

Practice Questions - Term I

Date: 10/11/2021

Subject: Biology

Topic : Life Processes

Class: X

1. The opening and closing of stomata depend on the following:

- A. Concentration of oxygen in the atmosphere.
- B. Temperature of the atmosphere.
- C. Presence of water in guard cells.
- D. Concentration of carbon dioxide in the atmosphere.

The opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them, causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink when water flows out from the guard cells.

2. The instrument used for measuring blood pressure is:

- A. Manometer
- B. Sphygmomanometer
- C. Thermometer
- D. Barometer

A sphygmomanometer is an instrument used for measuring blood pressure. It consists of an inflatable rubber cuff that is applied to the arm and connected to a column of mercury next to a graduated scale. It measures the systolic and diastolic blood pressure by increasing and gradually releasing the pressure in the cuff.

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3. Exchange of gases in the human body occurs in the:

- A. Alveoli
- B. Bronchi
- C. Trachea
- D. Larynx

Alveoli is one of the sites at which the exchange of oxygen and carbon dioxide occurs. Alveoli contain higher concentrations of oxygen as compared to the blood and blood contains higher concentrations of carbon dioxide. Due to this concentration gradient, the exchange of these two gases takes place through diffusion. Gas exchange also occurs between the blood and the cells.

4. The phloem tissue in plants is responsible for the transport of:

- A. Water
- B. Minerals
- C. Food
- D. All of the above

Xylem and phloem are the two vascular tissues that are responsible for the transport of substances in plants. Phloem helps the bidirectional transport of food whereas xylem helps in the unidirectional transport of water.

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5. Which among the following is not a part of the alimentary canal?

- A. Stomach
- B. Liver
- C. Oesophagus
- D. Rectum

The alimentary canal is a long tube that carries the food we eat. It begins at the mouth (buccal or oral cavity), passes through the pharynx, oesophagus or food pipe, stomach, small intestine, large intestine, rectum and finally ends at the anus. The liver is an accessory gland that helps in the digestion of food by producing bile, which helps in the digestion of fat in the small intestine but the food does not pass through it, therefore the liver is not a part of the alimentary canal. The stomach, oesophagus and rectum are the parts of the alimentary canal.

6. Which of these is the correct path of urine in our body?

- A. Kidney → Ureter → Urethra → Urinary bladder
- B. Kidney → Urinary bladder → Urethra → Ureter
- C. Kidney → Ureter → Urinary bladder → Urethra
- D. Urinary bladder → Kidney → Ureter → Urethra

The kidney filters waste from the blood and produces urine in the human body. From the kidney through two tubes called ureters the urine descends into the urinary bladder. From the urinary bladder, urine is excreted through the urethra. Therefore, the correct path taken by urine in our body is the Kidney → Ureter → Urinary bladder → Urethra.

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7. Why is it necessary for the food to be broken down and digested?

- A. Large molecules in intact food pass through the digestive epithelium and enter the cell through the membrane, damaging the nuclear membrane. Hence, it must be broken down.
- B. Fats present in intact food contain very large molecules that cannot pass through cell membranes. Fats need to be passed through the digestive epithelium to be utilised.
- C. Large molecules present in intact food cannot pass through cell membranes. Nutrients need to be separated from food to be passed through the digestive epithelium to be utilised.
- D. If not broken down, large molecules produce toxic substances that pass through the epithelium of the digestive tract and are utilised by the cells. This can be lethal to the cells.

Food that we consume contains complex organic molecules like carbohydrates, proteins and fats that cannot pass through the cell membranes of the small intestine where absorption takes place. In order to be absorbed by the body, these large and complex molecules have to be broken down into simple nutrients like glucose, amino acids, fatty acids and glycerols respectively.

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8. There is an increase in blood urea when there is insufficient filtration in _____.

- A. loop of Henle
- B. distal tubule
- C. Bowman's capsule
- D. collecting tubule

The process of filtration occurs in the glomerular capsule also known as Bowman's capsule.

The Bowman's capsule contains a dense capillary network called the glomerulus. Blood flows into these capillaries. The blood that enters into the glomerulus contains urea, glucose, various salts and proteins of plasma and large quantities of water.

The filtration occurs across the membrane made up of the glomerular capillary wall and the inner membrane of the Bowman's capsule. The pores of this filtering membrane are impermeable to large molecules like blood cells and proteins.

But smaller molecules like glucose, urea, creatinine, amino acids, and mineral salts are filtered into the Bowman's capsule. The insufficient filtration in Bowman's capsule results in an increased concentration of urea in the blood.

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9. Aerobic respiration produces more usable chemical energy than fermentation because fermentation involves:

- A. Formation of lactic acid
- B. Complete oxidation of food
- C. Partial oxidation of food
- D. Evolution of CO₂ and alcohol

Aerobic respiration produces more usable chemical energy in the form of ATPs than fermentation because aerobic respiration involves the complete oxidation of glucose and the release of carbon dioxide and water as end products. On the other hand fermentation, a type of anaerobic respiration seen in organisms like yeast, involves the partial oxidation of glucose and release of ethanol and carbon dioxide as the end products. Due to the complete oxidation of glucose, ATP formed during aerobic respiration is much more than anaerobic respiration.

10. Select the correct events that occur during inspiration.

- A. Diaphragm contracts
- B. Diaphragm relaxes
- C. Thoracic cavity volume decreases
- D. Ribs and sternum return to the original position

When we inhale: the internal intercostal muscles relax and the external intercostal muscles contract, pulling the ribcage upwards and outwards and the diaphragm contracts, pulling downwards. As a result lung volume increases and the air pressure inside decreases, this leads to movement of the air from outside to inside the body.

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11. **Assertion:** Intensive exercise leads to muscle cramps.

Reason: Ethanol is produced as a result of anaerobic respiration.

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

Anaerobic respiration occurs during high-intensity exercises. When our body works so hard there is a shortage of oxygen for energy consumption. Due to the shortage of oxygen, our body breaks down glucose stored in our muscles for energy. As a byproduct of the breakdown, lactic acid is formed. The buildup of lactic acid can cause muscle pain, cramps and muscle fatigue.

Ethanol is a product of anaerobic respiration in yeasts and this process is known as fermentation.

12. **Assertion:** CO_2 diffuses only from tissue to alveoli and not in the reverse direction.

Reason: CO_2 is 10 times more soluble than O_2 .

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

Concentration of CO_2 is more in the tissues than in the alveoli, thereby diffusion of CO_2 takes place from tissue to blood and from blood to alveoli and not in the reverse direction. The solubility of CO_2 is 20 times more than that of O_2 but the reason for the diffusion of CO_2 from tissue to alveoli is concentration gradient not the solubility of the gases.

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13. **Assertion:** Fermentation occurs by the incomplete oxidation of glucose.

Reason: Yeast forms ethanol & CO₂ from pyruvic acid.

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

Fermentation, a type of anaerobic respiration seen in organisms like yeast, involves the partial oxidation of glucose and the release of ethanol and carbon dioxide as the end products. The reason for the incomplete oxidation of glucose is the absence of oxygen, not the products formed by the process.

14. **Assertion:** Pulmonary artery carries oxygenated blood from the left ventricle to the lungs.

Reason: All arteries carry oxygenated blood.

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

Arteries, in general, carry oxygenated blood from the left ventricle to different body parts but the pulmonary artery is an exception. The pulmonary artery carries deoxygenated blood from the right ventricle to the lungs where the blood gets oxygenated. Hence both the statements are false.

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15. **Assertion:** Left ventricle pumps oxygenated blood to different body parts while the right ventricle pumps deoxygenated blood to the lungs.
Reason: Right atrium receives deoxygenated blood from different parts of the body while the left ventricle pumps oxygenated blood to different parts of the body.

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

The heart's four chambers are:

- a) Right atrium: This chamber receives oxygen-depleted blood returning from the body and pumps it into the right ventricle.
- b) Right ventricle: The right ventricle pumps blood from the right atrium to the pulmonary artery that sends the deoxygenated blood to the lungs, where it picks up oxygen.
- c) Left atrium: This chamber receives oxygenated blood from the lungs and pumps it to the left ventricle.
- d) Left ventricle: The thickest of all the chambers, the left ventricle is the difficult working part of the heart as it pumps blood throughout the whole body.
- Therefore A and R are true, but R is not a correct explanation for A.

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16. **Assertion:** Walls of the ventricles are generally thicker than that of the atria.

Reason: Ventricles pump blood to different organs with high pressure.

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

Ventricles have thicker walls than atria because they have to pump blood to different organs with high pressure while atria just receive blood from other parts of the body.

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17. **Case:** Neena was writing a project report on nutrition in different organisms. A study on the digestive system of different animals showed that the length of the food pipe or oesophagus in different animals are different. The study showed that herbivores have a longer small intestine as compared to carnivores. Help Neena to complete her report by answering the following question:

Which of the following organisms have the same mode of nutrition as the animals including humans?

- A. Plants
- B. Fungi
- C. Amoeba
- D. All of the above

All green plants have an autotrophic mode of nutrition. They prepare their own food by utilising solar energy, water, and carbon dioxide through the process of photosynthesis. Heterotrophic nutrition is the mode of nutrition where the organism is unable to prepare its own food and hence, depends upon plants or other organisms for nutrition. It is of three types, saprophytic, parasitic and holozoic. Fungi obtain food from dead and decaying substances and hence follow a saprophytic mode of nutrition, whereas amoeba and other animals including humans follow a holozoic mode of nutrition

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18. **Case:** Neena was writing a project report on nutrition in different organisms. A study on the digestive system of different animals showed that the length of the food pipe or oesophagus in different animals are different. The study showed that herbivores have a longer small intestine as compared to carnivores. Help Neena to complete her report by answering the following question:

Why do herbivores have a longer small intestine than carnivores?

- A. Herbivores consume more food than carnivores.
- B. Herbivores consume simple sugar that is difficult to digest.
- C. Herbivores consume grass that is rich in cellulose.
- D. Carnivores consume meat that is difficult to digest.

Herbivores eat plant and grass-based food that is rich in cellulose. Cellulose takes time to digest so these animals have a long small intestine. Carnivores consume meat that is easier to digest so these animals have a short small intestine.

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19. **Case:** Neena was writing a project report on nutrition in different organisms. A study on the digestive system of different animals showed that the length of the food pipe or oesophagus in different animals are different. The study showed that herbivores have a longer small intestine as compared to carnivores. Help Neena to complete her report by answering the following question:

State the adaptations of the small intestine that help in the absorption of food.

- A. Greater length and less width causes slow movement of food
- B. Presence of a larger number of villi
- C. Single-cell epithelium
- D. All of the above

Small intestine is the site of digestion and absorption of nutrients. It is adapted well to enable the effective absorption of nutrients from the digested food. It is adapted with greater length and less width that causes slow movement of food which gives enough time for absorption, it has larger numbers of villi which increases the surface area for absorption, and single-cell epithelium helps in easy transport of nutrients across the epithelial layer.

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20. **Case:** Neena was writing a project report on nutrition in different organisms. A study on the digestive system of different animals showed that the length of the food pipe or oesophagus in different animals are different. The study showed that herbivores have a longer small intestine as compared to carnivores. Help Neena to complete her report by answering the following question:

Name the enzyme that is released by the gastric glands of the stomach.

- A. Trypsin
- B. Pepsin
- C. Lipase
- D. Ptyalin

Pepsin is released by the gastric glands in the stomach and helps in the digestion of proteins. Trypsin and lipase are present in the pancreatic juice secreted by the pancreas. Ptyalin or salivary amylase is secreted by the salivary glands.