics to indicate their Latin origin.

(iv) First word starts with capital letter while the second word starts with small letter. *e.g.*, *Tamarindus indica.*

(v) Name of the author is written in abbreviation after species name in Roman. *e.g.*, *Homo sapiens* (Linn). **3**

18. Some carrier or transport proteins allow diffusion only if two types of molecules move together. When the transported molecule and the co-transported molecule move in the same direction, the process is called symport. When the two molecules move across the membrane in opposite directions, the process is called antiport. When a molecule moves across a membrane independent of other molecules, the process is called uniport. **3**

19. Night blindness is a vitamin A deficiency characterized by poor vision in dim light. It occurs due to lack of rhodopsin in the rod cells of the retina. It can be remedied by having food materials rich in vitamin A like carrot, papaya etc. **3**

OR

The Brunner's gland secretes mucoid fluid. It has the following characteristics :

(i) It is viscous and enzyme-free.

(ii) It is alkaline.

It enables duodenum to withstand the acid chyme and protects its wall from getting digested. **3**

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20.

	Heart wood	Sap wood
(i)	It is the central, dark coloured non-functional part of secondary xylem of an old stem.	It is the peripheral, light coloured functional part of secondary xylem of an old stem.
(ii)	It is heavier and more durable.	It is lighter and less durable.
(iii)	It has dead parenchymatous cell.	It has living parenchymatous cell.
(iv)	It does not conduct water but gives mechanical to the stem.	It helps in conduction of water and minerals.

3

21. (a) Marginal placentation (b) Axile placentation (c) Parietal placentation (d) Free central placentation and (e) Basal placentation.

Placenta is a tissue within the ovary bearing the ovules. Mustard – parietal placentation and Pea – Marginal **3**

22. Mustard shows raceme inflorescence in which the oldest bisexual flowers with longest pedicel remain at the base and young bisexual flowers with short pedicel remain near the tip of inflorescence axis. Banana shows spadix inflorescence in which the spike with fleshy axis is enclosed by one or more large spathe. **3**

23. (i) A good, regular exercise keep diabetes under check.

(ii) Exercise is also crucial to those who are obese or overweight.

(iii) Weight training exercises increases uptake of calcium in the bones and help in preventing osteoporosis (Bone disease).

(iv) Regular exercise also reduces bad cholesterol in our body and helps in improving the function of the heart.

Associated value : The learners will be motivated to take up sports activities more regularly to keep them healthy. **4**

Section-D

24. Plastids are double membrane bound organelles of different shapes that are found only in plant cells and contain pigments and storage products. They are classified into three types namely :

(i) Leucoplasts – These are oval, spherical, rod-like colourless plastids which are found in storage organs. Their main function is to store reserve materials like starch, proteins and fats.

(ii) Chromoplasts – These are coloured plastids containing yellow, red and orange pigments (carotene and xanthophyll). These are found in petals of flowers and skin of fruits. They attract agents for pollination and dispersal of fruits / seeds.

(iii) Chloroplasts – These are green plastids containing mainly chlorophylls and little carotene and xanthophylls. Their main function is photosynthesis and formation of starch. **5**

OR

There are three stages namely :

(i) G1 phase – It corresponds to the interval between mitosis and initiation of replication of DNA. There is more synthesis of RNAs and proteins which are needed for cell growth and DNA replication.

(ii) S phase – It is the period during which DNA replication takes place. The amount of nucleic acid doubles. In animal cells, the centriole starts its duplication in the cytoplasm.

(iii) G2 phase – It is the phase between the duplication of DNA and the beginning of mitosis phase. During this phase more RNAs and proteins are synthesized for mitosis. **5**

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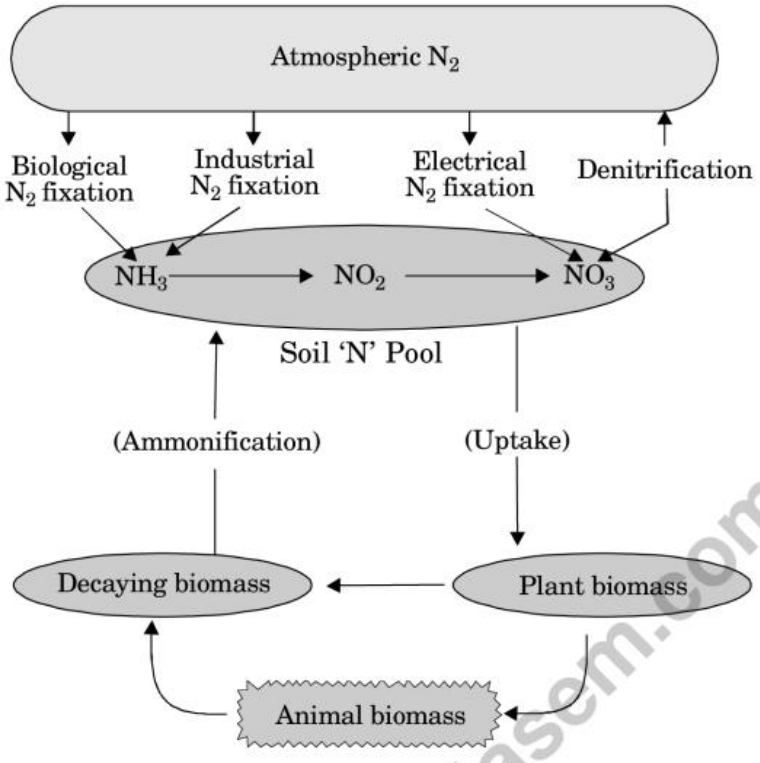
25. Nitrogen fixation is the process by which atmospheric free nitrogen is converted into ammonia and other nitrogen compounds that can be used by plants.



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OR

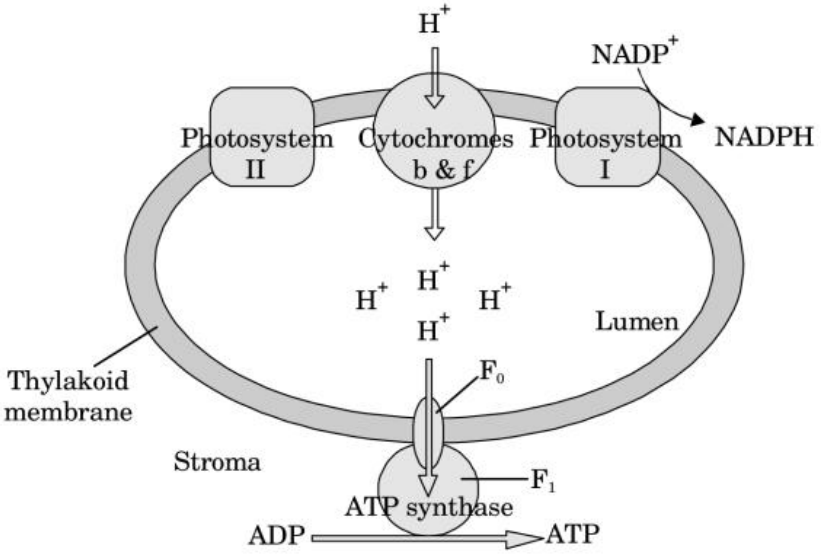
Chemiosmotic Hypothesis :

(i) It was put forward to explain the mechanism of ATP synthesis. ATP synthesis is linked to the development of a proton gradient across the membranes of thylakoids.

(ii) When electrons are transported through ETS, the protons get accumulated inside the thylakoids membrane. These protons are passed across the membrane into stroma because protons are removed from the stroma for two reasons.

(iii) Firstly the primary electron acceptor is located towards the outside of the membrane and transfers its electrons to the H carrier. So this molecule removes a proton from the stroma while transporting an electron and releasing it into the lumen or inner side of the membrane.

(iv) Secondly, the enzyme NADP-reductase is located on the stroma along with the electron from PSI need to be reduced to NADP. Thus as a result, the protons in the stroma get decreased creating a proton gradient across the thylakoids membrane. This gradient is important for ATP synthesis because energy is released by the breakdown of this gradient.



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(v) The gradient gets broken due to the movement of protons across the membrane through trans membrane channel of the ATP synthetase. The other portion of ATP synthetase called F_1 undergoes conformational changes with the energy provided by the breakdown of proton gradient and synthesizes ATP molecules. **5**

26. Digestion of proteins : It takes place in the stomach and small intestine.

In stomach :

(i) Gastric juice contains pepsinogen and pro-rennin.

(ii) These proenzymes are activated by HCl acid present in the gastric juice.

(iii) Pepsin acts on proteins and converts them into proteoses and peptones.

(iv) Rennin hydrolyses milk proteins.

In the intestine :

(i) The substrates of enzymes are pancreatic and intestinal juices. Pancreatic juice contains trypsin, chymotrypsin and carboxypeptidase.

(ii) Trypsin acts on proteins, proteoses and peptones converting them into dipeptides. Chymotrypsin hydrolyses the milk proteins.

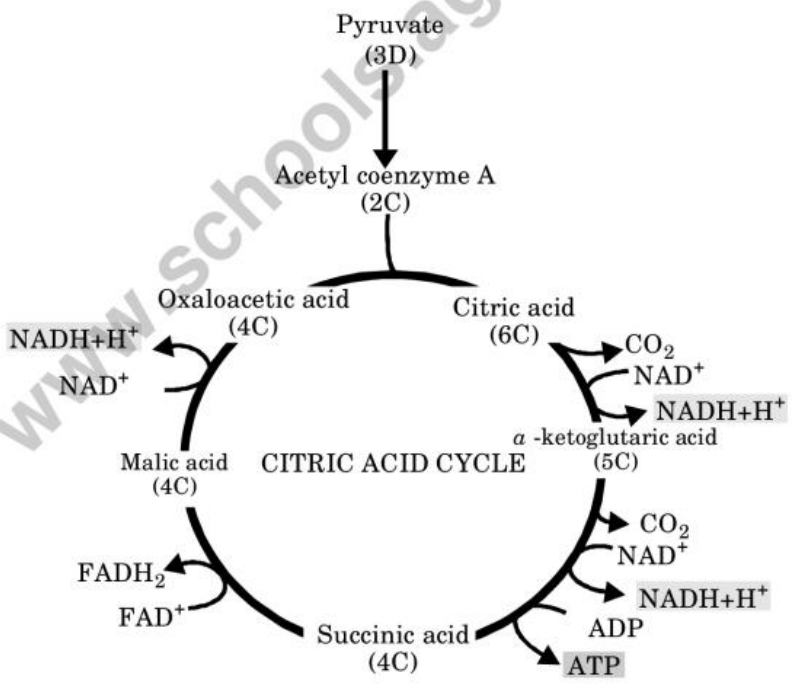
(iii) Carboxypeptidase acts on the terminal peptide bond and releases the last amino acid and progressively shortens the peptide chain.

(iv) Intestinal juice contains enterokinase, amino peptidases and dipeptidases. Enterokinase activates the trypsinogen into active trypsin.

(v) Amino peptidases act on the terminal peptide bond and release the last amino acid and thus shorten the peptide chain.

(vi) Dipeptidases act in the dipeptides and break them into individual amino acids. **5**

OR



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