CLASS XI

MODEL QUESTION PAPER

BIOLOGY (044)

Maximum Marks: 70 **Time: 3 hours**

General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions. All questions are compulsory.
(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
(iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

	SECTION - A	
Q.No.	**Question**	**Marks**
1.	The level of similarity between organisms increases from a) Kingdom to Species b) Species to Kingdom c) Similarity remains the same d) both a and b	1
2.	Lichens is the mutual association of a) Algae and Fungi b) Cynobacteria and Fungi c) Green algae and Fungi d) Mycorihiza and algae	1

3	Agar is is obtained from *a)* Laminaria b) *Gelidium* c) *Porphyra* d*)* Sargassum	1
4	The water vascular system is a characteristic feature of animals belonging to the phylum a) Porifera b) Cnidaria c) Echinodermata d) Platyhelminthes	1
5.	The cells of this region are very small, thin-walled and with dense protoplasm. They divide repeatedly. a) Root cap b) Region of elongation c) Region of meristematic d) Region of maturation	1
6.	What is the main function of the cork cambium (phellogen) in woody plants? a. Photosynthesis b. Transpiration c. Protection and insulation d. transport	1

7.	Organisms whose body temperature varies with the temperature of the environment are called. a) Poikilotherms b) Cold-Blooded c) Homeotherms d) Both a and b are correct	1
8.	The monomer units of nucleic acids are: a. Amino acids b. Nucleotides c. Monosaccharides d. Fatty acids	1
9.	What is the final electron acceptor in the electron transport chain during aerobic respiration? a. Water b. Glucose c. Carbon dioxide d. Oxygen	1
10.	Which plant hormone plays a crucial role in the formation and shedding of leaves and fruits? a. Auxin b. Gibberellin **c.** Ethylene d. Abscisic acid	1

11.	During exhalation, which of the following processes occurs? a. Rib cage expands, lowering air pressure in the lungs b. Diaphragm contracts, increasing lung volume c. Diaphragm relaxes, decreasing lung volume d. Air is drawn into the lungs	1
12	What is the name of the valve located between the left atrium and the left ventricle? a. Tricuspid valve b. Bicuspid valve (mitral valve) c. Pulmonary valve d. Aortic valve	1

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true and R is not the correct explanation of A.
C. A is true but R is false.
D. A is False but R is true.

13.	Assertion: The portion of the myofibril between two successive 'Z' lines is considered as the functional unit of contraction called sarcomere. Reason: During contraction, 'I' bands get reduced whereas 'A' bands retain the length, thereby causing shortening of the sarcomere.	1
14.	Assertion: Comparative to uric acid, urea is a more toxic excretory substance. Reason: Birds and insects are uricotelic animals.	1
15.	Assertion: Multipolar neurons have two or more axons and one dendrite. Reason: Multipolar neurons are found usually in the embryonic stage.	1
16.	Assertion: Adrenal medulla is called the gland for 'fight, fright and flight'. Reason: The hormones adrenaline and noradrenaline help the body to combat against stress and emergency conditions.	1

	SECTION - B	
17.	Apart from chlorophyll, algae have several other pigments in their chloroplast. What pigments are found in red and brown algae responsible for their characteristic colours?	2
18.	Define aestivation.Which type of aestivation is found in China rose, Gulmohar, *Calotropis* and pea.	2

19	Give the specific terms for the following : (a) Cluster of ribosomes found in cytoplasm (b) Extensive infolding in the inner membrane of mitochondria (c) Stacks of closely packed thylakoids (d) Stalked particles on the inner membrane of mitochondria	2

20	What is cell cycle ? Explain the events occurring in this cycle.	2
21	Give any two points of difference between cyclic and non-cyclic Photophosphorylation.	2
	SECTION - C	
22	"All vertebrates are chordates but all chordates are not vertebrates". Justify the statement.	3
23	List the difference between the internal structure of dicot stem and monocot stem.	3
24	The ribosomes of prokaryoters are of 70 S type ribosomes and while of eukaryotes are of 80 S type as well as 70 S types. (a) Give the composition of 70 S type ribosomes and 80 S type ribosome (two sub units, from each of them are made of) (b) Name two cell organelles of eukaryotic cells which have their own independent ribosomes of 70 S type (c) Explain the process of Translation in context to Ribosome.	3

25	Pyruvic acid is the end product of glycolysis. What are the three metabolic fates of pyruvic acid under aerobic and anaerobic conditions ?	3
26	What makes the synovial joints freely movable ? List any four types of synovial joints. **Or,** How are actin and myosin filament arranged in a muscle fibre ?	3
27	Draw a diagram showing schematic plan of blood circulation in human, Also explain double circulation.	3
28	Describe how urine is formed in the nephron through filtration reabsorption and secretion. **Or,** Explain the steps involved in the process of urine formation.	

	SECTION - D	
Q.No. 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.		
29	Connective tissues are most abundant and widely distributed in the body of complex animals. They are named connective tissues because of their special function of linking and supporting other tissues/organs of the body. They range from soft connective tissues to specialised types, which include cartilage, bone, adipose, and blood. In all connective tissues except blood, the cells secrete fibres of structural proteins called collagen or elastin. The fibres provide strength, elasticity and flexibility to the tissue. These cells also secrete modified polysaccharides, which accumulate between cells and fibres and act as matrix (ground substance). Connective tissues are classified into three types: (i) Loose connective tissue, (ii) Dense connective tissue and (iii) Specialised connective tissue Loose connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, areolar tissue present beneath the skin. Often it serves as a support framework for epithelium. It contains fibroblasts (cells that produce and secrete fibres), macrophages and mast cells. Adipose tissue is another type of loose connective tissue located mainly beneath the skin. The cells of this tissue are specialised to store fats. The excess of nutrients which are not used immediately are converted into fats and are stored in this tissue. Fibres and fibroblasts are compactly packed in the dense connective tissues. Orientation of fibres show a regular or irregular pattern and are called dense regular and dense irregular tissues. In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres. Tendons, which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of this tissue. Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently. This tissue is present in the skin. Cartilage, bones and blood are various types of specialised connective tissues. 1.) The tissues which has cells with the presence of loosely arranged fibres in a semi-fluid ground substance are termed as a) Dense connective tissue b) Loose connective tissue c) Loose arranged tissue d) All of the above 2.) _____ Tissue present just below the skin serves as a cementing framework for epithelium. a.) Adipose tissue b) Aeolic tissue c) Areolar tissue d) Fibroblast cells	4

	3.) _____tissues has collagen fibres present in rows between many parallel bundles of fibres. a.) Dense regulated connective tissues b) Dense regular connective tissues c) Dense irregular connective tissues d) Dense regularise connective tissues 4.) Name the tissue which is specialised to stores the skin fat. Give its function. Or, Why connective tissue is named as connective tissue?	

30.	Photosystems are of two types, PS 1 and PS 11, and are found in thylakoid membranes. Each photosystem consists of a light harvesting complex and each LHC is made up of hundreds of pigment molecules bound to proteins. Each photosystem has all the pigments complexes except one molecule of chlorophyll a.,a single chlorophyll forms a reaction centre. Each photosystem absorbs different wavelengths of light. In PS I the reaction centre chlorophyll a has an absorption peak at 700 nm, hence is called P700, while in PS II it has absorption maxima at 680 nm, and is called P680. It was named PSII because it was discovered after PSI was discovered. Only light reaction takes place in these systems. PSII is the first system which traps light and the most important function is splitting of water and molecular oxygen. The electron is released while the splitting of water. These electrons are passed through PSII and PSI before ending up in NADPH as they move down in the electron transport chain. NADPH, thus produced is used in the dark reaction of photosynthesis. (i) Photosystem I and II respectively are found in _____ (a) Inner and outer surface of thylakoid in mitochondria (b) Outer and inner surface of thylakoid in mitochondria (c) Inner and outer surface of thylakoid in chloroplast (d) Outer and inner surface of thylakoid in chloroplast (ii) Will photolysis of water occur in PSI? (Yes/No) Or, And The dark reaction cannot take place during the day. (True/False) (iii) What is the correct sequence? I. Antenna molecule 700 II. NADPH III. PSI IV. PSII V. Thylakoid membrane (a) I, II, III, IV, V (b) II, III, IV, I, V (c) V, IV, III, I, II (d) V, III, IV, I, II (iv) Which one of the following is not true about the light reaction in photosynthesis?	4

	SECTION - E	
31	Explain the process of exchange of gases with the help of a diagrammatic representation in human respiratory system. Or, Explain the mechanism of breathing with the help of labelled diagram involving both stages—inspiration and expiration.	5
32.	Write short notes on the functions of the following hormones(any five). a) Parathyroid hormone (PTH) b) Thyroid hormones c) Thymosins d) Androgen e) Estrogens and Progesterone f) Insulin and glucagon	5
33.	Write short notes on (any five)- • Cerebrum • Retina • Ear ossicles • Synapse • Medulla oblongata • Depolarization	5