KALPAVRUKSHA MODEL SCHOOL

ASSIGNMENT ANSWER

Class: X **Sub: BIOLOGY**

TOPIC: LIFE PROCESSES

Assignment -2 Date:27.5.2021

I. ANSWER THE FOLLOWING QUESTIONS:

1. Why is trachea lined with the rings of cartilage?

Ans. Trachea is lined with the rings of cartilage to prevent it from collapsing.

2. Why do we feel muscle cramps after heavy exercise?

Ans. We feel muscle cramps after heavy exercise because our cells and tissues become O_2 deficient and start undergoing anaerobic respiration. This produces lactic acid and we feel muscle cramps.

3. Why is it advised to breathe through nose?

Ans: It is advised to breathe through nose because the mucus and hair present in the nasal cavity help filter the inhaled air.

4. What is a diaphragm?

Ans: It is a muscular partition between thorax and abdomen, it can become flat or dome shaped due to contraction and relaxation of muscles.

5. Why don't the lungs collapse even after forceful expiration?

Ans: Even after forceful expiration to the maximum capacity, some amount of air remains in the lungs, known as residual volume. So, the lungs don't collapse even after forceful expiration.

6. How does respiration in plants differ from that in animals?

Ans: In plants, all parts like the root, stem, leaves, etc., perform respiration individually, while in animals, either the general body surface or specific organs like the skin, gills, lungs, etc., are involved in respiration. The rate of respiration is much slower in plants than in animals. Unlike animals, there is little transport of gases from one part of the plant to another.

7. "All plants give out oxygen during day and carbon dioxide during night." Justify the statement.

Ans: During day time rate of photosynthesis is more than the rate of respiration. So net result is evolution of oxygen. At night there is little photosynthesi compared to respiration so result is evolution of carbon dioxide.

8. Name and define the five steps of holozoic nutrition.

Ans: The five steps of holozoic nutrition

a. Ingestion:-- the process of intake of food
b. Digestion:-- changing complex food substances to simple form by the action of enzymes
c. Absorption:-- digested food is absorbed in blood
d. Assilmilation:-- the absorbed food components are converted into components of cytoplasm
e. Egestion :-Throwing out of waste

9. Distinguish between:

a) Aerobic and anaerobic respiration

	Aerobic respiration	**Anaerobic respiration**
1	It requires oxygen	It doesn't require oxygen
2	Releases 38 ATP molecules	Releases only 2 ATP molecules
3	Food is completely broken down	Food is incompletely broken down

b) Inhalation and exhalation

	Inhalation	**Exhalation**
1	Taking in fresh air	Giving out foul air
2	Diaphragm becomes flat	Diaphragm becomes dome shaped
3	Air pressure decreases in the lungs	Air pressure increases in the lungs

Assignment -3 Date:3.6.2021

1. Why do aquatic organisms show a higher breathing rate?

Ans: The aquatic organisms obtain oxygen dissolved in water. As compared to air, the availability of oxygen in water is fairly low. Hence, the aquatic organisms have to breathe faster as compared to the terrestrial organisms.

2. Which of the organs perform the following functions in humans?

Ans: a. Absorption of food- small intestine
b. Absorption of water- Large intestine

3. List out the functions of blood.

Ans: Functions of blood are:

a) Transport nutrients, gases (CO2 & O2), waste products, hormones etc
b) Maintenance of water balance
c) Regulate body temperature
d) Body defence
e) Plugging areas of injury

4. Bile juice does not contain any digestive enzymes, yet it is essential for digestion, why so? Explain.

Ans: Bile juice does not contain any digestive enzymes, yet it is essential for digestion because

a. it breaks fat into fine globules (emulsification).

b. Neutralisation of acidity and making food alkaline for action of pancreatic and other enzymes.

5. Due to availability of less water, how does the plant cope with lack of water in desert conditions?

Ans: Due to availability of less water in desert, they open their stomata at night and stomata remain closed during day time, to conserve moisture.

6. Name the cartilaginous flap which closes the glottis to check the entry of food into it during swallowing.

Ans: Epiglottis is the cartilaginous flap which closes the glottis to check the entry of food into it during swallowing.

7. Veins and arteries carry blood. Which of these carry blood?

a) Away from the heart?

b) Back to the heart?

Ans: a) Arteries carry blood away from the heart.

b) Veins carry blood back to the heart.

8. What is the function of digestive enzymes?

Ans: Digestive enzymes are hydrolylic enzymes which bring about hydrolylic splitting of complex organic substances into simple, soluble and absorbable substances.

Eg: Protein ⟶ Peptones ⟶ Peptides ⟶ Amino acids.

9. Write any two functions of stomata.

Ans: Functions: a) Exchange of gases

b) Loss of extra water by transpiration.

10. How do guard cells regulate opening and closing of stomatal pores?

Ans: The swelling of guard cells due to absorption of water causes opening of stomatal pores while shrinking of guard cells closes the pores. Closing and opening of stomata occur due to turgor changes in guard cells. When guard cells are turgid, stomatal pore is open while in flaccid conditions the stomatal pore closes.

Assignment -4 Date:10.6.2021

1. What do you mean by double circulation of blood? Why is it necessary?

Ans-Blood passes through the heart twice for each cycle of the body. This is called double circulation. Double circulation of blood is necessary because:

a) It ensures supply of oxygenated blood to all the parts for efficient release of energy to ensure higher physical activity and thermoregulation of body.

b) It also provides for direct passage of all deoxygenated blood to lungs for oxygenation.

2. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Ans: It is necessary in mammals and birds to separate oxygenated and de-oxygenated blood because this makes their circulatory system is more efficient and helps in maintaining constant body temperature

3. What are the components of the transport system in human beings? What are the functions of these components?

Ans: The main components of the transport system in human beings are the heart, blood, and blood vessels.

- The heart pumps oxygenated blood throughout the body. It receives deoxygenated blood from the various body parts and sends this impure blood to the lungs for oxygenation.
- Blood helps in transport nutrients, gases (CO2 & O2), waste products, hormones etc, maintenance of water balance, regulate body temperature, body defence, plugging areas of injury
- Blood vessels allow both the distribution of nutrients and the recovery of metabolic waste.

4. How are alveoli designed to minimise the exchange of gases?

Ans: The human lungs have been designed to maximise the exchange of gases, there are millions of alveoli in the lungs. The presence of millions of alveoli in the lungs provide a very large area for the exchange of gases. The availability of large surface area maximises the exchange of gases.

5. What would be the consequences of deficiency of haemoglobin in our body?

Ans: Deficiency of haemoglobin in the blood can affect the oxygen supplying capacity of the blood. This can lead to a deficiency of oxygen in the body cells. It can also lead to a disease called anaemia.

6. How is oxygen and carbon dioxide transported in human beings?

Ans: Respiration is the process through which living organisms take in oxygen and give out carbon dioxide to release energy. So, naturally, respiration is a major and vital process of gas exchange. The transport of gases during respiration, both oxygen and carbon dioxide are carried out by the blood cells.

The transportation of gases is a very efficient process.

Transport of Oxygen

- During respiration, about 97% of oxygen is transported by red blood cells in the blood and the remaining 3% gets dissolved in the plasma.
- Haemoglobin transports oxygen molecule to all the body cells for cellular respiration.
- The haemoglobin pigment present in the blood gets attached to O_2 molecules that are obtained from breathing and thus forms oxyhaemoglobin.
- This oxygenated blood is then distributed to all the body cells by the heart.
- After giving away O_2 to the body cells, blood takes away CO_2 which is the end product of cellular respiration and blood becomes de-oxygenated.

Transport of carbon dioxide

- Since haemoglobin pigment has less affinity for CO_2, it is mainly transported in the dissolved form.
- This deoxygenated blood gives CO_2 to lung alveoli and takes O_2 in return.
- Around 20-25% of carbon dioxide is carried by haemoglobin as carbamino-haemoglobin.
- 7% is in a dissolved state in the plasma and the remaining is carried as bicarbonate. Again, the binding of carbon dioxide with haemoglobin is related to the partial pressure of carbon dioxide, and the partial pressure of oxygen.
- As mentioned earlier, the partial pressure of carbon dioxide is high in the tissues and this is where more binding of carbon dioxide occurs.
- In the alveoli where the partial pressure of oxygen is high, carbon dioxide gets dissociated from carbamino-haemoglobin.
- The enzyme carbonic anhydrase present in a high concentration in RBCs, and in small quantities in the plasma, facilitates this reaction in both the directions.
- So, the bicarbonate formed at the tissues releases carbon dioxide at the alveoli.

7. Name the components of blood. Why are WBC called "Soldiers of the body"?

Ans: The constituents of blood are RBCs, WBCs, platelets and plasma. WBCs are so called as they fight against foreign bodies in the blood and protect the body and thus, they are agents of defence mechanism of our body.

8. How does blood circulate between lungs and heart in human beings?

Ans: • "Deoxygenated or impure blood" from various parts of body collects in the right heart chambers – the "right auricle" and right ventricle.

• This 'deoxygenated blood' from the right heart chambers reaches the lungs through "pulmonary vein".

• There this blood "absorbs oxygen" and "releases carbon dioxide" and gets oxygenated or pure.

• Pure oxygenated blood from lungs then enters through the left chambers of the heart – left auricle and left ventricle through the 'pulmonary vein'.

• Pure oxygenated blood is then pumped to different parts of body from these left heart chambers.

9. State two structural differences between an artery and vein.

Ans: Structural differnces bewteen arteries and veins are

1. Arteries have a much thicker wall to withstand the high pressure of blood flowing in them, whereas **veins** have a thinner wall so that they can be pressed flat against adjacent muscles, helping to move the blood.

2. Veins have valves, contrary to arteries, to prevent back-flow of blood flowing in them.

3. Arteries have a narrow lumen to maintain the high blood pressures, while **veins** have a wide lumen to accommodate the slow-flowing blood.

10. Draw neat labelled diagrams of sectional view of the human heart and schematic representation of transport and exchange of oxygen and

carbondioxide.

Ans: Page no: 106, Figure 6.10 and 6.11

Assignment -5 Date:17.6.2021

1. (a) Compare the length of small intestine in herbivore and carnivore animal. (2013)
(b) Mention any two structural modifications in small intestine which helps in absorption.

Ans: (a) The length of the small intestine differs in various animals depending on the type of food they eat. For example, cellulose is a carbohydrate food which is digested with difficulty. So, the herbivorous animals like cow which eat grass need a longer 'small intestine' to allow the cellulose present in grass to be digested completely. On the other hand, meat is a food which is easier to digest. So, the carnivorous animals like tigers which eat meat, have a shorter 'small intestine'.

(b) The inner surface of small intestine has millions of tiny, finger-like projections called villi. The presence of villi gives the inner walls of the small intestine a very large surface area and the large surface area of small intestine helps in the rapid absorption of digested food.

2. Assume that you are a veterinary surgeon and you had removed a good length of the small intestine of a bear that was suffering from an intestinal tumor. Now, would you suggest a plant based or a meat based diet for the bear after its recovery? Give reason for your answer.

Ans: I would suggest a meat based diet for the bear after its recovery because meat based food can be digested easily in a smaller sized small intestine.

3. (a) What is translocation? Why is it essential for plants?
(b) Where are the substances translocated by the phloem delivered?

Ans: (a) The movement of food from leaves to other parts of the plant in phloem is called translocation. The translocation is necessary because every part of the plant needs food for obtaining energy, for building its parts and maintaining its life.

(b) The movement of food in phloem is transported upwards or downwards depending on the needs of the plant, for example, in spring, even the sugar stored in the root or stem tissue of a plant would be transported through phloem to the buds which need energy to grow.

4. Explain how water and minerals are transported in plants?

Ans: Most plants secure their water and minerals from their roots. Minerals travel dissolved in water. Water and minerals are transported through xylem cells from the soil to the leaves. The xylem cells of roots, stem and leaves are interconnected to form a conducting channel. The root cells take ions from the soil.
This creates a difference between the concentration of ions of roots and soil. Therefore, there is a steady movement of water into xylem. An osmotic pressure is formed and water and minerals are transported form one cell to the other due to osmosis. The continuous loss of water takes place due to transpiration.