



DEPARTMENT OF SCIENCE 2022-23

BIOLOGY QUESTION BANK - 1

CLASS: X

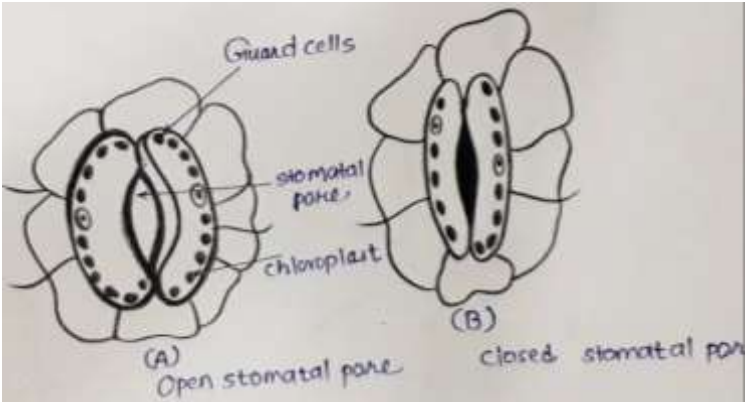
Chapter 6: Life processes

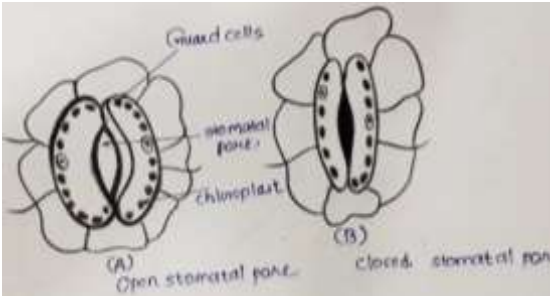
I	<b><u>SHORT ANSWER TYPE QUESTIONS FOR 1 MARK:</u></b>
1.	1)What are enzymes? Ans: Enzymes are biocatalysts that regulate biochemical reactions in organisms.
2.	2)Define life processes. Ans: All biochemical reactions that help in keeping an organism alive are called life processes.
3.	3) Why are the nutritional processes different in different organism? Ans: Depending on the complexity of the carbon sources used as food, the nutritional processes are different in organisms.
4.	4)In what form is reserve energy sources found in plants and animals? Ans: Starch in plants and glycogen in animals. Ans: Trachea doesnot collapse when there is no air in it due to the presence of rings of cartilage around it.
5.	5)Why does the plant close its stomata when it does not need carbon dioxide for photosynthesis? Ans: Since large amounts of water can also be lost through these stomata, the plant closes these pores when it does not need carbon dioxide for photosynthesis.
6.	6)What is the role of acid in our stomach? Ans: i) The hydrochloric acid creates an acidic medium which facilitates the action of the enzyme pepsin.
7.	7) Name the energy currency in the living organisms. When and where is it produced? Ans: ATP is the energy currency in living organisms. It is produced during respiration in the mitochondria.
8.	What is the role of saliva in digestion of food?

	Ans: Saliva helps in softening food to facilitate easy swallowing .It is antimicrobial in action .It has the carbohydrate digesting enzyme - salivary amylase.
9.	Give any two examples for plant parasites. Ans: Cuscuta and Loranthus
10.	10)Give any two examples for saprotrophs. Ans: Mushrooms and yeast
11.	11)What is residual volume? Ans: During the breathing cycle, when air is taken in and let out, the lungs always contains certain of left over air.This is called residual volume .
12.	Cite any two examples for animal parasites. Ans: Leech, Tapeworm
13.	Why does not the trachea collapse when there is no air it? Ans: Trachea doesnot collapse when there is no air in it due to the presence of rings of cartilage around it.
14.	In which type of respiration is the energy release more and why? Ans: More energy is released in aerobic respiration as it involves complete oxidation of glucose in the presence of oxygen.
15.	What causes muscle cramps? Ans: Muscle cramps are caused to accumulation of lactic acid in the muscle cells as a result of anaerobic respiration.
16.	16)Name the structures in plants that help in exchange of gases. Ans: Stomata in leaves, Lenticels in stem and root hairs in roots.
17.	17)What is a respiratory pigment? Ans: Carrier protein molecules that help in carrying respiratory pigments is called respiratory pigment.
18.	18)What is breathing? Ans: It is the mechanical movement of air in and out of the chest cavity.It involves two stages- Inhalation and Exhalation.
19.	19)Why is the respiratory rate higher in aquatic organisms? Ans: Aquatic organisms take in oxygen dissolved in water and this is very less compared to atmospheric oxygen. So the respiratory rate is high in aquatic organisms.

20.	20)If the stomata is blocked how does it affect the photosynthetic rate in plants? Ans: The photosynthetic rate would decrease as Carbon dioxide cannot enter due to the blocked stomata.				
<b><u>SHORT ANSWER TYPE QUESTIONS FOR 2MARKS:</u></b>					
21.	List the raw materials for photosynthesis and also state their source. Ans: Carbon dioxide from air Water from soil, Light energy from sun/light source, Chlorophyll in the leaves				
22.	Simple diffusion will help in meeting all the requirements of unicellular organisms but not in multicellular organisms. Why? Ans: In the case of a single-celled organism, the entire surface of the organism is in contact with the environment and so simple diffusion helps in exchange of materials between organism and surroundings. But in multi-cellular organisms, due to increased complexity and size, all the cells may not be in direct contact with the surrounding environment. Thus, simple diffusion will not meet the requirements of all the cells.				
23.	Why do desert plants take up carbon dioxide only at night time? Ans : In desert plants,the stomata remains closed during daytime to prevent water loss and opens only at night time.So these desert plants can take up carbon dioxide only during night time when the stomata is opened.				
24.	What is the importance of nitrogen in plants? How do they obtain nitrogen? Ans: Nitrogen is essential for the formation of amino acids and proteins. Plants take up nitrogen from the soil in the form of inorganic and organic nitrates or nitrites as they cannot take up atmospheric nitrogen				
25.	Differentiate between autotrophic and heterotrophic nutrition.				
	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Autotrophic nutrition</th> <th style="width: 50%;">Heterotrophic nutrition</th> </tr> </thead> <tbody> <tr> <td>Autotrophic nutrition is the mode of nutrition in which an organism prepares its own food from simple inorganic raw materials.</td> <td>Heterotrophic nutrition is the mode of nutrition in which an organism cannot</td> </tr> </tbody> </table>	Autotrophic nutrition	Heterotrophic nutrition	Autotrophic nutrition is the mode of nutrition in which an organism prepares its own food from simple inorganic raw materials.	Heterotrophic nutrition is the mode of nutrition in which an organism cannot
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		prepare its own food and so depend on pre prepared organic substances as food.
	In autotrophic nutrition, inorganic gets converted into organic substances	In heterotrophic nutrition there is no conversion involved.
26.	Differentiate between parasitic and saprotrophic nutrition.	
	Parasitic nutrition	Saprotrophic nutrition
	Parasitic nutrition is a heterotrophic mode of nutrition where an organism derives its nourishment from another living organism causing harm to it.	Saprotrophic nutrition is a heterotrophic mode of nutrition where an organism derives its nourishment from dead and decayed remains.
27.	<p>What are the characteristic features of a good respiratory surface?</p> <p>Ans: The characteristic features of a good respiratory surface are :</p> <p>i) Large surface area.</p> <p>ii) Moist and permeable.</p> <p>iii) Richly vascularised.</p> <p>iv) Fine and delicate</p>	
28.	<p>Why are the respiratory structures different in aquatic and terrestrial animals?</p> <p>Ans: The respiratory structures in fishes are gills which are designed to absorb oxygen dissolved in water and the respiratory structures in terrestrial organisms are lungs which can take in atmospheric oxygen.</p>	
29.	<p>Why do herbivores have a longer small intestine than carnivores?</p> <p>Ans: Herbivores eating grass need a longer small intestine to allow the cellulose to be digested. Meat is easier to digest, hence carnivores have a shorter small intestine.</p>	
30.	<p>What are the structural specialities of small intestine that makes it the site of absorption?</p> <p>Ans: The digested food is taken up by the walls of the intestine. The inner lining of the small intestine has numerous finger-like projections called villi which increase the surface area for absorption. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.</p>	
31.	<p>What is the difference between ingestion and egestion?</p>	

	<p>Ans: Ingestion is the process of taking of food and egestion is the process of removing undigested food materials from the body.</p>
32.	<p>Bile does not contain any enzymes, yet it plays a crucial role in digestion. Justify this statement.</p> <p>Ans: Bile does not contain any enzymes but it helps in the process of neutralisation of acidic content coming from the stomach and also in emulsification of fats.</p>
33.	<p>Briefly explain what happens to food in the buccal cavity.</p> <p>Ans: In the buccal cavity food is masticated and acted upon by saliva.</p>
34.	<p>What is peristalsis? State its significance.</p> <p>Ans: The wave like movement of food through the food pipe by the alternate contractions and relaxations of the gut wall muscles is called peristalsis.</p>
35.	<p>State the function of large intestine.</p> <p>Ans: The unabsorbed food is sent into the large intestine where more villi absorb water from the material. So it helps in concentrating the undigested food materials.</p>
36.	<p>Draw neat labelled diagrams to show open and closed state of stomata.</p> <p>Ans:</p> 
37.	<p>Differentiate between nutrition in paramecium and amoeba.</p> <p>Ans: In Paramecium, the cell has a definite shape and food is taken in at a specific spot. Food is moved to this spot by the movement of cilia which cover the entire surface of the cell.</p>
38.	<p>What is muscle cramp? How can it be rectified?</p> <p>Ans: The muscle becomes stiff due to accumulation of lactic acid in it. The cramp can be dissolved by applying heat or pressure to that area and thereby increase blood flow to that region.</p>

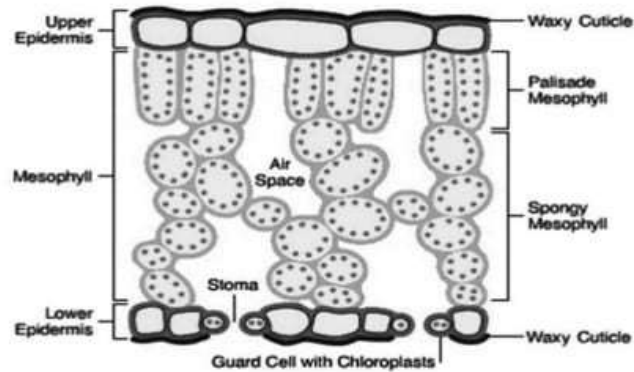
39.	<p>39) State the importance of diaphragm in the mechanism of breathing.</p> <p>Ans: Diaphragm helps in changing the chest cavity volume for breathing to take place. Breathing depends on the pressure and volume change in chest cavity.</p>
40.	<p>How is oxygen and carbon dioxide transported in the human body?</p> <p>Ans: Oxygen is carried by haemoglobin present on RBC and carbon dioxide is carried in dissolved form through the plasma of blood.</p>
<b><u>SHORT ANSWER TYPE QUESTIONS FOR 3 MARKS:</u></b>	
41.	<p>Briefly explain the mechanism of photosynthesis.</p> <p>Ans : Photosynthesis involves the following events/steps:</p> <p>i) Absorption of light by chlorophyll</p> <p>ii) Conversion of light energy into energy molecules (ATP and NADPH) and splitting of water (photolysis).</p> <p>iii) Reduction of carbon dioxide into carbohydrate</p>
42.	<p>Explain how guard cells regulate opening and closing of stomata.</p> <p>Ans : The opening and closing of the stomata is controlled by 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 by losing water.</p> 
43.	<p>a) In the process of respiration, state the function of alveoli.</p> <p>(b) A fish dies if taken out of water. Give reason.</p> <p>(c) Complete the following pathway showing the breakdown of glucose:</p> $\text{Glucose (6-carbon molecules)} \xrightarrow{\text{in cytoplasm}} \text{(i) } \frac{?}{\text{(3-carbon molecules + energy)}} \xrightarrow[\text{in mitochondria}]{\text{Presence of O}_2} \text{(ii) } \frac{?}{\text{+ H}_2\text{O + energy}}$

	<p>Ans: a) Alveoli are the regions of gaseous exchange with cells by diffusion.</p> <p>b) Fishes respire through gills and gills can only take in oxygen dissolved in water and not atmospheric oxygen. So fish dies due to lack of oxygen.</p> <p>c) i)Pyruvate            ii)Carbon dioxide</p>
44.	<p>The inner lining of the walls of the small intestine has numerous finger- like projections. What are they called and what is their function?</p> <p>Ans: The finger-like projections are called villi. They increase the surface area of absorption and as they are richly supplied with blood, absorption of nutrients from gut to the blood becomes easy.</p>
45.	<p>Write an activity to show the action of saliva on food.</p> <p>Ans: About 1 mL starch solution is taken in two test tubes (A and B).</p> <p>1 mL of saliva to test tube A and leave both test tubes undisturbed for 20-30 minutes.</p> <p>Now add a few drops of dilute iodine solution to the test tubes.</p> <p>In test tube B, we can see blue black colour. In test tube A no colour change is seen.</p> <p>This indicates the presence of starch in test tube B and absence of starch in the test tube A.</p> <p>This shows that starch in test tube A was acted upon by saliva, so no starch in it after sometime.</p>
	<b><u>LONG ANSWER TYRPE QUESTIONS FOR 5 MARKS :</u></b>
46.	<p>Describe an experiment to demonstrate that chlorophyll is essential for photosynthesis.</p> <p>Ans: <b>Procedure:</b> Take a potted plant with variegated leaves and keep it in a dark room for 3 days. This will stop photosynthesis and destarch the plant.</p> <p>Then keep the plant in sunlight for 6 to 8 hours. The plant can now carry out photosynthesis and produce starch.</p> <p>Mark the green areas in the leaf and trace them on a sheet of paper. Mark the regions as green and yellow.The green areas contain chlorophyll which is absent in the yellow areas.</p> <p>Boil the leaf in alcohol to dechlorophyll it. The leaf slowly loses its green colour, which goes into the alcohol.</p>

	<p>Dip this decolourized leaf in iodine solution. Now remove the leaf from the iodine solution and rinse it in distilled water. Remove the leaf from distilled water and keep it on a petri dish.</p> <p><b>Observation:</b> Two colour regions are visible in the leaf. They are reddish-brown and blue-black</p> <p><b>Conclusion:</b> We can conclude that the earlier green parts of the leaf turn blue-black whereas the yellow parts have become reddish-brown.</p> <p>Green parts of the leaf possess chlorophyll; hence they carry out photosynthesis and produce starch, which turns blue-black with iodine.</p>
47.	<p>Describe an experiment to demonstrate that carbon dioxide is essential for photosynthesis.</p> <p>Ans: Procedure :</p> <p>Keep the potted plants in dark for three days, so that the leaves are destarched.</p> <p>Place the potted plant (A) on a glass plate and put a watch glass containing potassium hydroxide (KOH) by the side of the pot. Cover it with a bell jar.</p> <p>Place the other potted plant (B) on second glass plate and cover it with a bell jar.</p> <p>Use Vaseline to seal the bottom of jars to the glass plates so that the set up is air tight.</p> <p>Keep the plants in sunlight for two hours.</p> <p>Pluck a leaf from each plant and test the same for the presence of starch.</p> <p>Observation :</p> <p>The leaf of plant (A) without potassium hydroxide turns blue-black, while the leaf of plant (A) with potassium hydroxide remains pale coloured or colourless.</p> <p>Conclusion :</p> <p>This experiment demonstrates that the leaf of plant (B) has synthesised starch by photosynthesis. Leaf of plant (A) has not synthesised starch as it does not contain carbon dioxide which is essential for photosynthesis. CO<sub>2</sub> is absorbed by KOH. So, photosynthesis did not occur in plant (A).</p>
48.	<p>(i) Draw a section of a leaf and label the following parts: (a) chloroplast (b) guard cells</p> <p>(ii) A gas is used during photosynthesis. Name the gas and also state what happens to it.</p> <p>(iii) In certain group of plants, stomata remain closed during the day. How is food synthesized by such plants? Also name them.</p>



Ans: i)



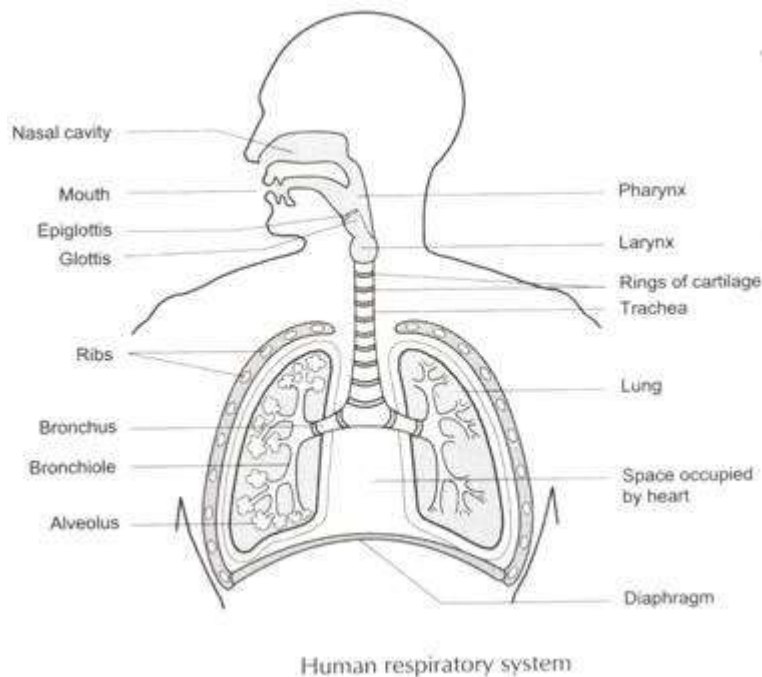
ii) The gas used in photosynthesis is  $\text{CO}_2$  and it gets reduced into glucose.

iii) Desert plants take up carbon dioxide at night as stomata is closed during daytime and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day.

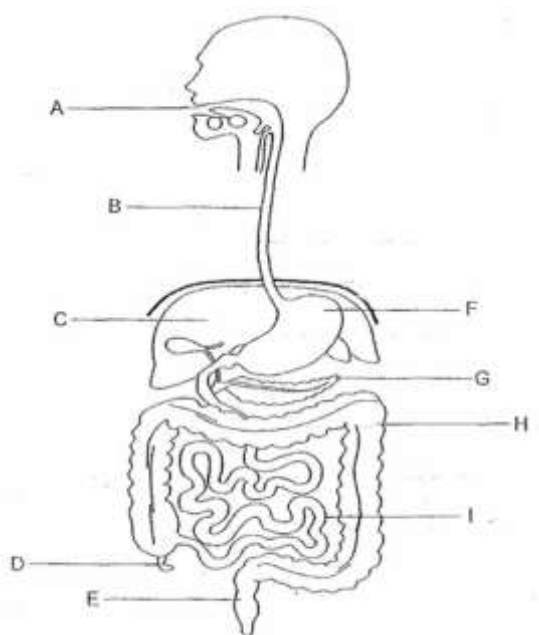
49. i) Draw the human respiratory system and label the following: Larynx, bronchioles, rings of cartilage.

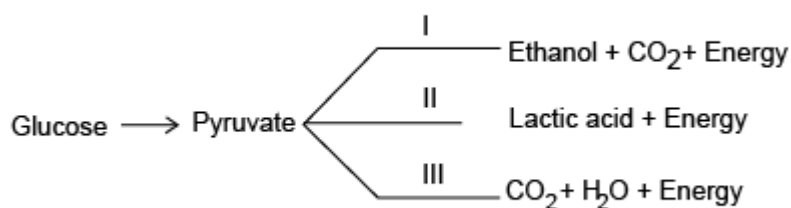
(ii) During the breathing cycle, what is the advantage of residual volume?

Ans: i)



	<p>ii) Residual volume of air ensures that there is sufficient time for oxygen to be absorbed and for the carbon dioxide to be released.</p>
50.	<p>(i) 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 tumour. Now, would you suggest a plant based or a meat based diet for the bear after its recovery? Give reason for your answer.</p> <p>(ii) Explain gastric digestion.</p> <p>Ans: (i) Meat based diet as it will take less time for digestion. For digesting plant matter more time is required. As length of intestine is reduced, digestion cannot take place for long time.</p> <p>ii) Gastric digestion occurs by the action of gastric glands present in the wall of the stomach. These release hydrochloric acid, a protein digesting enzyme called pepsin, and mucus. The hydrochloric acid creates an acidic medium which facilitates the action of the enzyme pepsin.</p> <p>Mucus protects the inner lining of the stomach from the action of the acid under normal conditions.</p> <p>Pepsin starts protein digestion in the stomach.</p>
51.	<p>Explain with the help of neat diagrams nutrition in amoeba.</p> <p>Ans:</p> <div data-bbox="272 1226 1487 1591" data-label="Diagram"> <p style="text-align: center;">Different stages in the nutrition of <i>Amoeba</i></p> </div> <p>Amoeba takes in food using temporary finger-like extensions of the cell surface which fuse over the food particle forming a food-vacuole.</p> <p>Inside the food vacuole, complex substances are broken down into simpler ones by the action of digestive enzymes which then diffuse into the cytoplasm and are assimilated there itself.</p>

	The remaining undigested material is moved to the surface of the cell and thrown out.
52.	<p>(i) Identify the parts labelled C and F in the alimentary canal diagram.</p>  <p>(ii) Explain the role of the parts labelled G in digestion.</p> <p>(iii) Give an account of end products of digestion in humans.</p> <p>Ans: i) C- Liver                      F- Stomach</p> <p>ii) G is pancreas that produces pancreatic juice that has the carbohydrate digesting enzyme -pancreatic amylase, Protein digesting enzyme -Trypsin and fat digesting enzyme- Pancreatic lipase which act on the food in the small intestine during digestion.</p> <p>iii) End products of digestion are :</p> <p>Carbohydrates get converted to Glucose, Proteins get converted to amino acids, Fats get converted into Fatty acids and Glycerol.</p>
53.	<p>(i) Differentiate between aerobic and anaerobic respiration.</p> <p>(ii) Which of the equations shown below represent the respiration in the muscle cells of an athlete while he is running a race?</p>



Ans: i)

Aerobic respiration	Anaerobic respiration
i) The oxidation of glucose in the presence of oxygen is called aerobic respiration.	i) The oxidation of glucose in the presence of oxygen is called aerobic respiration.
ii) The food is completely oxidised in aerobic respiration.	ii) The food is incompletely oxidised in anaerobic respiration.
iii) More energy is released.	iii) Energy released is less.
iv) The end products are carbon dioxide, water and ATP.	iv) The end products are alcohol or lactic acid, Carbon dioxide and less ATP molecules.

ii) Equation II represents anaerobic respiration in muscle cells.

54. (i) Briefly explain the mechanism of respiration in fishes.

(ii) Explain how gills serve as respiratory surface in fishes.

Ans: (i) Fishes take in water through their mouths and force it past the gills.

Gills are richly vascularised and so by diffusion oxygen moves into the blood from water and carbon dioxide from the blood moves into the water.

Water containing dissolved carbon dioxide is expelled by the opening of the operculum.

(ii) Gills have characteristics of a good respiratory surface like being delicate, moist, permeable to respiratory gases and having good blood supply around it.

55. Give a brief account of carbohydrate digestion in humans.

	<p>Ans: Carbohydrate digestion begins in the buccal cavity of humans by the action of the enzyme- Salivary amylase present in saliva.</p> <p>In the stomach there is no carbohydrate digestion as amylases cannot act in a acid medium.</p> <p>In the first part of small intestine-duodenum, carbohydrate digestion occurs by the action of pancreatic amylase- the carbohydrate digesting enzyme present in pancreatic juice.</p> <p>In the remaining part of the small intestine the digestion of carbohydrates is completed by amylases present in intestinal juice.</p> <p>The end product of carbohydrate digestion is glucose.</p>
56.	<p>Breathing is the movement of air in and out of the respiratory tract. It involves two stages- Inhalation and Exhalation.</p> <p>Inhalation – During inhalation, the chest cavity volume increases by the flattening and lowering of the dome shaped diaphragm and outward movement of rib cage. Due to increase in volume, pressure of air drops in the chest cavity and this causes inward movement of air from outside into the respiratory tract.</p> <p>Exhalation – During exhalation, the chest cavity volume reduces due to returning of diaphragm and ribcages back to their positions. The reduced volume increases the pressure in the cavity and this pushes the air out of the chest cavity to the respiratory tract and thereby to the external environment.</p>
57.	<p>How are the lungs designed in human beings to maximise the area for exchange of gases?</p> <p>Ans: In humans, a pair of lungs are designed in such a way that they are lined by a thin membrane, the smaller tubes called bronchioles, balloon-like structure called alveoli and a network of blood capillaries increase the surface area for the exchange of gases. They are soft spongy and elastic organs enclosed in a thin membrane. Inside the lungs, the oxygen is exchanged for carbon dioxide waste through air sacs called alveoli. Alveoli are small, round or balloon-like structures found at the end of the bronchioles and provide a larger surface area and maximizes the exchange of gases inside the lungs. The inhaled oxygen diffuses into the pulmonary capillaries, binds to haemoglobin and is pumped through the bloodstream. The carbon dioxide from the blood diffuses into the alveoli and is expelled through exhalation.</p>

58.	<p>(i) Explain the ways in which glucose is broken down in the absence or shortage of oxygen. Give any two industrial applications of any of these.</p> <p>(ii) How is ATP produced and what is the significance of it?</p> <p>Ans: (i) The first step in the breakdown of glucose is same for all types of respiration. Glucose is converted to pyruvate.</p> <p>Pyruvate in the absence of oxygen gets converted into Ethanol and carbon dioxide and energy.</p> <p>In the shortage of oxygen as in muscle cells, Pyruvate gets converted into Lactic acid and Energy.</p> <p>The anaerobic breakdown of glucose into alcohol is called fermentation which is used in preparation of alcoholic beverages like beer, wines etc. and also in making of breads and bakery products.</p> <p>(ii) The energy released during cellular respiration is immediately used to synthesise a molecule called ATP which is used to fuel all other activities in the cell.</p>
59.	<p>Describe an activity each to demonstrate products of anaerobic and aerobic respiration.</p> <p>Ans: <u>Activity to show end products of anaerobic respiration</u></p> <p>Take some fruit juice or sugar solution and add some yeast to this. Take this mixture in a test tube fitted with a one-holed cork. Fit the cork with a bent glass tube. Dip the free end of the glass tube into a test tube containing freshly prepared lime water.</p> <p>Observation- The lime water turns milky.</p> <p>Conclusion – The fruit juice has undergone anaerobic breakdown releasing carbon dioxide which turned lime water milky.</p> <p><u>Activity to show products of aerobic respiration</u></p> <p>Take some freshly prepared lime water in a test tube. Blow air through this lime water.</p> <p>Observation- The lime water turns milky.</p> <p>Conclusion- The air we blew into the lime water contains carbon dioxide. One of the end products of aerobic respiration is carbon dioxide.</p>
60.	<p>Give a brief account of the digestive glands and their secretions in the human body.</p> <p>Ans; the major digestive glands of human digestive system are:</p> <p>i) Salivary glands that produce saliva which contains the enzyme salivary amylase.</p>

ii)Gastric glands that produce gastric juice which contains the enzyme pepsin for protein digestion.

iii)Pancreas that produces pancreatic juice which contains pancreatic amylase, pancreatic lipase and lipase.

iv)Liver that produces Bile.

v)Intestinal glands that produce intestinal juice that completes the process of digestion.