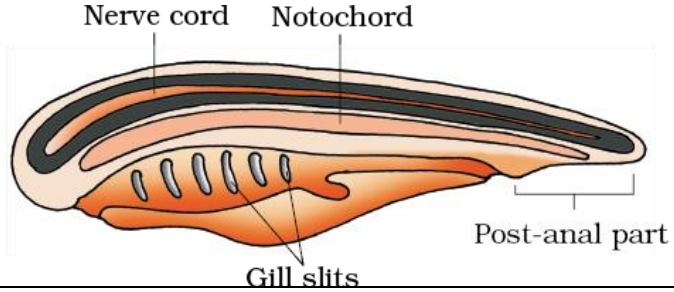
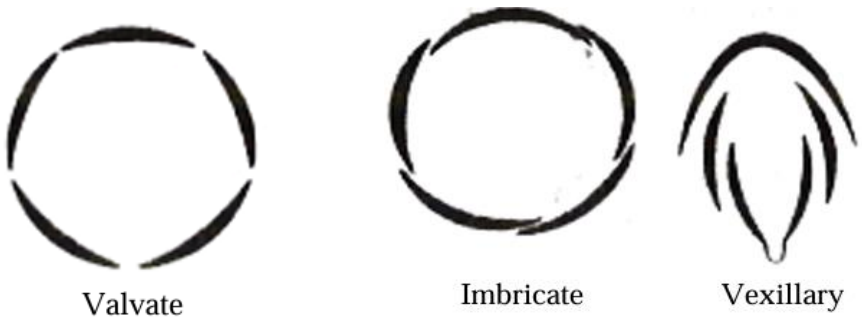
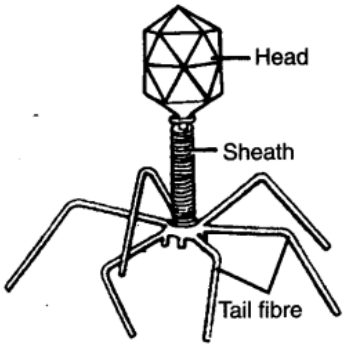
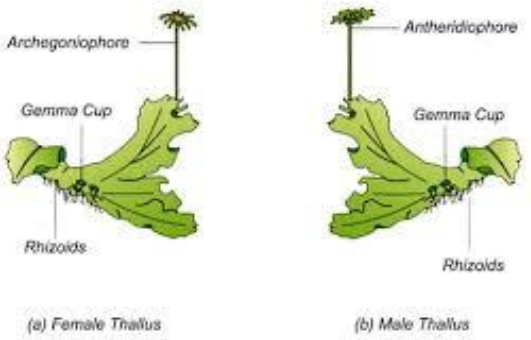
INDIAN SCHOOL AL WADI AL KABIR

FIRST ASSESSMENT (2024 - 25)
ANSWER KEY
SET II
CLASS XI BIOLOGY

Section-A		
Q.No.	Questions	Marks
1.	d) 9+2 pattern	
2.	d) Pachytene	
3.	a) Amino acids	
4.	c) Polysaccharide of glucose	
5.	a) Kingdom → Phylum → Class → Order → Family → Genus → Species	
6.	a) Mycobiont	
7.	c) Fix atmospheric nitrogen	
8.	c) Anisogamy	
9.	b) Coelenterates and Ctenophora	
10.	d) Cytotaxonomy involves only external characteristics	
11.	d) Endosperm gets used up by the developing embryo during seed development	
12.	b) **C** is used to represent the perianth of a flower	
13.	c) A is true but R is false.	
14.	d) A is false but R is true	
15.	a) Both A and R are true and R is the correct explanation of A.	
16.	d) A is false but R is true	
Section-B		
17.	Lysosomes are rich in hydrolytic enzymes (hydrolases- lipases, proteases, carbohydrases). Lysosomes are responsible for intracellular and extracellular digestion, body defence and autophagy. Vacuole is the membrane-bound space found in the cytoplasm. It contains water,	1+1

	sap, excretory products and other material not useful for the cell. They may store food reserve. They are also responsible for the osmoregulation and excretion in some protistan and algal cells. **OR** M. J. Scheilden & Theodore Schwann gave the famous cell theory which states as follows:- (i) All living things are made of cells & cell products. (ii)The cell is the structural & functional unit of all living organisms. (iii) All metabolic reactions in the living things take place within the cell The cell theory was later modified by Rudolf Virchow who stated that "all new cells arise from the pre- existing cells".	
18.	The mitochondria are organelles found in eukaryotic cells that are associated with energy production or with the production of ATP. Mitochondria are made up of two membranes- the outer and the inner membrane. The inner membrane form folds called the cristae that enclose the matrix. **OR** Mesosome in a prokaryotic cell is formed by extensions of plasma membrane into the cell it may be in form of vesicle, tubule or lamella. They help in cell wall formation. They help in replication of DNA & distribution of it to daughter cells. They help in secretion respiration, & increase plasma membrane surface area.	2
19.	**a) Gap 2 (G2) phase:** Cytoplasmic growth occurs. Proteins are synthesised in preparation for mitosis. b) Some cells in the adult animals do not appear to exhibit division (e.g., heart cells) and many other cells divide only occasionally. These cells that do not divide further exist G_1 phase to enter an inactive stage called quiescent stage (G_0) of the cell cycle. Cells in this stage remain metabolically active but no longer proliferate unless called on to do so depending on the requirement of the organism.	1+1
20.		½ x 3=1½ + ½ - labelling
21.	a) Co-factors Inorganic ions or small organic molecules Assist enzymes in catalyzing reactions Co-enzymes Organic molecules derived from vitamins or organic compounds Work alongside enzymes to facilitate reactions **OR**	1+1

	b) i) The tertiary structure of a protein refers to the three-dimensional arrangement of its polypeptide chain in space. The tertiary structure of a protein is formed by coiling and folding of chains of proteins, which are held together by weak non-covalent interactions formed between various parts of the polypeptide chain. ii) Macromolecules are large complex molecules that occur in colloidal state in intercellular fluid. They are formed by the polymerization of low molecular weight micromolecules. Examples of macromolecules are proteins, lipids, carbohydrate and nucleic acids.	1+1
	Section-C	
22.	a) A- Stroma, B- Granum b) Stroma-contains enzymes required for the synthesis of carbohydrates and proteins. It also contains ds circular DNA and ribosomes. Granum- Chlorophyll pigments are present. c) Amyloplasts- stores carbohydrates and elaioplasts- stores oils and fats.	1+1+1
23.	a) Valvate-When sepals or petals in a whorl just touch one another at the margin, without overlapping, as in Calotropis, it is said to be valvate. b) Imbricate- If the margins of sepals or petals overlap one another but not in any particular direction as in Cassia and gulmohur, the aestivation is called imbricate. c) Vexillary- In pea and bean flowers, there are five petals, the largest (standard) overlaps the two lateral petals (wings) which in turn overlap the two smallest anterior petals (keel); this type of aestivation is known as vexillary or papilionaceous.  Valvate Imbricate Vexillary	1+1+1
24.	a) Algal bloom refers to the excess growth of algae especially blue green algae in polluted water. Red tide refers to the red colour imparted to the sea water by the rapid multiplication of dinoflagellates.	1+2

	b)  **Fig. Bacteriophage Virus**	
25.	a) Chordates include Urochordates, Cephalochordates (both are called protochordate), and vertebrates. In vertebrate's notochord is replaced by the vertebral column (backbone), however, the vertebral column is not present in a protochordate. Therefore, all vertebrates are chordates but all chordates are not vertebrates. b) i) Choanocytes/collar cells ii) Parapodia	1+2
26.	 	3
27.	The enzymes are classified into 6 different classes based on the types of reactions they catalyse: Oxidoreductase/ dehydrogenase: Enzymes which catalyse oxidoreduction between two substrates. Transferases: Enzymes catalysing a transfer of a group between a pair of substrates. Hydrolases: Enzymes catalysing hydrolysis of ester, ether, peptide and halides. Lyases: Enzymes that catalyse removal of groups from substrates by mechanisms other than hydrolysis leaving double bonds. Isomerases: Include all enzymes catalysing inter conversion of optical, geometric or positional isomers. Ligases: Enzymes catalysing the linking together of 2 compounds.	Any three- 1+1+1
28.	a) i) Calyx: sepals five, united, persistent, valvate aestivation ii) Corolla: petals five, united; valvate aestivation	1+1+1

	b) **Floral Formula:** $\oplus \, \male \, K_{(5)} \, \overbrace{C_{(5)}} \, A_5 \, \underline{G}_{(2)}$	
	Section-D	
29.	a) Binomial nomenclature is a biological system of naming organisms in which the name is composed of two terms, the first one indicates the genus of the organism and the second indicates the species of the organism. b) i) Mango ii) The term 'Linn' means that this species was first discovered and studied by Linnaeus. c) The first part denotes the genus of the plant while the second part denotes the species. **OR** d) These names are written in italics to show their Latin origin. Moreover, it is a strict rule to write scientific name in italics.	1+2+1
30.	a) Coelenterate/Cnidaria and Echinodermata. b) Jelly fish-marine/free swimming, possess stinging cells, two body forms-poly and medusa occurs. Starfish- Marine, organ system level, triploblastic, water vascular system, indirect development etc. c) Metagenesis is the phenomenon in which organisms exhibit alternation of generation. For eg., Coelenterates. **OR** d) Air bladder regulates buoyancy.	1+2+1
	Section-E	
31.	a) Plants The division of the cytoplasm takes place by cell plate formation. Cell plate formation starts at the centre of the cell and grows outward, toward the lateral walls. Animals The division of the cytoplasm takes place by cell furrow method. Furrow starts at the periphery and then moves inward, dividing the cell into two parts. b) There are two important events that take place during S-phase – one is the synthesis or replication of DNA for maintaining the chromosomal number in the daughter cells and the other is the duplication of the centriole. Hence mitosis can't take place without DNA replication in S-phase as without it, there will be a reduction in the number of chromosomes of daughter cells. c) Synapsis: The pairing of homologous chromosomes is called as synapsis. This occurs during the second stage of prophase I or Zygotene.	2+1+2

	Chiasmata: Chiasmata is the site where two non-sister chromatids have crossed over. It represents the site of cross-over. It is formed during the diplotene stage of prophase I of meiosis. **OR** **a) Anaphase, A- spindle fibres and B- Chromatids** **b)** Anaphase of mitosis: Anaphase is the stage during which, the centromere splits and the chromatids separate. The chromosomes move apart, towards the opposite poles. **Anaphase-I of meiosis:** During anaphase-I, the homologous chromosomes separate, while the chromatids remain attached at their centromeres **c)** Metaphase I- Bivalent chromosomes align on the equatorial plate. Microtubules from opposite poles attach to the kinetochore.	1+2+2
32.	a) Two kingdom classifications did not distinguish between the prokaryotes and eukaryotes They did not distinguish between unicellular and multicellular organisms They also did not distinguish between autotrophic/photosynthetic and heterotrophic/non-photosynthetic organisms. b) *Phycomycetes are obligate parasites that feed on dead and decaying matter. *Ascomycetes are sporophytic and are also defined under decomposition. *Basidiomycetes grow on logs or tree stumps and cause diseases like rust in plants. *Deuteromycetes are a group of fungi that contain sporophytic fungi and parasites. **OR** a) Diatoms have left behind large amount of cell wall deposits in their habitat; this accumulation over billions of years is referred to as 'diatomaceous earth'. Being gritty this soil is used in polishing, filtration of oils and syrups. Diatoms are the chief 'producers' in the oceans. b) **(a) Heterotrophic bacteria** i) They act as decomposers and help in the formation of humus. ii) They help in the production of curd from milk. iii) Many antibiotics are obtained from some species of bacteria. iv) Many soil bacteria help in fixation of atmospheric nitrogen. **(b) Archaebacteria** i) Methane gas is produced from the dung of ruminants by the methanogens. ii) Methanogens are also involved in the formation of biogas and sewage treatment c) Viroids are the smallest known agent of infectious diseases that contain small single-stranded RNA molecule. They lack capsid and have no proteins associated with them. Viroids infect only plants. Whereas, viruses have genetic	2+3 1+2+2

	material surrounded by a protective coat of protein or lipoprotein. The genetic material of viruses are of 4 types – double-stranded DNA, double-stranded RNA, single-stranded DNA, single-stranded RNA. They infect both plants and animals.	
33.	a) Mycorrhiza is a symbiotic association between a fungus and the roots of a vascular plant. Mycorrhiza is found in some genus of gymnosperms; like Pinus. Coralloid Roots: These roots show a symbiotic association but, in this case, the association is with nitrogen-fixing cyanobacteria. Many nodules are formed in the roots giving them coralloid appearance. Examples are Cycas and plants of Leguminosae. b) Red algae contains phycoerythrin pigments. Brown algae contains carotenoids and fucoxanthin besides chlorophyll 'a' and 'c'. The fucoxanthin pigments makes the green colour of the chlorophyll. c) The bryophytes are called amphibians of plant kingdom because these plants live in soil but they require water for fertilization or asexual reproduction. **OR** a) **Protonema** is the first stage in the life cycle of a moss, developing directly from the spore. It consists of creeping, green, branched, and often filamentous structures. **Prothallus** is the gametophyte of pteridophytes like fern that bears sex organs and produces gametes. **b)** *Chlorophyceae* – These are called green algae, due to the presence of pigments chlorophyll a and b. Examples are Chlamydomonas, Spirogyra, and Chara *Phaeophyceae* – Also called as brown algae, they are predominantly marine. They have chlorophyll a, c, carotenoids and xanthophyll pigments. Examples are Dictyota, Laminaria, and Sargassum *Rhodophyceae* – They are the *red* algae because of the presence of the red pigment, r-phycoerythrin. Examples are Porphyra, Gracilaria, and Gelidium.	2+2+1 2+3