10th Class 2021		
Biology	Group-II	Paper-II
Time: 1.45 Hours	(Subjective Type)	Max. Marks: 48

(Part-I)

2. Write short answers to any FIVE (5) questions: (10)

(i) Differentiate between breathing and cellular respiration.

Ans The term breathing is used for the process through which animals take air in their bodies to get oxygen from it and then give out the air for getting rid of carbon dioxide. Whereas cellular respiration is the process in which the C-H bonds in food are broken by oxidation-reduction reactions and the energy is transformed into ATP.

(ii) Define pneumonia.

Ans Pneumonia is an infection of lungs. If this infection affects both lungs, then it is called double pneumonia. The most common cause of pneumonia is a bacterium, streptococcus pneumoniae.

(iii) Write the effect of smoking on circulatory system.

Ans Smoking also has effects on the circulatory system. The carbon monoxide present in tobacco smoke lessens the oxygen-carrying capacity of haemoglobin. Many other chemicals in smoke increase the production of blood platelets. When platelets are more than the normal numbers, they make the blood viscous and it can lead to arteriosclerosis.

(iv) Differentiate between renal cortex and renal medulla.

Ans

Renal cortex	Renal medulla
1. Renal cortex is the outer part of kidney.	1. Renal medulla is the inner part of kidney.
2. It is dark red in colour.	2. It is pale red in colour.

(v) What is tubular secretion?

Ans The third step in urine formation is the tubular secretion. Different ions, creatinine, urea, etc. are secreted from blood into the filtrate in renal tubule. This is done to maintain blood at a normal pH / 7.35 to 7.45.

(vi) What is ganglion?

Ans In certain parts of body, the cell bodies of many neurons form a group enveloped by a membrane. This is called ganglion.

(vii) What is meant by brain stem?

Ans The medulla oblongata, pons, and midbrain connect the rest of brain to spinal cord. They are collectively referred to as brain stem.

(viii) Write any two functions of spinal cord.

Ans Spinal cord performs two main functions:

1. It serves as a link between body parts and brain. Spinal cord transmits nerve impulses from body parts to brain and from brain to body parts.
2. Spinal cord also acts as a coordinator, responsible for some simple reflexes.

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3. Write short answers to any FIVE (5) questions: (10)

(i) Define skeleton.

Ans Skeletal system or skeleton is defined as "The framework of hard, articulated structures that provide physical support, attachment for skeletal muscles, and protection for the bodies of animals."

(ii) What are osteocytes?

Ans Bones contain different types of cell. The mature bone cells are called osteocytes.

(iii) Define reproduction.

Ans Reproduction is defined as "The production of individuals of the same species *i.e.*, the next generation of species."

(iv) Define parthenogenesis.

Ans Parthenogenesis is considered as a form of asexual reproduction. In it, an unfertilized egg develops into new offspring. Some fishes, frogs and insects reproduce by means of parthenogenesis.

(v) Define inheritance.

Ans Inheritance means the transmission of characteristics from parents to offspring. These characteristics are called the traits."

(vi) What is transcription?

Ans During protein synthesis, the sequence of DNA nucleotides decides that what will be the sequence of amino acids. For this purpose, the specific sequence of DNA nucleotides is copied in the form of messenger RNA (mRNA) nucleotides. This process is called transcription.

(vii) Write down characteristics of pea plant.

Ans Characteristics of pea plant:

1. Pea plant has contrasting traits.
2. It has a number of different traits that can be studied.
3. It has a short but fast life cycle.

(viii) What is Punnett square?

Ans The Punnett square is a diagram that is used to predict an outcome of a particular cross or breeding experiment. It is named after R.C. Punnett (an English mathematician). The gametes of both parents having all possible genetic set-ups are determined, A checker board is used to cross all the possible gametes of one parent with all the gametes of other parent. In this way, a biologist can find all the possible genotypes of offsprings.

4. Write short answers to any FIVE (5) questions: (10)

(i) What is meant by ecosystem? Give two examples of natural ecosystem.

Ans **Ecosystem:**

The self-sufficient unit of an environment that is formed as a result of interactions between its biotic community and the abiotic components is known as ecosystem.

A pond, a lake and a forest are examples of natural ecosystems.

(ii) Differentiate between population and community.

Ans

Population	**Community**
A group of the organisms of the same species inhabiting a specific geographical area (habitat) at a particular time is called a population.	The organisms of all the populations that live in a habitat and interact in various ways with one another are collectively called as community.

(iii) Define food chain and give an example.

Ans The series of organisms in an ecosystem, in which an organism eats the preceding one and is eaten by the next one. For example;

Grass → Grasshopper → Sparrow → Hawk

(iv) Write the symptoms of dengue fever.

Ans In severe cases, the virus affects liver and bone marrow. As a result, there is a decrease in the production of blood platelets and patient suffers from bleeding. Other symptoms of dengue include high fever, severe headache, pain behind the eyes, muscle and joint pains and rash.

(v) Define biotechnology.

Ans Biotechnology is defined as "The use of living organisms in processes for the manufacture of useful products or for services."

(vi) Write the uses of ethanol.

Ans Uses of ethanol:

1. It is used as solvent.
2. It is used in the production of vinegar and beverages.

(vii) What are synthetic drugs? Give an example.

Ans Such drugs do not occur naturally but are synthesized in laboratory. Pharmaceutical companies produce these drugs *e.g.*, aspirin.

(viii) Define antibiotics and give an example.

Ans Antibiotics inhibit or kill bacteria and treat bacterial infections *e.g.*, tetracycline, cephalosporin, etc.

(Part-II)

NOTE: Attempt any TWO (2) questions.

Q.5.(a) Describe the osmoregulatory function of kidney. (4)

Ans For Answer see Paper 2018 (Group-II), Q.5.(a).

(b) Describe the components of human skeleton. (5)

Ans **Components of Human Skeleton:**

The 206 bones in the adult human skeleton are organized into a longitudinal axis *i.e.*, axial skeleton, to which appendicular skeleton is attached.

(a) Axial Skeleton:

Axial skeleton consists of the 80 bones in the head and trunk of body. It is composed of five parts. Skull contains 22 bones out of which 8 are cranial bones (enclosing the brain) and 14 are facial bones. There are 6 middle ear ossicles (3 in each ear). There is also a hyoid bone in neck. Vertebral column contains 33 bones (vertebrae). The chest is made of a chest bone called sternum and 24 (12 pairs) ribs.

(b) Appendicular Skeleton:

Appendicular skeleton is composed of 126 bones. Pectoral (shoulder) girdle is made of 4 bones. Arms have 6 bones. Both hands have 54 bones. Pelvic girdle (hips) has 2 bones. Legs have 6 bones. Both feet have 54 bones.

Q.6.(a) Describe the structure of a neuron. (4)

Ans Nerve cell or neuron is the unit of the nervous system. The human nervous system consists of billions of neurons plus supporting (neurongilial) cells. Neurons are specialized cells that are able to conduct nerve impulses from receptors to coordinators and from coordinators to effectors. In this way, they communicate with each other and with other types of body cells.

Dendrites and Axons:

The nucleus and most of the cytoplasm of a neuron is located in its all body. Different processes extend out from cell body. These are called dendrites and axons. Dendrites conduct impulses toward cell body and axons conduct impulses away from cell body.

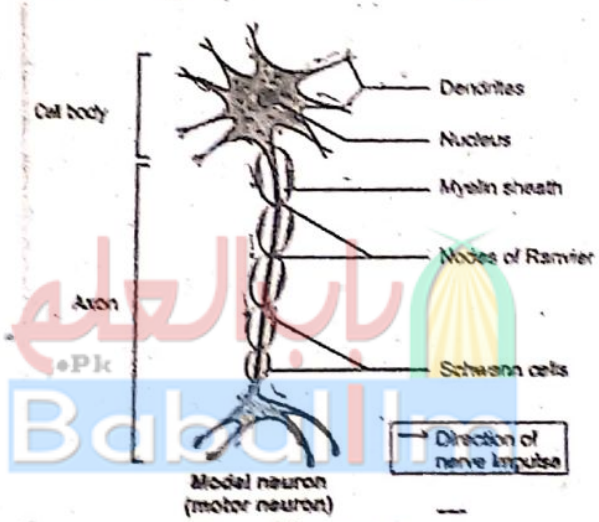

Fig. Neurons.

Schwann Cells:

Schwann cells are special neurogilial cells located at regular intervals along axons.

Myelin sheath:

Schwann cells secrete a fatty layer called myelin sheath, over axons.

Nodes of ranvier:

Between the areas of myelin on an axon, there are non-myelinated points, called the nodes of ranvier.

Saltatory impulses:

Myelin sheath is an insulator so the membrane coated with this sheath does not conduct nerve impulse. In such a neuron, impulses 'jump' over the areas of myelin going from node to node. Such impulses are called saltatory (jumping) impulses. This increases the speed of nerve impulse.

(b) Explain various methods of artificial vegetative propagation in plants. (5)

Ans Artificial Vegetative Propagation:

Gardeners and farmers use artificial methods of vegetative propagation to increase the stock of a plant. The following two are the most common methods of artificial vegetative propagation:

1. Cuttings:

In this method, cuttings may be taken mainly from the stems or roots of parent plant. These cuttings must have a meristematic region from which growth can occur. When cuttings are placed in a suitable soil and under right conditions (sufficient nutrients, water and sunlight), they form roots and shoots. Roots and shoots grow and develop into a plant identical to the parent plant from which the cuttings were taken. Roses, ivy and grapevines are propagated by stem cuttings. Sweet potato is an enlarged root. Farmers place it in moist sand or soil until it produces several plantlets. Then the plantlets are removed and planted.

This process is used to produce many plants from a single plant. All new plants are exactly the same. This artificial vegetative propagation has been very beneficial on sugar cane plantation.

2. Grafting:

In grafting, a piece of stem is cut from the plant and is attached with another plant with established root system. After a while, the vascular bundles of the attached

stem piece and the host plant are connected to each other. The stem piece and the plant begin to grow together. This method is used to propagate many roses, peach trees, plum trees and various seedless fruits (including grapes).

Q.7.(a) Describe four sources of medicinal drugs giving examples. (4)

Ans For Answer see Paper 2021 (Group-I), Q.7.(a).

(b) Define fermentation and describe its industrial products. (5)

Ans Fermentation is the process in which there is incomplete oxidation-reduction of glucose. Fermentation has been in the knowledge of man since centuries, but it was believed that it is purely a chemical process.

In 1857, Pasteur convinced the scientific community that all fermentations are the results of microbial activity. He showed that fermentation is always accompanied by the development of microorganisms. There are many kinds of fermentation and each kind is a characteristic of particular microbial group.

Fermentation are classified in terms of the products formed. The initial steps of carbohydrate fermentation are identical to those of respiration. The process begins with glycolysis, in which the glucose, molecule is broken into two molecules of pyruvic acid. Different microorganisms proceed the further reactions in different ways. It results in the formation of various products from pyruvic acid.

The two basic types of carbohydrate fermentation are described next:

1. Alcoholic Fermentation (by yeast):

This fermentation is carried out by many types of yeast such as Saccharomyces cerevisiae. This process is quite important and is used to produce bread, beer, wine and distilled spirits. In this process, carbon dioxide is

removed from pyruvic acid. The product *i.e.*, acetaldehyde is then reduced to ethanol. The carbon dioxide produced during this fermentation causes the rise of the bread.

2. Lactic Acid Fermentation (by bacteria)

In this process, pyruvic acid is reduced to lactic acid. It is carried out by many bacteria *e.g.*, Streptococcus and many Lactobacillus species. It is quite important in dairy industry where it is used for souring milk and also for production of various types of cheese.