

# MT

2017 \_\_\_\_ 1100

MT - SCIENCE & TECHNOLOGY - II (72) - SEMI PRELIM - II : PAPER - 6

Time : 2 Hours

Model Answer Paper

Max. Marks : 40

<b>A.1. (A) Fill in the blanks:</b>		
(1) In some plants, waste is in the form of calcium oxalate crystals called as <b>raphides</b> .		1
(2) <b>Control</b> refers to the systematic regulation of various activities.		1
(3) The unused sugar is stored as <b>glycogen</b> in the liver.		1
<b>A.1. (B) State whether the following statements are true or false and if false, write the correct statement:</b>		1
(1) True		1
(2) True		1
<b>A.2. Rewrite the following statements by selecting the correct alternative:</b>		
(1) Leaf is boiled in alcohol kept in a water bath because <b>alcohol catches fire on heating directly</b> .		1
(2) Fermentation is a type of <b>anaerobic respiration</b> .		1
(3) <b>Abscissic acid</b> is a plant hormone which is responsible for wilting of leaves.		1
(4) To absorb CO <sub>2</sub> and create partial vacuum in the flask.		1
(5) <b>Mucus</b> protects the inner lining of stomach from hydrochloric acid.		1
<b>A.3. Answer the following in short : (Any 5)</b>		
(1) (i) Insulin is a hormone which controls the sugar level of blood.		2
(ii) It is very important that insulin should be secreted according to the amount of sugar in the blood.		
(iii) The required quantity of insulin released and the time of release are regulated by feedback mechanisms.		
(iv) When the sugar level of blood rises, it is detected by the cells of the pancreas which respond to the situation by producing more insulin so that the sugar level comes back to normal.		
(v) On the other hand, as the sugar level of the blood falls, the		

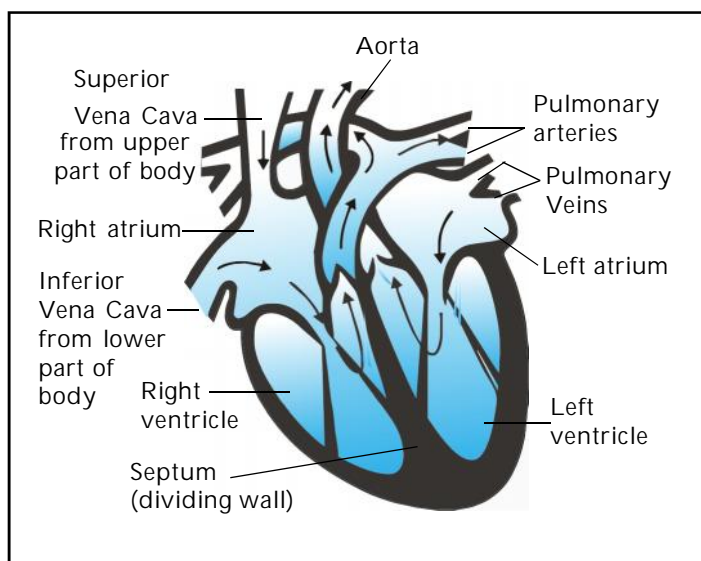
	<p>secretion of insulin is reduced.</p> <p>(vi) Therefore, insulin plays an important role in controlling the sugar level of blood.</p> <p>(2) (i) Closing of leaflets of mimosa plant when touched.          (ii) Opening of lotus in the morning and tube rose at night.          (iii) Insectivorous plants like drosera curl inwards at the touch of an insect and trap the insect.          (iv) The explosive fruit of balsam plant bursts open at an appropriate time thus scattering the seeds.</p> <p>(3) <b>Human brain :</b></p> <div data-bbox="300 763 967 1144" style="border: 1px solid black; padding: 10px; text-align: center;"> </div> <p>(4) (i) Population explosion is the root cause for the depletion of resources.          (ii) To meet the increasing demands of growing population, there is pressure on land to produce more food. Fertile lands are turning into deserts due to excessive use of fertilizers.          (iii) Forests are cut down for urbanization.          (iv) Industrialization is another reason for depletion of natural resources.</p> <p>(5)</p> <table border="1" data-bbox="292 1485 1310 1839" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;"><b>Aerobic respiration</b></th> <th style="text-align: center; padding: 5px;"><b>Anaerobic respiration</b></th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">(i) It occurs in the presence of oxygen.</td> <td style="padding: 5px;">(i) It occurs in the absence of oxygen.</td> </tr> <tr> <td style="padding: 5px;">(ii) It takes place in the cytoplasm and mitochondria.</td> <td style="padding: 5px;">(ii) It takes place in the cytoplasm.</td> </tr> <tr> <td style="padding: 5px;">(iii) The end products are carbon dioxide and water.</td> <td style="padding: 5px;">(iii) The end products are ethyl alcohol or lactic acid.</td> </tr> <tr> <td style="padding: 5px;">(iv) Large amount of energy is released (38 ATP).</td> <td style="padding: 5px;">(iv) Less amount of energy is released (2 ATP).</td> </tr> </tbody> </table>	<b>Aerobic respiration</b>	<b>Anaerobic respiration</b>	(i) It occurs in the presence of oxygen.	(i) It occurs in the absence of oxygen.	(ii) It takes place in the cytoplasm and mitochondria.	(ii) It takes place in the cytoplasm.	(iii) The end products are carbon dioxide and water.	(iii) The end products are ethyl alcohol or lactic acid.	(iv) Large amount of energy is released (38 ATP).	(iv) Less amount of energy is released (2 ATP).	<p>2</p> <p>2</p> <p>2</p> <p>2</p>
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(6)	<p>(i) The alimentary canal begins with the mouth.</p> <p>(ii) The food is processed in the mouth to generate particles with small size.</p> <p>(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.</p> <p>(iv) The food that we take is of complex nature. It is converted into 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.</p>	2
(7)	<p><b>Autotrophic nutrition:</b></p> <p>(i) Autotrophic nutrition is the mode of nutrition in which organisms synthesize their own organic food.</p> <p>(ii) They use simple inorganic substances present in the surroundings for this process.</p> <p>(iii) Such organisms are called autotrophs. Most of the plants are autotrophs.</p>	2
<b>A.4.</b>	<b>Answer the following in brief : (Any 5)</b>	
(1)	<p><b>Lymph :</b></p> <p>(i) When blood flows in the capillaries, some amount of water, proteins and dissolved solutes are filtered out from the blood plasma into the tissue spaces. This forms the tissue fluid.</p> <p>(ii) This fluid is similar to blood plasma except that it has very less amount of proteins in it because the capillary wall is impermeable to plasma proteins.</p> <p>(iii) Some amount of this fluid enters small channels called lymph vessels and the fluid now is known as lymph.</p> <p>(iv) This light yellow fluid flows only in the direction that is from the tissues to the heart.</p>	3
(2)	<p>(i) Food manufactured in the cells of the leaves during photosynthesis is transported to each cell of the plant.</p> <p>(ii) Besides this, excess food is taken to the storage organs like roots, fruits and seeds.</p> <p>(iii) This process is called translocation and it takes place through the phloem in upward and downward directions.</p> <p>(iv) Translocation process requires energy and this energy is obtained from ATP.</p> <p>(v) When food material like sucrose is transferred to phloem tissue using ATP, the concentration of water molecules decreases in that area. This results in movement of water into cell due to osmosis.</p>	3

	<p>(vi) The contents within the cell thus, exert high amount of pressure on the cell wall; because of which the food materials move to the adjacent cells with low pressure.</p> <p>(vii) According to the plant's needs, the food material is moved in the phloem to the various parts of the plants like buds, roots, stem, etc.</p>	
(3)	<p>(i) The food is pushed into the stomach by peristaltic movement of the food pipe.</p> <p>(ii) As the food enters the stomach, the gastric glands present in the stomach secrete hydrochloric acid, enzyme pepsin and mucus.</p> <p>(iii) The hydrochloric acid creates the acidic pH necessary for action of pepsin.</p> <p>(iv) Pepsin breaks down proteins.</p> <p>(v) Mucus secreted protects the inner lining of the stomach from the action of acids.</p> <p>(vi) The muscular walls of the stomach churn the food and help in mixing of gastric juices.</p> <p>(vii) The muscular sphincter present at the exit of the stomach releases small amounts of partly digested food into the small intestine.</p>	<b>3</b>
(4)	<p>(i) Plants do not have definite excretory system or organ for removal of wastes.</p> <p>(ii) Gaseous excretory materials are eliminated by diffusion.</p> <p>(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.</p> <p>(iv) Plants also excrete some waste substances in the soil around them.</p> <p>(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.</p> <p>(vi) Some plant wastes are very useful to human beings. e.g. rubber latex, gum, resins and essential oils like eucalyptus or sandalwood oil.</p>	<b>3</b>
(5)	<p>(i) The central nervous system is a delicate structure composed of the brain and the spinal cord.</p> <p>(ii) The brain is situated in the cranium and the spinal cord is placed in the vertebral column.</p> <p>(iii) The cranium or the bony skull protects the brain and the vertebral column protects the spinal cord.</p> <p>(iv) Protective membranes called the meninges are present in the</p>	<b>3</b>

	<p>space between the soft CNS and bone.</p> <p>(v) There are cavities present in different parts of the brain known as ventricles, while the long cavity of the spinal cord is called the central canal.</p> <p>(vi) The ventricles, central canal and the space between the meninges are filled with cerebrospinal fluid [CSF]. CSF keeps the CNS well nourished and protects it by absorbing mechanical shocks.</p> <p>(6) <b>Reflex action:</b></p> <p>(i) Any sudden change in response to some happening in the environment, is called as reflex action.</p> <p>(ii) We react to such a situation without thinking about it or without feeling in control of our reactions.</p> <p>(iii) Example : When we touch a vessel containing very hot tea, immediately the hand is withdrawn.</p> <p>(iv) In this case, the nerves that detect pain are connected to the nerves that bring about the action of the muscle, hence the action is completed quickly.</p> <p>(v) Nerves from all over the body meeting in a bundle in such a connection is called as the spinal cord.</p> <p>(vi) Hence reflex arcs are formed in the spinal cord, although the messages reach the brain.</p> <p>(7) Salient features of The Biomedical Waste Rules:</p> <p>(i) These rules deal with the generation, handling, treatment and disposal of biomedical waste.</p> <p>(ii) These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose or handle biomedical waste in any form.</p> <p>(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.</p> <p><b>A.5. Answer in detail: (Any 1)</b></p> <p>(1) (i) The human heart is a muscular organ which pumps blood.</p> <p>(ii) The heart is covered by the pericardial membrane.</p> <p>(iii) It is of the size of a human fist and weighs about 360 gm.</p> <p>(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.</p> <p>(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.</p>	<p>3</p> <p>3</p> <p>5</p>
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- (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.



- (2)
- (a) Anaerobic reaction **CO<sub>2</sub> + Ethanol + 2 ATP.**
  - (b) Reaction in human muscles **Lactic acid.**
  - (c) Aerobic respiration **CO<sub>2</sub> + H<sub>2</sub>O.**
  - (d) Reaction in plant cell **Starch.**
  - (e) Reaction in Liver **Glycogen.**

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