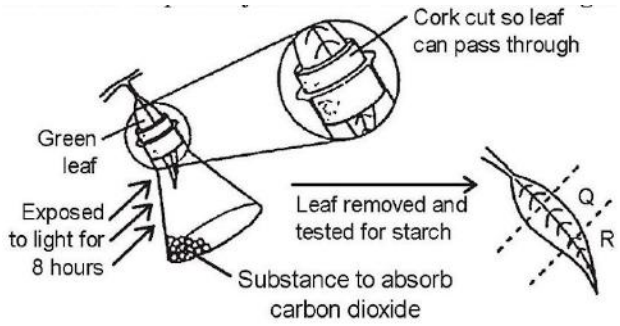
	INDIAN SCHOOL AL WADI AL KABIR	
CLASS: X	**DEPARTMENT OF SCIENCE – 2025-26** **SUBJECT: BIOLOGY**	**DATE: 21/04/2025**
WORKSHEET NO: 1 **WITH ANSWERS**	**TOPIC: LIFE PROCESSES** **(Nutrition and Respiration)**	**A4 FILE FORMAT (PORTFOLIO)**
CLASS & SEC:	**NAME OF THE STUDENT:**	**ROLL NO.**

I OBJECTIVE TYPE QUESTIONS:

1. Which of the following statement(s) is (are) true about respiration?
   (I) During inhalation, ribs move inward and diaphragm is raised
   (II) In the alveoli, exchange of gases takes place i.e., oxygen from alveolar air diffuses into blood and carbon dioxide from blood into alveolar air.
   (III) Haemoglobin has greater affinity for carbon dioxide than oxygen.
   (IV) Alveoli increase surface area for exchange of gases.
   (a) (I) and (IV)
   (b) (II) and (III)
   (c) (I) and (III)
   (d) (II) and (IV)

2. A plant is kept in the dark for two days. A leaf is used in an experiment to investigate the effect of two factors on photosynthesis as shown in the diagram.



What are the colours of Q and R, when the leaf is tested for starch, using iodine solution?
   (a) Q-Blue, R-black
   (b) Q-Brown, R-Brown
   (c) Q- Blue-black, R-Brown
   (d) Q-Brown, R-Blue-black

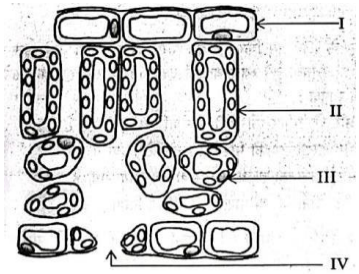
3. In living organisms, which of the following products are not formed if oxygen is not available?
(a) Carbon dioxide + water
(b) Carbon dioxide + alcohol
(c) Lactic acid + alcohol
(d) Carbon dioxide + lactic acid

4. 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.

5. 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.

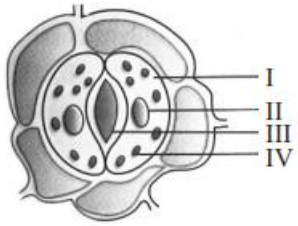
6. The role of nasal cavity in human respiratory system:
(i) Filtration of inhaled air.
(ii) Removal of germs and dust.
(iii) Moistening of the inhaled air.
(a) (i) &(ii)
(b) (ii) & (iii)
(c) (i), (ii) & (iii)
(d) None of these

7. 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



8. In which of the following groups of organisms, food material is broken down outside the body and absorbed?
(a) Mushroom, green plants, Amoeba
(b) Yeast, mushroom, bread mould
(c) Paramecium, Amoeba, Cuscuta
(d) Cuscuta, lice, tapeworm

9. In the sketch of stomatal apparatus, parts I, II, III and IV were labelled differently by four students. The correct labelling is:



(a) I-guard cell, II-stoma, III-starch granule, IV-nucleus
(b) I-cytoplasm II-nucleus, III-stoma, IV-chloroplast
(c) I-guard cell, II-starch, III-nucleus, IV-stoma
(d) I-cytoplasm, II-chloroplast, III-stoma, IV-nucleus

10. The rate at which oxygen moves from the alveoli of our lungs into our blood:
(a) Depends on the difference in oxygen concentration between the alveoli and the blood.
(b) Depends on the color of the alveoli.
(c) Depends on the availability of energy to transport gases across the membrane.
(d) None of the above

11. 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

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below.

i) Both A and R are true and R is the correct explanation of the assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true

12. Assertion(A): Herbivores have longer small intestine as compared to carnivores.
Reason(R): Food takes more time to digest in carnivore

13. Assertion (A): In anaerobic respiration, one of the end products is alcohol.
Reason (R): There is an incomplete breakdown of glucose.

14. Assertion (A): The opening and closing of the stomatal pore is a function of the guard cells.
Reason(R): Stomatal pores are the site for exchange of gases by diffusion.

15. Assertion(A): Although bile juice has no digestive enzymes it is still considered to be very important during digestion of food
Reason(R): Bile provides alkaline medium and emulsifies fat.

II. VERY SHORT QUESTIONS (2M):

16.(a) State the role played by the following in the process of digestion:
(i) Enzyme trypsin
(ii) Enzyme lipase-
(b) List two functions of finger-like projections present in the small intestine.

17. What is common for cuscuta, ticks and leeches?

18. Name the substrates for the following enzymes.
(i) Trypsin (ii) Amylase (iii) Pepsin (iv) Lipase.

19. What type of respiration takes place in human muscles during vigorous exercise and why?

III. SHORT ANSWER TYPE QUESTIONS (3M):

20.How does respiration takes place in plants?

21.Give an experiment to prove the essentiality of light for photosynthesis.

22.What is the role of following in human digestive system?

a) mucous

b) Bicarbonate

23. Write three points of difference between breathing and respiration.

IV. LONG ANSWER TYPE QUESTIONS (5M):

24. a) What are the different ways in which glucose is oxidised to provide energy in various organisms?

b) In each of the following situations, what happens to the rate of photosynthesis?

i) No rainfall in the air

ii) Good manuring in the area

25. i) Draw a diagram of human alimentary canal and label the following parts:

a) Largest gland.

b) Gland that secretes digestive enzymes and hormones.

c) Part where HCl is produced.

d) Part where digested food is absorbed.

ii) What is the role of the diaphragm during inhalation and exhalation?

V. CASE BASED QUESTION: (4 MARK)

26.The maintenance functions of all living organisms must go on even when they are not doing anything particular. Even when we are just sitting in a class or even asleep, this maintenance job has to go on. These maintenance processes require energy to prevent damage and break-down of cells and tissues, which is obtained by the individual organism from the food prepared by the autotrophs, called producers. (2024-25)

(a) Name and define the process by which green plants prepare food.

(b) Write chemical equation involved in the above process.

(c) State in proper sequence the events that occur in synthesis of food by desert plants.

OR

(c) Explain giving reasons what happens to the rate at which the green plants will prepare food

(I) during cloudy weather, and

(Il) when stomata get blocked due to dust.

VI. BOARD BASED QUESTIONS:

27. The breakdown of glucose has taken the following pathway:(2024-25)

$$\text{Glucose} \xrightarrow{(a)} \text{Pyruvate} + \text{Energy} \xrightarrow{(b)} \text{Lactic acid} + \text{Energy}$$

The sites 'a' and 'b' respectively are.

(a) Mitochondria and Oxygen deficient muscle cells

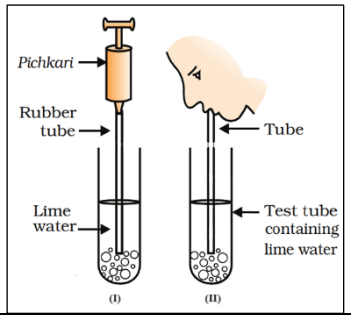
(b) Cytoplasm and Oxygen rich muscle cells

(c) Cytoplasm and Yeast cells

(d) Cytoplasm and Oxygen deficient muscle cells

28. Secretion of less saliva in mouth will effect the conversion of:(2024-25)
    (a) Proteins into amino acids
    (b) Fats into fatty acids and glycerol
    (c) Starch into simple sugars
    (d) Sugars into alcohol

29. Design an experiment to demonstrate that carbon dioxide is essential for photosynthesis. Write the observation and conclusion. (2023-24)
30. In the experimental set up shown in diagram (I) atmospheric air is being passed into lime water with a syringe while in diagram (II) air is being exhaled into lime water. The time taken for the lime water to turn milky in both the test tubes is different. Give reason. (2023-24)

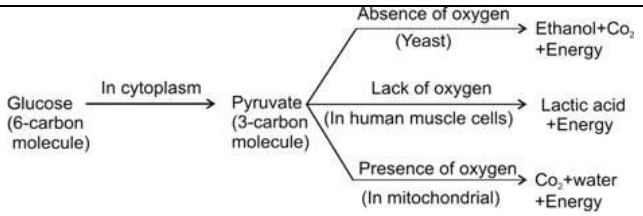
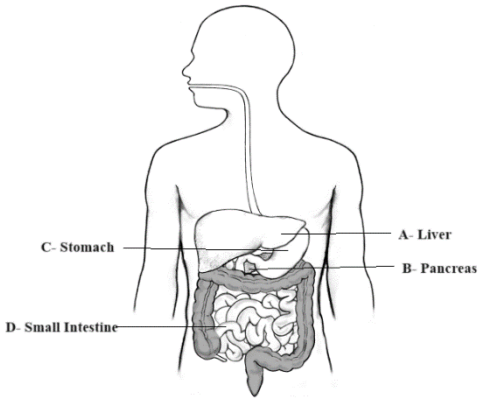


	ANSWER KEY
I	**OBJECTIVE TYPE QUESTIONS:**
1.	(d) (II) and (IV)
2.	(d) Q-Brown, R-Blue-black
3.	(a) Carbon dioxide + water
4.	(b)Stomach and anus.
5.	(b) Parasitic nutrition
6.	(c) (i), (ii) & (iii)
7.	(b) IV
8.	(b) Yeast, mushroom, bread mould
9.	(b) I-cytoplasm II-nucleus, III-stoma, IV-chloroplast
10.	(a) Depends on the difference in oxygen concentration between the alveoli and the blood.
11.	(c) Lactic acid
12.	iii) A is true but R is false
13.	i) Both A and R are true and R is the correct explanation of the assertion.
14.	ii) Both A and R are true but R is not the correct explanation of the assertion.
15.	i) Both A and R are true and R is the correct explanation of the assertion.
II.	**VERY SHORT QUESTIONS (2M):**
16.	(a)(i) Enzyme trypsin: This enzyme is produced by the pancreas. Trypsin converts proteins into peptones and the peptones into peptides and amino acids. (ii) Enzyme lipase: It is secreted by pancreas and small intestine. Lipase converts fats into fatty acids and glycerol. (b) Internally, the wall of the small intestine is provided with long finger-like projections called villi. Two functions of villi are:

	(i) The villi greatly increase the absorptive surface area of the inner lining of small intestine and is also richly supplied with blood vessels. (ii) The large surface area of small intestine helps in rapid absorption of digested food.
17.	Cuscuta, ticks and leeches, all has parasitic mode of nutrition, they harm their host while taking nutrition.
18.	a) Protein b) Starch c) Protein d) Lipids
19.	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 produces ATP molecules.
III.	**SHORT ANSWER TYPE QUESTIONS (3M):**
20.	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. The direction of diffusion depends upon the environmental conditions and the requirements of the plant. At night, when there is no photosynthesis occurring, CO_2 elimination is the major exchange activity going on. During the day, CO_2 generated during respiration is used up for photosynthesis; hence there is no CO_2 release. Instead, oxygen release is the major event at this time.
21.	1)A plant is selected and destarched by keeping it in darkness for 3 days. 2) Cover one leaf with black paper. 3) Expose the plant to sunlight for a day. 4) After a day, test the leaf covered with black paper using iodine. It will not turn blue-black as it has not synthesised starch, while the other uncovered leaves will now turn black-blue on the addition of iodine. Inference**:** Photosynthesis did not occur in the leaf covered with black paper confirming the essentiality of light for the synthesis of starch.
22.	Mucous - The mucus protects the inner lining of the stomach from the action of the acid under normal conditions. Bicarbonates –HCl produced in the stomach is neutralised by the bicarbonates.
23.	

Breathing	Respiration
(i) It is a physical process. It involves inhaling air rich in oxygen and exhaling air rich in carbondioxide.	It is a biochemical process. It involves exchange of respiratory gases and also oxidation of food.
(ii) It is an extracellular process.	It is both an extracellular as well as intracellular process.
(iii) It does not involve enzyme action.	It involves a number of enzymes required for oxidation of food.
(iv) It does not release energy, it consumes energy.	It releases energy.

IV	**LONG ANSWER TYPE QUESTIONS (5M):**

24.	 **(Break down of glucose by various pathways)** i)Photosynthesis is a process by which green plants prepare their own food with the help of oxygen, carbon dioxide, sunlight, water etc. No rain in the area means no availability of water as per definition water is essential for green plants for photosynthesis. So, the rate of photosynthesis decreases. ii) In general, if the soil is rich in minerals due to manuring, the plants will have a good supply of nutrients and show good growth. Hence, the rate of photosynthesis will increase.
25	i)  ii) 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.
V	**CASE-BASED/SOURCE BASED QUESTIONS**
26.	(a) Photosynthesis is a biological process used by plants to prepare their food with the help of sunlight and energy. This process occurs usually when plants use light energy to convert carbon dioxide and water into glucose and oxygen gas. (b) $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \underset{\text{(Glucose)}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$ (c) In desert plants, the stomata is open during night. During night, desert plants absorb carbon dioxide and form an intermediate. Then during day time when the stomata is closed to prevent loss of water, they use this stored carbon dioxide to perform photosynthesis. OR (c) (I) During cloudy weather, the reduced sunlight decreases the rate of photosynthesis, leading to less food production. (II) When stomata are blocked by dust, the gas exchange is impaired, limiting the intake of carbon dioxide and thus reducing the rate of photosynthesis.
VI	**BOARD BASED QUESTIONS**:
27.	(d) Cytoplasm and Oxygen deficient muscle cells

28.	(c) Starch into simple sugars
29.	1)Take two healthy potted plants. 2)Keep them in dark for 2-3 days, so that all the carbon dioxide fixed till that gt used up by the plant. 3)Take the plants and keep both in two separate closed bell jar containers that are air-tight. In one of the jar, keep an open beaker containing potassium hydroxide (KOH) solution along with the plant. KOH can absorb carbon dioxide, so the jar containing KOH is devoid of carbon dioxide. 4)Keep both the jars in sunlight for 4 hours. 5)Pluck the leaves from plants in both jars and remove chlorophyll by boiling in ethanol. 6)Apply iodine solution over the leaves. Observation: The leaves of the plant present in the jar without KOH solution turns blue-black color, as the starch in the leaves reacts with iodine. But, the leaves of the plant in the jar with KOH does not change color as in the absence of carbon dioxide the plant cannot produce starch. Conclusion: Carbondioxde is essential for photosynthesis.
30.	Observation: When we blow air through mouth it turns lime water milky instantaneously. While when we blow air through syringe or pichkari, it takes a lot of time and effort to turn the lime water milky. Explanation: Our body cells produce carbon dioxide through oxidation of food. This gas is exhaled outside through the lungs. Lime water reacts with CO_2 to form an insoluble precipitate. This turns lime water milky. When syringe or pichkari is used, atmospheric air is pushed through the lime water. Atmospheric air contains very less amount of CO_2. As a result, lime water does not turn milky or takes a lot of effort. Inference: This experiment demonstrates that our lung exhales carbon dioxide.

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