
	<b>INDIAN SCHOOL AL WADI AL KABIR</b>	
<b>CLASS: X</b>	<b>DEPARTMENT OF SCIENCE – 2023-24</b> <b>SUBJECT: BIOLOGY</b>	<b>DATE OF COMPLETION</b> <b>MAY 15, 2023</b>
<b>WORKSHEET NO: 1 WITH ANSWERS</b>	<b>TOPIC: LIFE PROCESSES</b> <b>(Nutrition and Respiration)</b>	<b>A4 FILE FORMAT</b> <b>(PORTFOLIO)</b>
<b>CLASS &amp; SEC:</b>	<b>NAME OF THE STUDENT:</b>	<b>ROLL NO.</b>

**I MULTIPLE CHOICE QUESTIONS EACH QUESTION CARRY 1 MARK**

**1a. Multiple Choice Questions.**

- A gland not associated with the alimentary canal.  
(a) Liver      (b) salivary gland      (c) Pancreas      (d) Adrenal gland
- The mode of nutrition in which an organism derives its nutrition from other living organisms without killing it.  
(a) Saprophytic nutrition      (b) Parasitic nutrition  
(c) Autotrophic nutrition      (d) Holozoic nutrition.
- Large intestine in humans mainly carries out –  
(a) Absorption      (b) Assimilation      (c) digestion of fats      (d) digestion of carbohydrates
- Bile juice is secreted by  
(a) Stomach      (b) Pancreas      (c) Small intestine      (d) Liver
- Respiratory pigment in human body is  
(a) Chlorophyll      (b) Water      (c) Blood      (d) haemoglobin

**1b. ASSERTION & REASONING –**

**Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:**

- (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 the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

6. **Assertion (A):** In anaerobic respiration, one of the end products is alcohol.

**Reason (R) :** There is an incomplete breakdown of glucose.

7. **Assertion (A):** Bile is essential for the digestion of lipids.

**Reason (R) :** Bile juice contains enzymes.

8. **Assertion (A):** Rings of cartilage are present in the throat,

**Reason (R) :** These ensure that the air passage does not collapse

9. **Assertion:** The accumulation of lactic acid in the muscles causes muscle cramps.

**Reason:** During vigorous physical exercise leg muscles respire anaerobically.

10. **Assertion:** Pancreatic juice digests starch, proteins and fats.

**Reason:** Pancreatic juice contains digestive enzymes like pancreatic amylase, trypsin and lipase.

### **11. 1c. Case-based/Source based questions.**

At the bottom of the pharynx, this pathway divides in two, one for food — the oesophagus, which leads to the stomach — and the other for air. The epiglottis, a small flap of tissue, covers the air-only passage when we swallow, keeping food and liquid from going into the lungs. The larynx, or voice box, is the top part of the air-only pipe. This short tube contains a pair of vocal cords, which vibrate to make sounds. The trachea, or windpipe, is the continuation of the airway below the larynx. The walls of the trachea are strengthened by stiff rings of cartilage to keep it open. The trachea is also lined with cilia, which sweep fluids and foreign particles out of the airway so that they stay out of the lungs. At its bottom end, the trachea divides into left and right air tubes called bronchi, which connect to the lungs. Within the lungs, the bronchi branch into smaller bronchi and even smaller tubes called bronchioles. Bronchioles end in tiny air sacs called alveoli, where the exchange of oxygen and carbon dioxide actually takes place. Each person has hundreds of millions of alveoli in their lungs. This network of alveoli, bronchioles, and bronchi is known as the bronchial tree. The lungs also contain elastic tissues that allow them to inflate and deflate without losing shape and are covered by a thin lining called the pleura.

1. What is the function of epiglottis?
2. How is sound produced?
3. What does the brachial tree comprise of?
4. What is the function of cilia lined in the trachea?

## **II. SHORT ANSWER TYPE QUESTIONS CARRYING 2 MARKS EACH**

12. What is common for cuscuta, ticks and leeches?
13. Name the substrates for the following enzymes –  
(i) Trypsin (ii) Amylase (iii) Pepsin (iv) Lipase.
14. What are the two stages of photosynthesis?
15. What type of respiration takes place in human muscles during vigorous exercise and why?
16. What is the role of the diaphragm during inhalation and exhalation?

## **III. SHORT ANSWER TYPE QUESTIONS CARRYING 3 MARKS EACH**

17. How are fats digested in our bodies? Where does this process take place?
18. How respiration does takes place in plants?
19. How is haemoglobin associated with respiration explained?
20. Give an experiment to prove the essentiality of light for photosynthesis
21. What is the role of following in human digestive system –
  - a) mucous
  - b) Bicarbonate
  - c) Trypsin

## **IV. LONG ANSWER TYPE QUESTIONS CARRYING 5 MARKS EACH**

22. What are the different ways in which glucose is oxidised to provide energy in various organisms?
23. (i) Name the process and explain the type of nutrition found in green plants. List the raw materials required for this process. Give a chemical equation for the mentioned process.  
  
(ii) Write three events that occur during this process.
24. (a) Write the reaction that occurs when glucose breaks down anaerobically in yeast.  
  
(b) Write the mechanism by which fishes' breath in water.  
  
(c) Name the balloon likes structures present in lungs. List its two functions.  
  
(d) Name the respiratory pigment and write its role in human beings.
25. (a) Draw a diagram of human alimentary canal and label the following parts:

- (i) Largest gland.
  - (ii) Gland that secretes digestive enzymes and hormones.
  - (iii) Part where HCl is produced.
  - (iv) Part where digested food is absorbed.
- (b) What are villi? Explain their function in the digestive system.

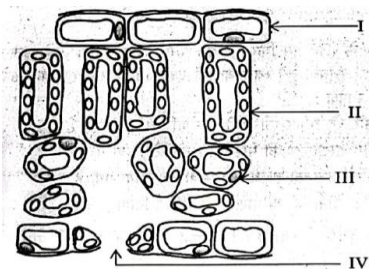
26. (a) Compare the length of the small intestine in herbivore and carnivore animals.  
 (b) Mention any two structural modifications in the small intestine which help in absorption.

**V. BOARD BASED QUESTIONS (2022-2023)**

27. Sphincter muscles are present at the exit of

- (a) Stomach and small intestine.
- (b) Stomach and anus.
- (c) Small intestine and large intestine.
- (d) Oesophagus and stomach.

28. In the following diagram, identify the cells through which massive amounts of gaseous exchange take place for photosynthesis:



- (a) I
- (b) IV
- (c) III
- (d) II

29. During vigorous exercise, the occurrence of cramps in the outer muscles of an athlete is due to the conversion of pyruvate to :

- (a) Glucose
- (b) Ethanol
- (c) Lactic acid
- (d) Lactose

30. (a) (i) What is the first step in the breakdown of glucose during aerobic and anaerobic respiration? Where does it take place?

(ii) ATP is called the energy currency of the cell why?

(iii) What is meant by “Residual volume of air” in breathing cycle?

(b) Write in sequence the steps of experimental verification of the fact that “sunlight is essential for photosynthesis”

<b>ANSWER KEY TO WORKSHEET TOPIC: LIFE PROCESSES (Nutrition and Respiration)</b>	
1a.	<b><u>Multiple choice questions.</u></b>
1.	(d) Adrenal gland
2.	(b) Parasitic nutrition
3.	(a) Absorption
4.	(d) Liver
5.	(d) haemoglobin
<b><u>1b. ASSERTION &amp; REASONING –</u></b>	
6.	Option A is correct, assertion is true and it is given with correct explanation, because anaerobic respiration is the breakdown of glucose without oxygen. So, in anaerobic respiration glucose is partially oxidized and result in formation of alcohol as by product.
7.	(c) A is true but R is false.
8.	(a) Both A and R are true and R is the correct explanation of A.
9.	(a) Both A and R are true and R is the correct explanation of A.
10.	(a) Both A and R are true and R is the correct explanation of A.
II.	<b><u>1c. Case based/Source based questions.</u></b>
11.	1. Covers the air-only passage when we swallow, keeping food and liquid from going into the lungs. 2. a pair of vocal cords, which vibrate to make sounds 3. Network of alveoli, bronchioles, and bronchi is known as the bronchial tree. 4. sweep fluids and foreign particles out of the airway
II.	<b><u>SHORT ANSWER TYPE QUESTIONS CARRYING 2 MARK EACH</u></b>
12.	<b>Ans.</b> Cuscuta, ticks and leeches, all has parasitic mode of nutrition, they harm their host while taking nutrition.
13.	<b>Ans.</b> a) Protein, b) Starch. c) Protein d) Lipids
14.	Two stages in photosynthesis – <b>a) Light reaction</b> – Light energy breaks up water molecular into hydrogen and oxygen, called photolysis of water <b>b) Dark reaction</b> – Fixation and conversion of carbon – dioxide (CO <sub>2</sub> ) into a simple carbohydrates glucose.
15.	<b>Ans.</b> During vigorous exercise, anaerobic respiration takes place in human muscles. During exercise our energy requirement increase, so our striated muscles start respiring anaerobically in the lack of oxygen and producers ATP molecules.
16.	<b>Ans.</b> Diaphragm changes its shape during inhalation and exhalation and increases and decreases volume of thoracic cavity respectively. This causes entry and expel of air from lungs.
III.	<b><u>SHORT ANSWER TYPE QUESTIONS CARRYING 3 MARK EACH</u></b>
17.	Fats are present in the intestine in the form of large globules which makes it difficult for enzymes to act on them. Bile salts break them down into

	<p>smaller globules increasing the efficiency of enzyme action. This process is called emulsification.</p> <p>The pancreas secretes pancreatic juice which contains the enzyme lipase for breaking down emulsified fats. The walls of the small intestine contain glands which secrete intestinal juice. The enzyme present in it finally converts fats into fatty acids and glycerol.</p>
18.	<p>Plants exchange gases through stomata, and the large inter-cellular spaces ensure that all cells are in contact with air. Carbon dioxide and oxygen are exchanged by diffusion here. They can go into cells, or away from them and out into the air. The direction of diffusion depends upon the environmental conditions and the requirements of the plant. At night, when there is no photosynthesis occurring, CO<sub>2</sub> elimination is the major exchange activity going on. During the day, CO<sub>2</sub> generated during respiration is used up for photosynthesis; hence there is no CO<sub>2</sub> release. Instead, oxygen release is the major event at this time.</p>
19.	<p>Respiratory pigments take up oxygen from the air in the lungs and carry it to tissues which are deficient in oxygen before releasing it. In human beings, the respiratory pigment is haemoglobin which has a very high affinity for oxygen. This pigment is present in the red blood corpuscles. Carbon dioxide is more soluble in water than oxygen is and hence is mostly transported in the dissolved form in our blood.</p>
20.	<p>Take a plant and keep it in a dark room for three days. Take a de-starched leaf. The leaf is partially covered with black paper on which a design is cut. Expose this plant to sunlight for a few hours and perform a starch test with an iodine solution.</p>
21.	<p><b>Mucous</b> - The mucus protects the inner lining of the stomach from the action of the acid under normal conditions.</p> <p><b>Bicarbonates</b> -HCl produced in the stomach is neutralised by the bicarbonates</p> <p><b>Trypsin</b> - The pancreas secretes pancreatic juice which contains enzymes like trypsin for digesting proteins</p>
<b>IV.</b>	<b><u>LONG ANSWER TYPE QUESTIONS CARRYING 5 MARK EACH</u></b>
22.	<div style="text-align: center;"> <pre> graph LR     Glucose["Glucose (6-carbon molecule)"] -- "In cytoplasm" --&gt; Pyruvate["Pyruvate (3-carbon molecule)"]     Pyruvate -- "Absence of oxygen (Yeast)" --&gt; Ethanol["Ethanol + CO2 + Energy"]     Pyruvate -- "Lack of oxygen (In human muscle cells)" --&gt; Lactic["Lactic acid + Energy"]     Pyruvate -- "Presence of oxygen (In mitochondrial)" --&gt; Water["CO2 + water + Energy"] </pre> </div> <p><b>(Break down of glucose by various pathways)</b></p>
23.	<p>(i) Photosynthesis</p> <p>Photosynthesis. It is the process by which autotrophs take in substances from the outside and convert them into stored forms of energy. This material is taken in the form of carbon dioxide and water which is converted into carbohydrates in the presence of sunlight and chlorophyll.</p> $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ <p style="text-align: center;">(Glucose)</p>



28.	(b) IV
29.	(c) Lactic acid
30.	<p>(a) (i) The first step is the breakdown of glucose, a six-carbon molecule, into a three-carbon molecule called pyruvate. This process takes place in the cytoplasm.</p> <p>(ii) ATP is the energy currency for most cellular processes. The energy released during the process of respiration is used to make an ATP molecule from ADP and inorganic phosphate. When the terminal phosphate linkage in ATP is broken using water, the energy equivalent to 30.5 kJ/mol is released.</p> <p>(iii) During the breathing cycle, when air is taken in and let out, the lungs always contain a residual volume of air so that there is sufficient time for oxygen to be absorbed and for carbon dioxide to be released.</p> <p>(b) Step 1: Keeping the plant in the darkroom:  Step 2: Covering a specific part of a leaf:  Step 3: Exposing the plant to sunlight:  Step 4: Decolorizing the leaf:  Step 5: Adding iodine solution:</p>

Prepared by Mr. Gerard Thomas	Checked by HOD-SCIENCE & FRENCH
----------------------------------	------------------------------------