	INDIAN SCHOOL AL WADI AL KABIR	
CLASS: X	**DEPARTMENT OF SCIENCE – 2026-27** **SUBJECT: BIOLOGY**	**DATE: 01/04/2026**
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. The site of photosynthesis in cells is:
a) Mitochondria
b) Nucleus
c) Chloroplast
d) Ribosome

2. Which of the following is an autotroph?
a) Human
b) Mushroom
c) Green plant
d) Amoeba

3. The enzyme present in saliva is:
a) Pepsin
b) Amylase
c) Trypsin
d) Lipase

4. Anaerobic respiration in yeast produces:
a) Ethanol and CO_2
b) Lactic acid
c) Water
d) Oxygen

5. Breakdown of glucose occurs in:
a) Nucleus
b) Cytoplasm
c) Chloroplast
d) Ribosome

6. Energy currency of the cell is:
a) ADP
b) ATP

c) AMP
d) APT

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

7. **A:** Green plants are autotrophs.
   R: They prepare their own food using sunlight.

8. **A:** Bile contains digestive enzymes.
   R: It helps in the emulsification of fats.

9. **A:** HCl is secreted in the stomach.
   R: It creates an acidic medium for trypsin to act.

10. **A:** Aerobic respiration produces more energy than anaerobic respiration.
    R: Glucose is completely broken down in aerobic respiration.

11. **A:** At night, O_2 elimination is the major exchange activity.
    R: At night, there is no photosynthesis occurring in plants.

12. **A:** Lactic acid accumulates in muscles during vigorous exercise.
    R: This is due to a lack of carbon dioxide in the muscles.

II. VERY SHORT QUESTIONS (2M):

13. Define autotrophic nutrition.
14. Write the equation of photosynthesis.
15. What is the role of HCl in the stomach?
16. Define respiration and breathing.
17. Name two end products of anaerobic respiration in muscles.
18. Where does the breakdown of glycose results in the formation of ethanol?

III. SHORT ANSWER TYPE QUESTIONS (3M):

19. Explain the process of nutrition in Amoeba.
20. Explain the steps of photosynthesis process briefly.
21. Write functions of the small intestine.
22. Differentiate between aerobic and anaerobic respiration.
23. Describe the structure of alveoli.
24. Differentiate between respiration in plants and animals.

IV. LONG ANSWER TYPE QUESTIONS (5M):

25. With the help of a labelled diagram, explain the mechanism of stomatal opening and closing.

26. Describe the human digestive system with the functions of each organ.
27. Draw a labelled diagram of the human digestive system and explain the process of digestion in the stomach.
28. With the help of a labelled diagram, describe the human respiratory system.
29. Explain the mechanism of breathing and residual volume.
30. Explain the breakdown of glucose stepwise.

V. CASE-BASED/SOURCE-BASED QUESTIONS.

31. Ananya observed that green plants prepare their own food during daytime. Carbon dioxide enters the leaf through small pores. Chlorophyll helps trap sunlight and convert it into chemical energy.

Attempt either subpart A or B.

A. Name the process by which plants prepare food. Write the chemical equation of this process.

OR

B. Which cell organelle is responsible for this process? Name the pigment involved.
C. Name the pores present on the leaf surface. How do they open?
D. Which gas is released during this process?

32. Meera studied that air enters through the nostrils and reaches the lungs through the trachea. Lungs contain alveoli which help in the exchange of gases.

Attempt either subpart A or B.

A. Name the site of gaseous exchange in the lungs. Mention two structural features that help in this function.

OR

B. How is oxygen transported in human body?
C. Which muscle helps in breathing? What happens to it during inhalation?
D. What happens to carbon dioxide formed in cells?

VI. BOARD BASED QUESTIONS:

33. Secretion of less saliva in the mouth will affect the conversion of: (2025)
(A) proteins into amino acids
(B) fats into fatty acids and glycerol
(C) starch into simple sugars
(D) sugars into alcohol

34. The breakdown of glucose has taken the following pathway: (2025)

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

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

35. 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

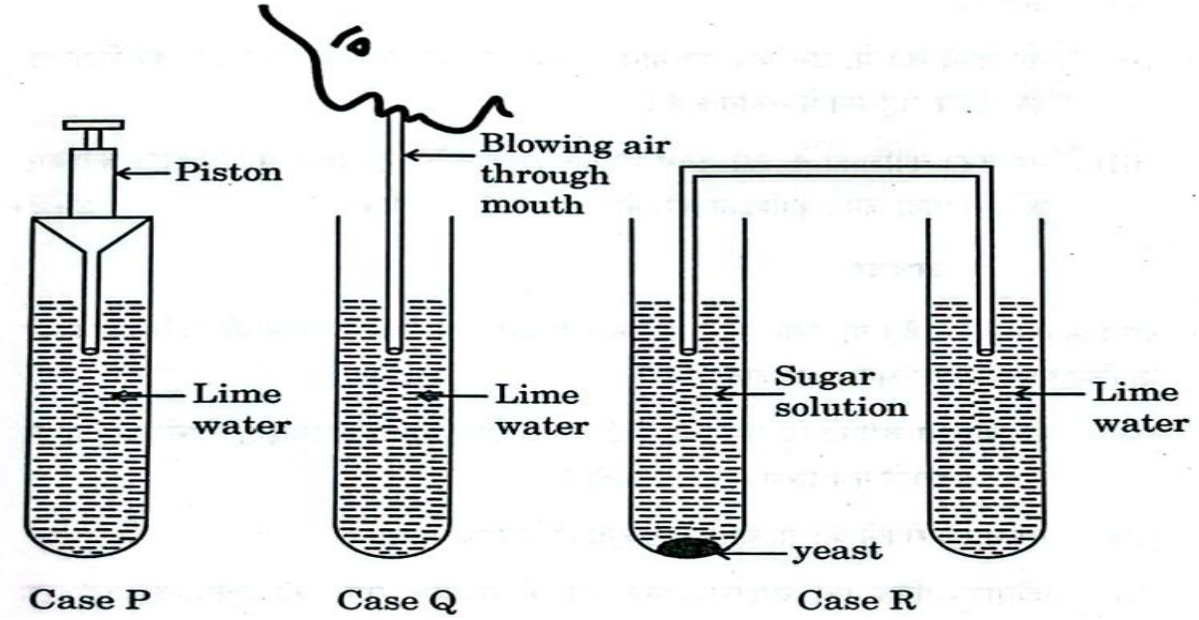
damage and break-down of cells and tissues, which is obtained by the individual organism from the food prepared by the autotrophs, called producers. (2025)
(a) Name and define the process by which green plants prepare food. 1
(b) Write the chemical equation involved in the above process. 1
(c) State in proper sequence the events that occur in the synthesis of food by desert plants. 2

36. If the stomatal pore is open, it indicates which situation from the following (2026)
(A) The guard cells have shrunk.
(B) The water comes out of the guard cells.
(C) Large amount of water is lost through stomata
(D) The guard cells have swelled due to the inflow of water.

37. The following events occur during the process of photosynthesis. Choose the option that indicates the correct events. (2026)
(i) Oxidation of carbon dioxide to carbohydrates
(ii) Conversion of light energy into chemical energy
(iii) Absorption of light energy by chlorophyll
(iv) Conversion of hydrogen and oxygen into water
Options :
(A) (i) and (ii) (B) (ii) and (iii) (C) (iii) and (iv) (D) (iv) and (i)

38. Assertion (A): Blood plasma transports carbon dioxide in dissolved form, while oxygen is transported by respiratory pigments.
Reason (R): Carbon dioxide is more soluble in water than in oxygen. (2026)

39. Observe the following diagrams : (2026) (3 marks)



(a) What changes will be observed in cases 'P', 'Q' and 'R'? Give reasons.
(b) In which cases:
(i) is aerobic respiration is taking place?
(ii) is fermentation is taking place?

40. The carbohydrates which are not used immediately are stored in the form of 'a', which serves as an internal energy reserve. What does 'a' stand for? (2026)

(A) Starch
(B) Sugar
(C) Fat
(D) Protein

41. Select the correct balanced equation for the process of photosynthesis :

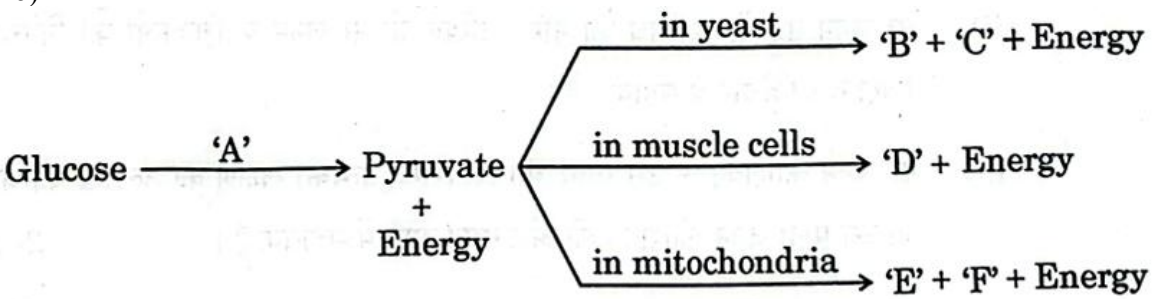
(A) $CO_2 + O_2 + H_2O \xrightarrow{\text{Chlorophyll}} C_6H_{12}O_6 + H_2O$

(B) $6CO_2 + 6H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + O_2$

(C) $CO_2 + H_2O \xrightarrow{\text{Sunlight}} C_6H_{12}O_6$

(D) $6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2 + 6H_2O$

42. Complete the pathways given below, showing the breakdown of glucose. (3 marks) (2026)

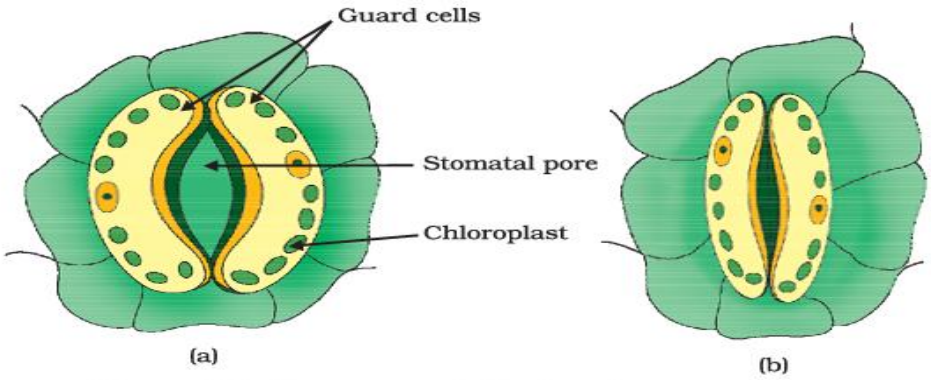


Identify 'A', 'B', 'C', 'D', 'E' and 'F'.

43. (a) Draw a neat diagram of the human respiratory system and label its lungs, trachea, bronchi and alveoli. (2026) (3 marks)
(b) State the roles of the following in the process of respiration:
(i) Alveoli
(ii) Respiratory pigments

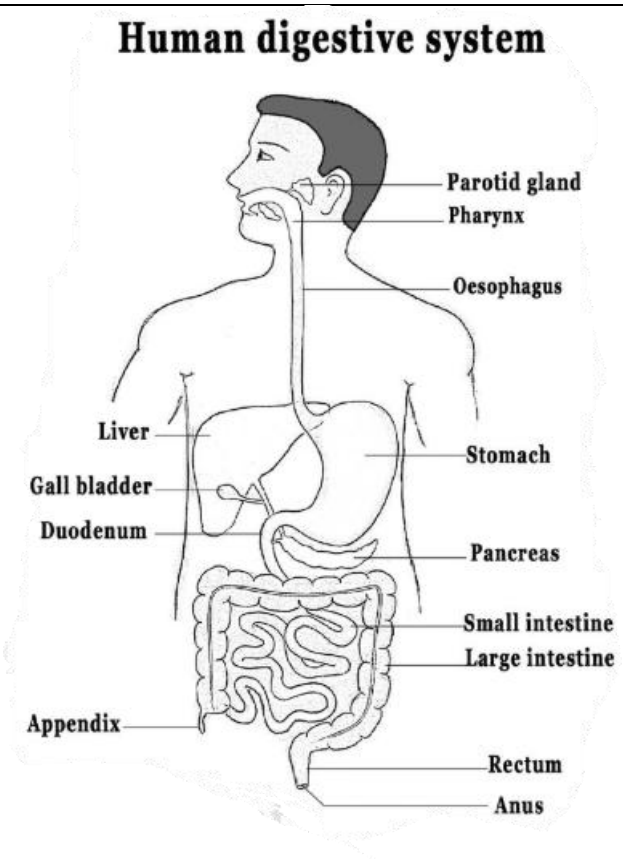
	ANSWER KEY
1.	c) Chloroplast
2.	c) green plant
3.	b) Amylase
4.	a) Ethanol and CO_2
5.	b) Cytoplasm
6.	b) ATP
7.	***i) Both A and R are true and R is the correct explanation of the assertion***
8.	***iv) A is false but R is true***
9.	***iii) A is true but R is false.***
10.	***i) Both A and R are true and R is the correct explanation of the assertion***
11.	***iv) A is false but R is true***
12.	***iii) A is true but R is false***

13.	Mode of nutrition in which organisms prepare their own food from inorganic substances like CO_2 and water using sunlight and chlorophyll.
14.	$6CO_2 + 12H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \underset{\text{(Glucose)}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$
15.	• Makes medium acidic • Activates pepsin • Kills germs
16.	**Respiration** is the biological process by which organisms **break down food molecules to release energy** required for carrying out various life activities. Breathing is a part of the process of respiration during which an organism takes in the oxygen-rich air and gives out air rich in carbon dioxide.
17.	Lactic acid and energy.
18.	Yeast cell
19.	• **Ingestion** – through **oral groove** • Formation of **food vacuole** • **Digestion** – inside food vacuole by enzymes • **Absorption** – nutrients diffuse into cytoplasm • **Assimilation** - obtaining energy from the absorbed food molecules. • **Egestion** – undigested food removed through cell membrane
20.	The following events occur during this process – (i) Absorption of light energy by chlorophyll. (ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen. (iii) Reduction of carbon dioxide to carbohydrates.
21.	The small intestine is the site of the complete digestion of carbohydrates, proteins and fats. It receives the secretions of the liver and pancreas for this purpose. The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzymes to act. Bile juice from the liver accomplishes this in addition to acting on fats. 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 smaller globules increasing the efficiency of enzyme action. The pancreas secretes pancreatic juice which contains enzymes like trypsin for digesting proteins and lipase for breaking down emulsified fats. The walls of the small intestine contain glands which secreted intestinal juice. The enzymes present in it finally break down proteins into amino acids, complex carbohydrates into glucose and fats into fatty acids and glycerol. The digested food is taken up by the walls of the intestine.
22.	**Aerobic and Anaerobic Respiration** **Feature** / **Aerobic Respiration** / **Anaerobic Respiration** **Oxygen required** / Yes / No **End products** / $CO_2 + H_2O$ / Yeast: Ethanol + CO_2; Muscle: Lactic acid **Energy released** / Large amount / Small amount **Location** / Mitochondria / Cytoplasm
23.	• Balloon-like □ Thin walls

	□ Rich blood supply □ Large surface area
24.	<table><tr><th>Respiration in plants</th><th>Respiration in animals</th></tr><tr><td>All the parts of a plant (like root, stem and leaves) perform respiration individually.</td><td>An animal performs respiration as a single unit.</td></tr><tr><td>During respiration in plants, there is a little transport of respiratory gases from one part of the plant to the other.</td><td>Respiratory gases are usually transported over long distance inside an animal during respiration.</td></tr><tr><td>The respiration in plants occurs at a slow rate.</td><td>The respiration in animals occurs at a much faster rate.</td></tr></table>
25.	 ***Figure 5.3*** *(a) Open and (b) closed stomatal pore* **Mechanism of opening & closing of stomata** - 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.

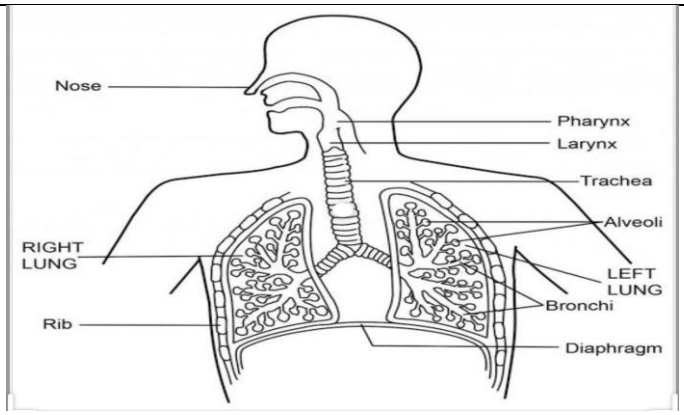
26.	• Mouth: Chewing, saliva
	• Oesophagus: Transport
	• Stomach: Protein digestion
	• Small intestine: Complete digestion & absorption
	• Large intestine: Water absorption
	  • Rectum: It holds faeces that have passed from the **colon**.
	  • Anus: Faeces is removed from the body via the anus. The exit of this waste material is regulated by the anal sphincter.

27.



The digestion in stomach is taken care of by the gastric glands present in the wall of the stomach. These release hydrochloric acid, a protein digesting enzyme called pepsin, and mucus. The hydrochloric acid kills microbes and creates an acidic medium which facilitates the action of the enzyme pepsin. The mucus protects the inner lining of the stomach from the action of the acid under normal conditions. The exit of food from the stomach is regulated by a sphincter muscle which releases it in small amounts into the small intestine.

28.

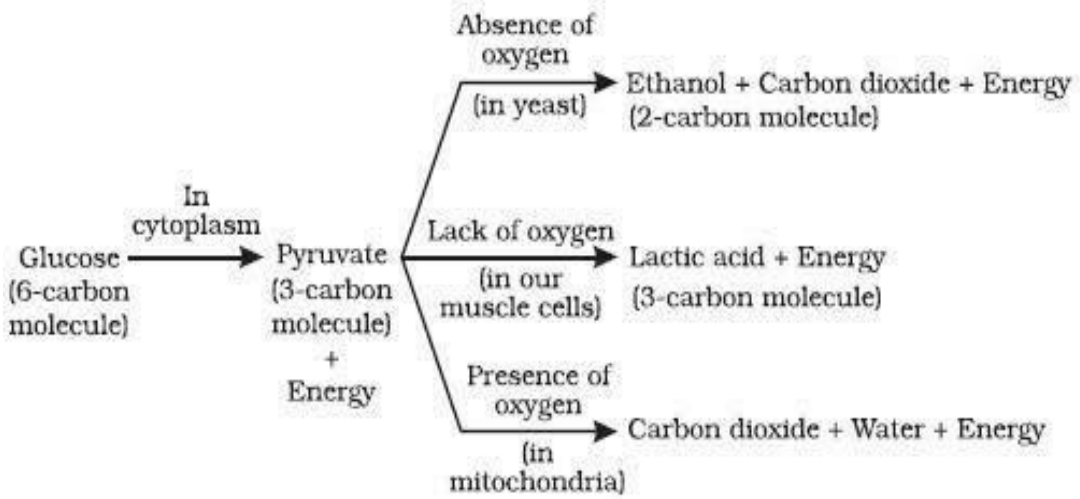


In human beings, air is taken into the body through the nostrils. The air passing through the nostrils is filtered by fine hairs that line the passage. The passage is also lined with mucus which helps in this process. From here, the air passes through the throat via trachea (wind pipe) and into the lungs. Rings of cartilage are present around the trachea. These ensure that the trachea does not collapse.

Within the lungs, the trachea divides into two smaller bronchi and further into smaller tubes the bronchioles which finally terminate in balloon-like structures which are called alveoli.

	The alveoli provide a surface where the exchange of gases can take place. The walls of the alveoli contain an extensive network of blood-vessels.

29.	• **Inhalation:**
	  ○ Ribs lift, diaphragm flattens → chest cavity enlarges → air sucked in.
	• **Exhalation:**
	  ○ Ribs lower, diaphragm relaxes → chest cavity reduces → air expelled.
	
	Residual air: Lungs always contain some air → ensures continuous gas exchange.

30.	The first step is the break-down of glucose, a six-carbon molecule, into a three-carbon molecule called pyruvate. This process takes place in the cytoplasm. i. Further, the pyruvate may be converted into ethanol and carbon dioxide. This process takes place in yeast during fermentation. Since this process takes place in the absence of air (oxygen), it is called anaerobic respiration. ii. Breakdown of pyruvate using oxygen takes place in the mitochondria. This process breaks up the three-carbon pyruvate molecule to give three molecules of carbon dioxide. The other product is water. Since this process takes place in the presence of air (oxygen), it is called aerobic respiration. The release of energy in this aerobic process is a lot greater than in the anaerobic process. iii. Sometimes, when there is a lack of oxygen in our muscle cells, another pathway for the break-down of pyruvate is taken. Here the pyruvate is converted into lactic acid which is also a three-carbon molecule.  Breakdown of glucose by various pathways
31.	A. Photosynthesis **Chemical equation refer answer 14**
	B. Organelle: Chloroplast, Pigment: Chlorophyll
	C. Pores: Stomata They open when guard cells absorb water and become turgid.
	D. Oxygen
32.	A. Site: Alveoli Features: Thin walls, Large surface area, Rich blood supply
	B. Oxygen combines with haemoglobin in blood to form oxyhaemoglobin and is transported to tissues.

	C. Diaphragm. It contracts and moves downward during inhalation.
	D. It is transported through blood to lungs and expelled during exhalation.
33.	(C) starch into simple sugars
34.	(D) Cytoplasm and Oxygen deficient muscle cells
35.	Photosynthesis (a) Definition - **Photosynthesis** is the process by which green plants, in the presence of sunlight and chlorophyll, use carbon dioxide and water to prepare food (glucose) and release oxygen.
	(b) **Chemical equation refer answer 14**
	(c) *Desert plants take up carbon dioxide at night and *prepares an intermediate *which is acted upon by the energy absorbed by the chlorophyll during the day.
36 - 43	Kindly read the text book and find the answers to the given board questions and write it down in your note books.

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