MT

2017 ___ ___ 1100

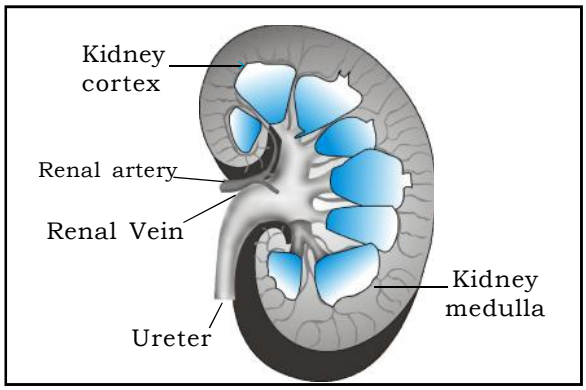
MT - SCIENCE & TECHNOLOGY - II (72) - SEMI PRELIM - II : PAPER - 4

Time : 2 Hours **Model Answer Paper** **Max. Marks : 40**

A.1.	**(A) Fill in the blanks:**	
(1)	Lymph flows in **one** direction.	**1**
(2)	**Plants** do not possess a nervous system.	**1**
(3)	**Ethanol** is produced by fermentation of wheat, maize, potatoes or sugarcane.	**1**
A.1.	**(B) State whether the following statements are true or false and if false, write the correct statement:**	
(1)	**False** - Lymph is called the tissue fluid.	**1**
(2)	**False** - Afferent nerves carry impulses from the sensory organs to the brain.	**1**
A.2.	**Rewrite the following statements by selecting the correct alternative:**	
(1)	While preparing a temporary stained mount of leaf epidermal peel, the extra stain is removed by **soaking with filter paper**.	**1**
(2)	(c) by iodine test	**1**
(3)	**Gibberellins** hormones help in the growth of the stem.	**1**
(4)	Human heart weighs about **360 gm**.	**1**
(5)	Loss of water in the form of water vapour from aerial parts of plants is known as **transpiration**.	**1**
A.3.	**Answer the following in short : (Any 5)**	
(1)	(i) The alimentary canal begins with the mouth. (ii) The food is processed in the mouth to generate particles with small size. (iii) Such crushed food is wetted with saliva secreted by the salivary glands so the food can smoothly pass through the soft lining of the alimentary canal. (iv) The food that we take is of complex nature. It is converted into	**2**

simpler molecules with the help of biological catalysts called as enzymes. Enzyme salivary amylase breaks down starch into a simple sugar maltose. Thus digestion starts in the mouth itself.

(2) **Vertical section of kidney :** **2**



(3) **Autotrophic nutrition :** **2**

(i) Autotrophic nutrition is the mode of nutrition in which organisms synthesize their own organic food.
(ii) They use simple inorganic substances present in the surroundings for this process.
(iii) Such organisms are called autotrophs. Most of the plants are autotrophs.

(4) **2**

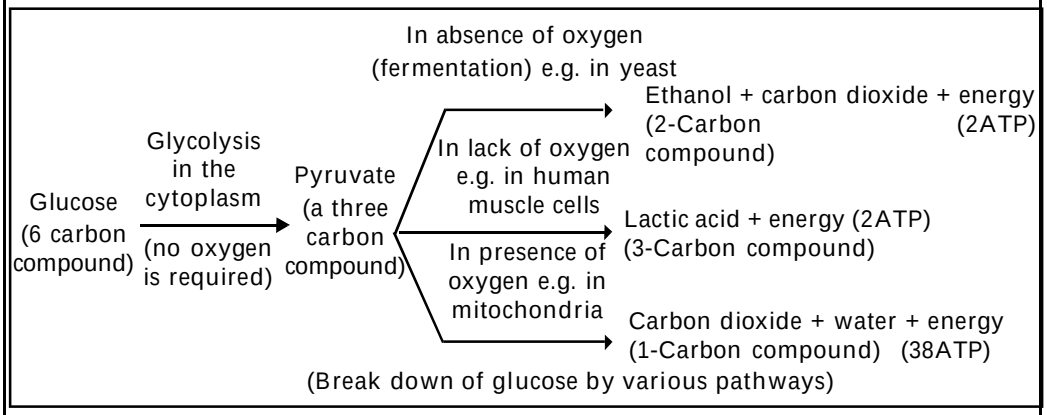
Growth dependent movements	**Growth independent movements**
(i) Growth dependent movements result in growth of the plants.	(i) Growth independent movements do not result in growth of the plants.
(ii) Growth dependent movements are also called as tropic movements.	(ii) Growth independent movements are also known as nastic movements.
(iii) Growth dependent movements are in response to the stimulus of light, water, gravity etc.	(iii) Growth independent movements are in response to the stimulus of touch.
(iv) e.g. Bending of stem towards light, movement of roots towards gravity and water.	(iv) e.g. Closing of leaflets in mimosa plant, shutting of Venus flytrap.

(5) (i) Hormones are secreted by endocrine glands or ductless glands. **2**
(ii) These glands do not have any duct to store or transport their secretions.

	(iii) Thus, on production these hormones are directly released into the blood stream. (iv) Due to this, the hormones reach everywhere in the body, though the gland secreting them is located in a particular place.	
(6)	**Functions of MPCB:** (i) To plan comprehensive programmes for the prevention, control or abatement of pollution. (ii) To inspect sewage or trade effluent treatment and disposal facilities. (iii) To support and encourage the developments in the fields of pollution control, waste recycle reuse, eco-friendly practices, etc. (iv) To educate and guide the entrepreneurs in improving environment by suggesting appropriate pollution control technologies and techniques. (v) To create public awareness about the clean and healthy environment and consider the public complaints regarding pollution.	**2**
(7)	**E-waste :** (i) E-waste is 'electronic waste' generated by electronic products nearing their useful life. (ii) Discarded computers, televisions, printers, fax machines, cell phones, audio equipment, paramedical equipments, etc. lead to e-waste. (iii) E-waste is considered hazardous to human life and environment and can leach lead and other substances into soil and groundwater. (iv) Many of these products can be reused, refurbished, or recycled in an environmentally sound manner so that they are less harmful to the ecosystem.	**2**
A.4.	**Answer the following in brief : (Any 5)**	
(1)	The Water Act defines water pollution and water quality control standards. It prescribes penalties to the offenders. Objectives of the Act: (i) To prevent and control water pollution. (ii) To maintain or restore the wholesomeness of water. (iii) To establish boards for the prevention and control of water pollution.	**3**
(2)	Salient features of The Biomedical Waste Rules: (i) These rules deal with the generation, handling, treatment and disposal of biomedical waste.	**3**

	(ii) These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose or handle biomedical waste in any form. (iii) It is the duty of the occupant to take all steps to ensure that such waste is handled without any adverse effect to human health and environment.	
(3)	The human nervous system can be divided into : (i) The Central Nervous System (CNS) : It comprises of the brain and spinal cord and regulates all activities of the body. (ii) The Peripheral Nervous System (PNS) : It includes all the nerves. The nerves form a network and spread throughout the body. They are instrumental in connecting all parts of the body to the central nervous system. (iii) The Autonomic Nervous Sytem (ANS) : It comprises of all the nerves present in the involuntary organs like heart, stomach, lungs etc. (iv) On the basis of their function, the nerves are categorized as afferent and efferent nerves. (v) The nerves are composed of neurons and neuroglia. The neurons are specialized cells capable of creating and transmitting electrochemical impulses. The neuroglia are supportive cells which assist the neurons in their function.	**3**
(4)	The functions of the forebrain are - (i) It is the main thinking part of the brain. (ii) It has sensory areas where information is received from sense organs. (iii) It has motor areas from where impulses are sent to muscles or effector organs. It controls voluntary actions. (iv) It has centres for visual reception, auditory reception, touch, smell, temperature etc. (v) It has centres known as association areas which put together the information received from other receptors as well as information that is already stored in the brain. (vi) It is also the site for intelligence.	**3**
(5)	(i) Plants do not have definite excretory system or organ for removal of wastes. (ii) Gaseous excretory materials are eliminated by diffusion. (iii) Many plant waste products are stored in the vacuoles of the leaves, flowers, fruits and even in the bark that falls off. Other waste products are stored as resins and gums in old xylem. (iv) Plants also excrete some waste substances in the soil around them.	**3**

	(v) In some plants, waste is in the form of calcium oxalate crystals called as raphides. These are needle shaped and therefore hurt and cause itching. (vi) Some plant wastes are very useful to human beings. e.g. rubber latex, gum, resins and essential oils like eucalyptus or sandalwood oil.	
(6)	The process of release of energy from the assimilated food is called respiration. Respiration is a complex process which involves two distinct phases as follows : (i) Breathing or external respiration : Breathing involves movement which brings the air into the lungs and expels the air containing more of carbon dioxide from the lungs to the outer environment. External respiration is a physical process. (ii) Cellular or internal respiration : It takes place in the mitochondria of the cells to release energy in the form of ATP. It is a biochemical process.	**3**
(7)	(i) Many factors like injury, infections or restricted blood flow to kidneys reduce the activity of kidneys. (ii) This leads to accumulation of poisonous wastes in the body which may lead to death. (iii) In case of kidney failure, an artificial device is used to remove the nitrogenous waste products from the blood. This process is called haemodialysis. (iv) At one time 500 ml of blood is passed through the dialyzing machine. The purified blood is pumped back into the body of the patient.	**3**
A.5.	**Anwser in detail: (Any 1)**	
(1)	(i) Cellular respiration is a biochemical process in which the simple nutrients like glucose are oxidized within the cells to release energy. (ii) This process takes place in the mitochondria of the cells and involves a series of biochemical reactions. (iii) The process of cellular respiration varies greatly in different organisms yet the first step is common in all. The six carbon molecule glucose ($C_6H_{12}O_6$) is broken down in the cytoplasm into a three carbon molecule called pyruvate. This processs is anaerobic and is called glycolysis. (iv) The energy released during cellular respiration is used to synthesize ATP which is used to fuel all other activities in the cell. (v) The energy released during aerobic respiration is more than the energy released during anaerobic respiration.	**5**



(2) (i) The human heart is a muscular organ which pumps blood. **5**

(ii) The heart is covered by the pericardial membrane.

(iii) It is of the size of a human fist and weighs about 360 gm.

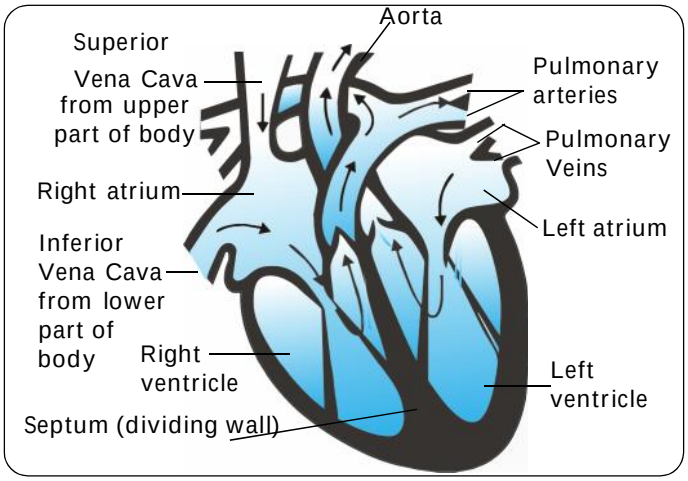
(iv) As oxygen and carbon dioxide both have to be transported by the blood, the heart has different chambers, the left and the right, to prevent oxygen rich blood from mixing with the blood containing carbon dioxide.

(v) The left half carries oxygenated blood whereas the right half carries deoxygenated blood. Such separation allows a highly efficient supply of oxygen to the body.

(vi) This is very essential in animals that have high energy needs, such as birds and mammals, which constantly use energy to maintain their body temperature.

(vii) Each half is further divided into two chambers. The upper one is called atrium and the lower one is termed as the ventricle. Therefore the human heart has four chambers.

(viii) There are valves between the atria and ventricles which ensure that the blood does not flow backwards.



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