
	INDIAN SCHOOL AL WADI AL KABIR	
CLASS: X	DEPARTMENT OF SCIENCE – 2024-2025 SUBJECT: BIOLOGY	DATE OF COMPLETION 14th APRIL, 2024
WORKSHEET NO: 1 WITH ANSWERS	TOPIC: LIFE PROCESSES (Nutrition and Respiration)	A4 FILE FORMAT (PORTFOLIO)
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

OBJECTIVE TYPE QUESTIONS:

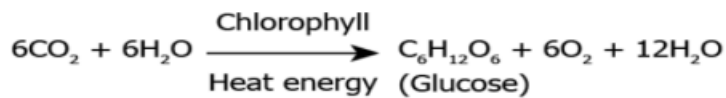
- If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?
 - Proteins breaking down into amino acids
 - Starch breaking down into sugars.
 - Fats breaking down into fatty acids and glycerol.
 - Absorption of vitamins.
- When carrying out the starch test on a leaf, why is it important to boil the leaf in alcohol?
 - To dissolve the waxy cuticle
 - To make the cells more permeable to iodine solution
 - To remove the chlorophyll
 - To stop chemical reactions in the cells.
- A gland not associated with the alimentary canal.
 - Liver
 - salivary gland
 - Pancreas
 - Adrenal gland
- The correct sequence of anaerobic reactions in yeast is:
 - Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Mitochondria}}$ Ethanol + Carbon dioxide
 - Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Cytoplasm}}$ Lactic acid
 - Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Mitochondria}}$ Lactic acid
 - Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Cytoplasm}}$ Ethanol + Carbon dioxide

5. The mode of nutrition in which an organism derives its nutrition from other living organisms without killing it.

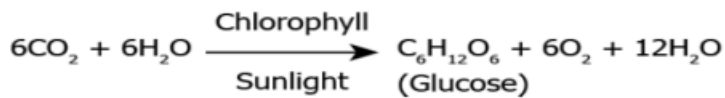
- (a) Saprophytic nutrition
- (b) Parasitic nutrition
- (c) Autotrophic nutrition
- (d) Holozoic nutrition.

6. Which of the equations shows the correct conversion of CO_2 and H_2O into carbohydrates in plants?

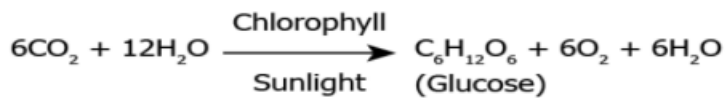
(a)



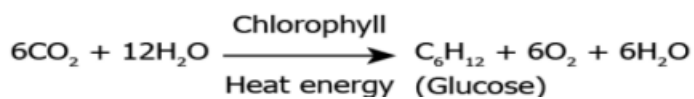
(b)



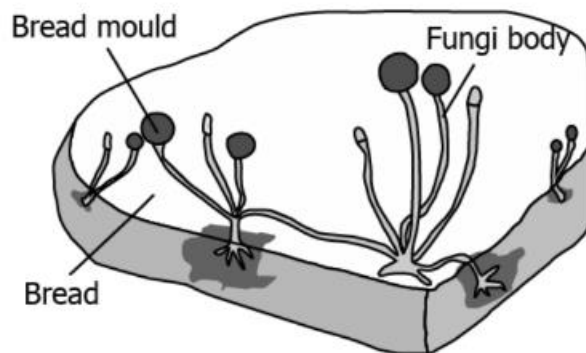
(c)



(d)



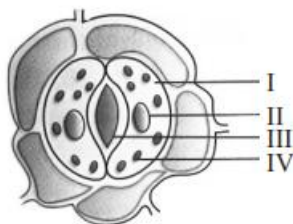
7. The image shows the bread moulds on a bread.



How do these fungi obtain nutrition?

- (a) By eating the bread on which it is growing.
- (b) By using nutrients from the bread to prepare their own food.
- (c) By breaking down the nutrients of bread and then absorbing them.
- (d) By allowing other organisms to grow on the bread and then consuming them.

8. Large intestine in humans mainly carries out:
- Absorption
 - Assimilation
 - digestion of fats
 - digestion of carbohydrates
9. In the following sketch of stomatal apparatus, parts I, II, III and IV were labelled differently by four students. The correct labelling is:



- I-guard cell, II-stoma, III-starch granule, IV-nucleus
 - I-cytoplasm II-nucleus, III-stoma, IV-chloroplast
 - I-guard cell, II-starch, III-nucleus, IV-stoma
 - I-cytoplasm, II-chloroplast, III-stoma, IV-nucleus
10. The rate at which oxygen moves from the alveoli of our lungs into our blood:
- Depends on the difference in oxygen concentration between the alveoli and the blood.
 - Depends on the color of the alveoli.
 - Depends on the availability of energy to transport gases across the membrane.
 - None of the above

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.

- Both A and R are true and R is the correct explanation of the assertion.***
- Both A and R are true but R is not the correct explanation of the assertion.***
- A is true but R is false.***
- A is false but R is true***

11. Assertion (A): Pyruvate is a six-carbon molecule.
Reason (R): It is prepared in the cytoplasm as the first step to cellular respiration.
12. Assertion (A): In anaerobic respiration, one of the end products is alcohol.
Reason (R): There is an incomplete breakdown of glucose.
13. 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.
14. Assertion (A): Bile is essential for the digestion of lipids.
Reason (R): Bile juice contains enzymes.
15. Assertion(A): Pancreatic juice digests starch, proteins and fats.
Reason(R): Pancreatic juice contains digestive enzymes like pancreatic amylase, trypsin and lipase.

II. VERY SHORT ANSWER TYPE 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 the common for Cuscuta, ticks and leeches?
18. Name the substrates for the following enzymes.
(i) Trypsin (ii) Amylase (iii) Pepsin (iv) Lipase.
19. State reasons for the following:
(i) Herbivores need a longer small intestine while carnivores have shorter small intestine.
(ii) The lungs are designed in human beings to maximise the area for exchange of gases.
20. What type of respiration takes place in human muscles during vigorous exercise and why?

III. SHORT ANSWER TYPE QUESTIONS (3M):

21. List the three events that occur during photosynthesis. Write the chemical equation involved in photosynthesis. How is unused glucose stored in plants?
22. How does respiration take place in plants?
23. Give an experiment to prove the essentiality of light for photosynthesis.
24. What is the role of following in human digestive system?
a) mucous
b) Bicarbonate
25. Write three points of difference between breathing and respiration.

IV. LONG ANSWER TYPE QUESTIONS (5M):

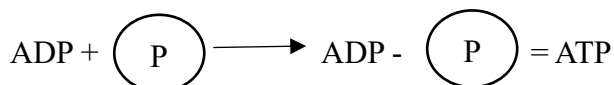
26. a) What are the different ways in which glucose is oxidised to provide energy in various organisms?
b) In each of the following situations, what happens to the rate of photosynthesis?
i) Cloudy days
ii) No rainfall in the air
iii) Good manuring in the area
iv) Stomata get blocked due to dust.
27. 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/SOURCE BASED QUESTIONS.

28.

To sustain life, our body must produce enough energy which is produced by burning of food molecules in the presence of oxygen. Oxidation of food molecules produces carbon dioxide and water. To take in oxygen and to expel our carbon dioxide, respiratory system is present in human beings. The respiratory system starts at the nose and mouth and continues through the airways and the lungs. The energy released during the process of respiration is used to make an ATP molecule from ADP and inorganic phosphate.



P : Phosphate

- (a) What is the function of cilia lined in the trachea?
 (b) What is meant by “Residual volume of air” in breathing cycle?
 (c) Name and draw the balloon like structures present in the lungs. List its two functions.
 (d) Blood is red in colour due to the presence of a pigment. Name the respiratory pigment. Where is it present and what is its function?

VI. BOARD BASED QUESTIONS:

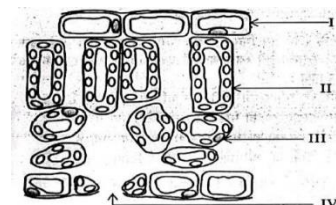
29. Sphincter muscles are present at the exit of:

(2022-23)

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

30. In the following diagram, identify the cells through which massive amounts of gaseous exchange take place for photosynthesis: (2022-23)

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



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

(2022-23)

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

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

(2022-23)

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

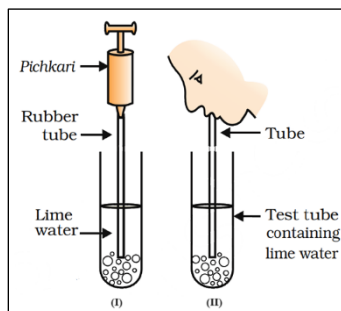
33. Design an experiment to demonstrate that carbon dioxide is essential for photosynthesis.

Write the observation and conclusion.

(2023-24)

34. 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.	(b) Starch breaking down into sugars.
2.	(c) To remove the chlorophyll
3.	(d) Adrenal gland
4.	(d) $\text{Glucose} \xrightarrow{\text{Cytoplasm}} \text{Pyruvate} \xrightarrow{\text{Cytoplasm}} \text{Ethanol} + \text{Carbon dioxide}$
5.	(b) Parasitic nutrition
6.	(c) $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ <p style="text-align: center;">(Glucose)</p>
7.	(c) By breaking down the nutrients of bread and then absorbing them.
8.	(a) Absorption
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.	iv) A is false but R is true
12.	i) Both A and R are true and R is the correct explanation of the assertion.
13.	ii) Both A and R are true but R is not the correct explanation of the assertion.
14.	iii) A is true but R is false.
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:

	<p>(i) The villi greatly increase the absorptive surface area of the inner lining of small intestine and is also richly supplied with blood vessels.</p> <p>(ii) The large surface area of small intestine helps in rapid absorption of digested food.</p>
17.	Cuscuta, ticks and leeches, all have parasitic mode of nutrition, they harm their host while taking nutrition.
18.	a) Protein b) Starch c) Protein d) Lipids
19.	<p>(i) Herbivores have longer small intestines than carnivores because they eat plant and grass-based foods high in cellulose and need a long time to digest.</p> <p>(ii) The trachea is divided into bronchi, and bronchioles. The alveoli are small, round, or balloon-like structures at the ends of the bronchioles that increase surface area and maximize gas exchange in the lungs. Alveoli are also richly supplied with blood vessels.</p>
20.	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):
21.	<p>(i) Absorption of light energy by chlorophyll.</p> <p>(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.</p> <p>(iii) Reduction of carbon dioxide to carbohydrates</p> <p>Glucose produced by photosynthesis is easily soluble in water and it can't be stored in plant. Plants store glucose as starch in leaves which is insoluble and is utilized as a source of energy for life activities.</p>
22.	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.
23.	<p>1) A plant is selected and destarched by keeping it in darkness for 3 days.</p> <p>2) Cover one leaf with black paper.</p> <p>3) Expose the plant to sunlight for a day.</p> <p>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.</p> <p>Inference: Photosynthesis did not occur in the leaf covered with black paper confirming the essentiality of light for the synthesis of starch.</p>
24.	<p>Mucous - The mucus protects the inner lining of the stomach from the action of the acid under normal conditions.</p> <p>Bicarbonates –HCl produced in the stomach is neutralised by the bicarbonates.</p>

25.	Breathing	Respiration
	(i) It is a physical process. It involves inhaling air rich in oxygen and exhaling air rich in carbon dioxide.	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):

26.

(Break down of glucose by various pathways)

i) Decreases ii) Decreases iii) Increases iv) Decreases

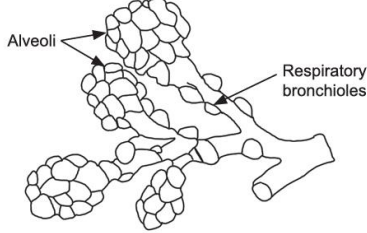
27

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

28. (a) Sweep fluids and foreign particles out of the airway.
 (b) 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>(c) Alveoli</p>  <p>Functions- They provide a large area for exchange of gases. The walls of alveoli contain an extensive network of blood vessels where exchange of gases take place.</p> <p>(d) Blood is red in colour due to the presence of haemoglobin, Haemoglobin is present in RBC. Haemoglobin has high affinity for oxygen and thus binds with oxygen to form oxy haemoglobin and is circulated to all parts of body.</p>
VI	<u>BOARD BASED QUESTIONS:</u>
29.	(b) Stomach and anus.
30.	(b) IV
31.	(c) Lactic acid
32.	<p>(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>
33.	<p>1) Take two healthy potted plants.</p> <p>2) Keep them in dark for 2-3 days, so that all the carbon dioxide fixed till that get used up by the plant.</p> <p>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.</p> <p>4) Keep both the jars in sunlight for 4 hours.</p> <p>5) Pluck the leaves from plants in both jars and remove chlorophyll by boiling in ethanol.</p> <p>6) Apply iodine solution over the leaves.</p> <p>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.</p> <p>Conclusion: Carbon dioxide is essential for photosynthesis.</p>
34.	<p>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.</p> <p>Explanation:</p>

<p>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.</p> <p>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.</p> <p>Inference: This experiment demonstrates that our lung exhales carbon dioxide.</p>

<p>PREPARED BY Ms. SREEJA ARAVINDAKSHAN</p>	<p>CHECKED BY HoD SCIENCE</p>
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