

MT

2017 ___ ___ 1100

MT - SCIENCE & TECHNOLOGY - II (72) - SEMI PRELIM - II : PAPER - 3

Time : 2 Hours

Model Answer Paper

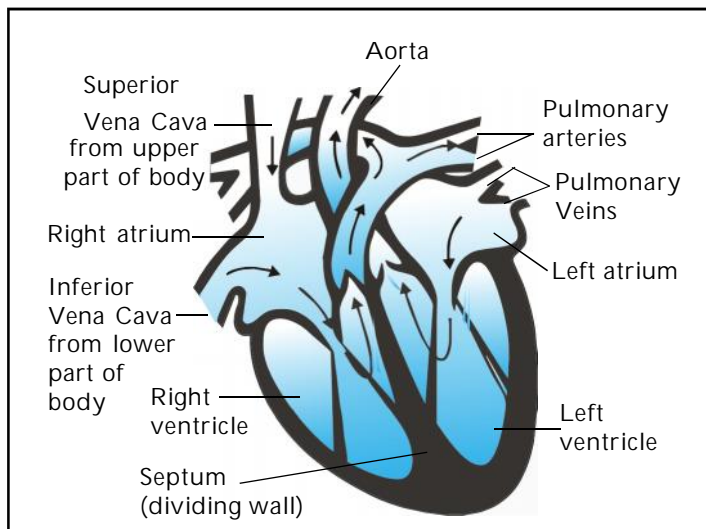
Max. Marks : 40

A.1. (A) Fill in the blanks:	
(1) The digested food is absorbed by the villi in the small intestine.	1
(2) The gap between the neurons is known as synapse .	1
(3) When sugarcane stalks are crushed to extract juice, the biomass left behind is called bagasse .	1
A.1. (B) State whether the following statements are true or false and if false, write the correct statement:	
(1) False - Aquatic animals breathe at a faster rate than the terrestrial animals.	1
(2) True	1
A.2. Rewrite the following statements by selecting the correct alternative:	
(1) When a student observed a stomatal epidermal peel of a leaf under microscope, it appeared pinkish red in colour. The stain used was safranin .	1
(2) (d) covered with transparent paper strip.	1
(3) The movement of the root system towards the stimulus of water is called hydrotropic movement.	1
(4) Ethanol is mixed with petrol or diesel as an alternative source of energy.	1
(5) The enzyme salivary amylase breaks down starch into the simple sugar maltose .	1
A.3. Answer the following in short : (Any 5)	
(1) (i) Mammals have high energy requirement for maintaining their body temperature.	2
(ii) For obtaining this energy, oxygen rich blood has to reach the cells.	
(iii) This is possible only if oxygenated and deoxygenated blood	

remain separate.
 (iv) Therefore, it is necessary to separate oxygenated blood from the deoxygenated blood.

(2) **Vertical section of human heart :**

2



- (3) (i) When there is a deep cut or injury, blood vessels are damaged and blood starts flowing out.
 (ii) Excessive loss of blood would decrease the blood pressure and reduce the efficiency of the pumping system.
 (iii) The blood platelets, on coming in contact with air, form a fibrin network and cause the blood to clot at the point of injury.
 (iv) Thus, platelets carry out the task of plugging these leaks and preventing blood loss.

2

(4) Voluntary movements and Involuntary movements

2

Voluntary movements	Involuntary movements
(i) Movements which are under our control are called voluntary movements.	(i) Movements which are not under our control are called involuntary movements.
(ii) Voluntary movements require thinking.	(ii) Involuntary movements do not require thinking.
(iii) Voluntary movements are controlled by cerebrum.	(iii) Involuntary movements are controlled by midbrain and hindbrain.
(iv) e.g Moving a table, kicking a ball, walking, clapping hands etc.	(iv) e.g. Blood flow, breathing, sneezing etc.

(5)	<p>(i) Smells enter the back of the nose when you inhale. They also rise up from the back of the mouth as we eat, which is why smell is such an important part of tasting and enjoying food.</p> <p>(ii) This is the reason why food tastes odd when we have a cold as the nasal organs become inflamed and the sense of smell is temporarily smothered.</p>	2
(6)	<p>(i) When light falls on a part of the growing plant through the window, a hormone called auxin is synthesized at the tip of the shoot.</p> <p>(ii) This auxin helps cells at the tip to grow longer.</p> <p>(iii) As the light falls on one side of the plant the auxin diffuses towards the shady side of the shoot and stimulates the cells to grow longer. Hence the plant near a window appears to bend towards light.</p>	2
(7)	<p>The fundamental duties of citizen are given in the Article 51A(g) and 51A(f) of the Constitution:</p> <p>(i) Article 51A(g) states that, "It should be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to having compassion for living creatures".</p> <p>(ii) Similarly, the Article 51A(f) states that, "it should be the duty or every citizen to value and preserve the rich heritage of our composite culture."</p>	2
A.4. Answer the following in brief : (Any 5)		
(1)	<p>(i) The World Business Council for Sustainable Development (WBCSD) is a global association of about 200 international companies.</p> <p>(ii) The term eco-efficiency was coined by WBCSD.</p> <p>(iii) It works on variety of issues related to sustainable development.</p> <p>(iv) The Council provides platform for companies to explore sustainable development, share knowledge, experiences and best practices and to advocate business positions on these issues in a variety of forums, working with governments, non-governmental organizations.</p> <p>(v) It focuses on areas such as energy and climate, development, ecosystems and role of business in society.</p> <p>(vi) It also looks after specific projects on cement, urban infrastructure initiative, corporate reporting, water, energy efficiency in buildings, forest solutions, and electricity utilities.</p>	3

<p>(2)</p> <p>(3)</p> <p>(4)</p> <p>(5)</p>	<p>Objectives of sustainable development:</p> <p>(i) Reduce pollution by using eco-friendly technology.</p> <p>(ii) Restrain the use of natural resources to ensure availability for the future generations.</p> <p>(iii) Protection of environment.</p> <p>(iv) Social equality in accessing resources.</p> <p>(v) Continuous economic growth.</p> <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 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>The movement of plants in response to the stimulus of touch is called seismonastic movement. Examples of seismonastic movement are :</p> <p>(i) closing of the leaflets of mimosa plant on touching the leaves.</p> <p>(ii) inward curling of the tentacles present on the drosera when an insect sits on it, so as to trap the insect.</p> <p>Blood pressure :</p> <p>(i) The force exerted by the blood on the wall of a blood vessel is called blood pressure.</p> <p>(ii) This pressure is greater in the arteries than the veins.</p> <p>(iii) The pressure in the artery during ventricular contraction is called the systolic pressure and the pressure in the artery during ventricular relaxation is called diastolic pressure.</p> <p>(iv) The normal systolic pressure is 120 mm of Hg and the diastolic pressure is 80 mm of Hg.</p> <p>(v) Blood pressure is measured by an instrument called as sphygmomanometer. High blood pressure is called as hypertension.</p>	<p>3</p> <p>3</p> <p>3</p> <p>3</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>	3
(7)	<p>(i) The maintenance of the steady state by different systems of an organism for its optimal functioning because of a perfect co-ordination is called homoeostasis.</p> <p>(ii) Control and co-ordination provide stability and maintenance of the steady state i.e. creation of a relatively constant environmental condition within any organism.</p> <p>(iii) In an individual's body perfect co-ordination between internal activities of the body is caused due to water or enzyme level and temperature etc. and such similar external environmental stimuli must be there to achieve homoeostasis (e.g. In summer, with excessive sweating we feel more thirsty.)</p> <p>(iv) In animals, nervous system along with hormones bring about co-ordination.</p> <p>(v) In plants, due to lack of nervous system only hormones bring about chemical co-ordination.</p>	3
A.5.	Answer in detail: (Any 1)	
(1)	<div data-bbox="478 1355 1101 1825" data-label="Diagram"> <p>The diagram illustrates the structure of a nephron, the basic filtration unit in the kidney. It shows a cluster of thin-walled blood capillaries called a glomerulus, which is enclosed in a Bowman's capsule. Unfiltered blood enters the glomerulus from the left. Filtered blood exits the glomerulus to the right. The filtrate then moves into a long U-shaped tubule, which eventually leads to a collecting duct where urine is collected.</p> </div> <p>(i) The basic filtration unit in the kidney is a cluster of thin walled blood capillaries called as a Nephron. Each kidney has</p>	5

	<p>approximately a million nephrons. Each nephron has a cup shaped thin walled upper end called Bowman's capsule which contains a bundle of blood capillaries called glomerulus.</p> <p>(ii) Urea formed in the liver enters the blood. When blood containing urea enters the glomerulus, it gets filtered through glomerular capillaries.</p> <p>(iii) The selectively permeable wall of the Bowman's capsule allows the water molecules and small molecules of other substances to pass through them and forms glomerular filtrate.</p> <p>(iv) The glomerular filtrate collected in the Bowman's capsule further passes through the nephron tubule where reabsorption of water and useful molecules takes place.</p> <p>(v) The remaining fluid containing the waste, forms the urine which eventually enters a long tube called the ureter. It is further stored in the urinary bladder and from there it is thrown out through the urethra.</p> <p>(vi) As the bladder is muscular, it is under the control of nerves. As a result, we can usually control the urge to urinate.</p> <p>(2) Basic steps of nutrition in animals :</p> <ol style="list-style-type: none">1. Ingestion : The act of taking food inside.2. Digestion : The process of breaking down of complex organic food into simpler soluble substances. This is done mechanically by teeth and chemically with the help of enzymes.3. Absorption : After digestion is completed soluble digested food is absorbed into the blood.4. Assimilation : The absorbed food is transported into tissues and cells of the body where they are used to produce energy or for growth and development or stored for future use.5. Egestion : The undigested and unabsorbed residues of food are thrown out of the body.	5
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