# CHAPTER 6

# Life Process

## ONE MARK QUESTIONS

1. Which is the universal source of energy in all cells?
**Ans :** [Delhi 2017]

ATP, Adenosine Tri Phosphate.

2. If no apparent work is being done by an organism, why does it takes food? [All India 2017]
**Ans :**

To carry out life processes, growth, reproduction and for repair of worn out tissues.

3. Which pathway is common to both aerobic and anaerobic respiration? [All India 2012]
**Ans :**

Glycolysis.

4. What would be the consequences of deficiency of haemoglobin in our bodies? [Foreign 2012]
**Ans :**

Anaemia.

5. How does nutrition in a fungus different from that in a tapeworm? [CBSE 2011 C]
**Ans :**

Fungus derives its nutrition either by parasitic or saprophytic manner while tapeworm is only parasitic.

6. Name mode of nutrition in the following organisms:
(a) Fungi (b) Amoeba
**Ans :** [All India 2011]

a. Fungi - saprophytic
b. Amoeba — animal like nutrition

7. What is peristalsis? [Delhi 2011]
**Ans :**

Contraction and expansion of alimentary canal to push the food forward is called peristalsis.

8. What is the role of cartilaginous rings on trachea?
**Ans :** [All India 2010]

They prevent the collapsing of trachea when there is no air present in it.

9. Name the type of blood vessels, which carry blood from organs to the heart.
**Ans :** [All India 2010]

Veins.

10. How is the passage of food regulated from stomach onwards?
**Ans :** [Delhi 2010]

Food is passed down to small intestine through sphincter muscles present in last part of stomach.

11. What is the stored form of carbohydrates in plants and animals respectively?
**Ans :** **[Foreign 2009]**

Starch and glycogen.

12. What is the meaning of variegated leaf?
**Ans :** [All India 2009]

Variegated leaf means leaf with some green and some non-green part.

13. Define the term ' translocation'. [Delhi 2008]
**Ans :**

Transport of food from leaves to other parts of the plant is called translocation.

14. Why is respiration considered an exothermic process?
**Ans :** [All India 2008]

Respiration is considered an exothermic process due to breaking down of glucose/food in the presence of oxygen with release of energy.

15. What is breathing? [All India 2008]
**Ans :**

The mechanism by which organisms intake oxygen from the environment and release carbon dioxide is called breathing.

16. Mention two ways in which food gets oxidized in organisms. [CBSE 2008C]
**Ans :**

Aerobic respiration and anaerobic respiration.

**17.** What role do digestive enzymes play in the alimentary canal? [CBSE 2008C]

**Ans :**

Digestive enzymes break down complex molecules of food into simpler ones so that they can be absorbed by blood.

**18.** Which enzyme is present in human saliva?

**Ans :** [Foreign 2008]

Salivary amylase or ptyalin.

**19.** What are the end products of photosynthesis?

**Ans :** [All India 2008]

Glucose, oxygen and water.

**20.** Give two examples of variegated leaves.

**Ans :** [Delhi 2008]

Crotons, money plant.

## TWO MARKS QUESTIONS

**21.** What is Lymph? How is it different from blood?

**Ans :** [All India 2018]

Lymph is the light yellow fluid containing lymphocyte, which fights against infections.

| | Blood | Lymph |
|---|---|---|
| 1. | Blood is pumped throughout the body by heart. | Lymph is moved along through the normal function of the body. |
| 2. | Blood transports oxygen throughout the body. | Lymph removes waste from the system. |
| 3. | Blood flows through the body in a circular motion. | The movement of lymph is in a single direction. |
| 4. | Blood contains red blood cells, white blood cells and platelets. | Lymph is a light yellow and clear liquid. |
| 5. | We can see blood with the naked eyes. | Lymph cannot be seen with the naked eyes. |
| 6. | The kidney purify the blood. | Lymph is purified in the nodes itself. |

**22.** How are fats digested in our bodies? Where does this process take place? [Delhi 2017]

**Ans :**

Fats are first emulsified with the help of bile salts followed by their breakdown in fatty acids and glycerol due to the action of lipase. All these events take place in first part of small intestine-duodenum.
Saprophytic

**23.** Differentiate between saprophytic nutrition and parasitic nutrition based on the type of food and manner of obtaining it. [Delhi 2017]

**Ans :**

| | Saprophytic Nutrition | Parasitic Nutrition |
|---|---|---|
| 1. | Taking dead decay organic matter in the form of food is called saprophytic nutrition. | Living on or inside other organisms and deriving their food from them without killing them. |
| 2. | It shows extracellular digestion. | It has intracellular digestion. |
| 3. | It does not depend on living host. | It causes harm to the organism. |
| 4. | E.g., fungi and bacteria. | E.g., lice, tapeworm, leech. |

**24.** How do plants exchange gases?

**Ans :** [Foreign 2017]

Plants exchange gases through stomata. Large intercellular spaces ensure that each cell is in contact with air. Carbon dioxide and oxygen are exchanged here.

**25.** List two factors which decide direction of diffusion of oxygen and carbon dioxide.

**Ans :** [All India 2017]

Environmental conditions and requirement of the plants decide direction of diffusion of oxygen and carbon dioxide.

**26.** What are the strategies of plants to get rid of their wastes?

**Ans :** [All India 2017]

a. They throw away oxygen and water vapour through stomata.
b. Some wastes like gums, oil and resins may be stored in old xylem or wood in stem.
c. Some wastes may be stored in leaves and bark and shed off from time to time.
d. Roots can also throw some wastes.

**27.** How is respiration different in plants and animals?

**Ans :** [All India 20171

| | Respiration in Plants | Respiration in Animals |
|---|---|---|
| 1. | It occurs through stomata, lenticels, root, etc. | It occurs through lungs. |
| 2. | It occurs through stomata, lenticels, root, etc. | Animals release CO2 as waste into the atmosphere. |
| 3. | Plants produce glucose and oxygen on their own-to carry out respiration. | Animals get glucose and oxygen from outside to carry out respiration. |

**28.** Why do we feel pain or cramps in muscles after a vigorous exercise? [All India 2017]

**Ans :**

Actively metabolizing cells of an extremely active skeletal muscle, during heavy exercise, carry oxidation in the anaerobic condition inside the muscle cell, we feel pain after a vigorous exercise because of production of ATP by anaerobic respiration in leg muscles.

**29.** List two ways in which plants can get rid of the wastes.

**Ans :** [All India 2016]

They can throw gases and excess water through stomata through diffusion. They can store wastes like gums and resins in old xylem tissue (wood).

**30.** What is the role of acid and mucus in stomach?

**Ans :** [Delhi 2016]

It kills germs in food and provides acidic medium for the action of pepsin enzyme to digest the proteins in stomach.
Mucus protects the wall of stomach from the action of acid and pepsin.

**31.** Which digestive secretion does not contain any enzyme but is important? Discuss. [All India 2016]

**Ans :**

Bile juice from liver. It contains bile salts which are necessary for emulsification of fats. It means breaking down large fat drops to very fine droplets so that lipase can act upon them easily.

**32.** Differentiate between auricles and ventricles.

**Ans :** [CBSE 2016 C]

| | Auricle | Ventricle |
|---|---|---|
| 1. | Upper thin walled chambers. | Lower thick walled chambers. |
| 2. | Receive blood from veins. | Receive blood from the auricles |
| 3. | Push blood into the ventricles. | Push blood into the arteries. |

**33.** What is the role of valves in veins?

**Ans :** [Foreign 2016]

They prevent the back flow of blood especially when it moves against gravity and under low blood pressure.

**34.** How is the small intestine designed to absorb digested food? [All India 2016]

**Ans :**

Walls of small intestine has finger like projection called villi to increase surface area. The food is absorbed by villi and brought into blood. Fat is brought into lymph vessel.

**35.** Why are arteries thick walled and elastic?

**Ans :** [All India 2015]

Arteries receive the blood pumped by heart with lots of pressure hence to tolerate and sustain this pressure they are thick walled and elastic.

**36.** Differentiate between Artery and Veins.

**Ans :** [CBSE 2015 C]

Arteries carry blood away from the heart (arteriole: small arterial branch). They have thick and flexible walls to endure higher pressure of blood.

Veins transport blood toward the heart (venue: small vessel that carries blood from capillaries to veins). They have thinner wall but there are valves in them at regular distance to prevent back flow of blood especially when blood is returning back to heart from lower organs.

**37.** Differentiate between respiration and breathing.

**Ans :** [All India 2015]

| | Respiration | Breathing |
|---|---|---|
| 1. | It is a biochemical process. | It is a physical process. |
| 2. | $O_2$ reacts with food and energy is released. | Only exchange of gases. |
| 3. | Energy is released. | No energy released. |
| 4. | It occurs in cytoplasm and mitochondna. | Occur in respiratory organs. |

**38.** Write a balanced equation for photosynthesis.

**Ans :** [All India 2014]

$$6CO_2 + 12H_2O \xrightarrow[Chlorophyll]{Light} C_6H_{12}O_6 + 6H_2O + 6O_2$$

**39.** Name the enzyme present in Saliva? What is its role?

**Ans :** [All India 2014]

Salivary amylase enzyme present in saliva. It breaks down starch to sugar maltose.

**40.** How does nutrition take place in Amoeba? How is it different in Paramoecium? [All India 2014]

**Ans :**

**Nutrition in amoeba:** It occurs through phagocytosis. It capture food by pseudopodia (ingestion) ingested food, enclosed in cell membrane is called food vacuole. The food is broken with enzymes present in cytoplasm and undigested food 'is thrown out through cell membrane.
**Nutrition in Paramoecium:** 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 present on the entire surface of the cell.

**41.** Discuss how the roles of vena cava and pulmonary veins different from each other?

**Ans :** [Foreign 2014]

Pulmonary vein carries oxygenated blood from lungs to left auricle of heart in humans.

Vena Cava collects deoxygenated blood from all parts of the body and transport it to right auricle of the heart in human.

**42.** Why is it advisable to breathe through nose?

**Ans :** [CBSE 2014 C]

There are fine hair and mucus gland in the inner lining of nose which filter the incoming air of germs and dust. Moreover the air attains the optimum temperature before reaching the lungs.

**43.** Define transpiration. How does transpiration help in upward movement of water from roots to leaves? .

**Ans :** [All India 2014]

Transpiration is the process of removal of water vapours from the aerial parts of a plant, mainly through stomata in the leaves.

Evaporation of water molecules from the cells of a leaf creates a suction force which pulls water from the xylem cells. This transpiration helps in upward movement of water from roots to leaves.

**44.** Describe the structure of the human heart briefly.

**Ans :** [Sample Paper 2014-15]

Human heart is four chambered. The two upper chambers are called atria and they receive blood from large veins while the two lower chambers are called ventricles. Between left atrium and left ventricle as well as between right atrium and right ventricle are valve which allow blood to flow only from atrium to ventricle.

**45.** Name the respiratory pigment in human beings? What is its role? [All India 2013]

**Ans :**

Respiratory pigment, haemoglobin is present in red blood cells. Haemoglobin has affinity for O2 thus helping in its transport.

**46.** What are enzyme? Do they play some role in our digestive system too?

**Ans :** [CBSE 2013 C]

They are chemically proteinaceous biocatalyst, which increase or decrease the rate of a biochemical reaction.

The enzyme present in our digestive system help to breakdown of complex molecules of food into simpler ones.

**47.** What is the role of large intestine? [All India 2013]

**Ans :**

Water re-absorption occurs through villi, undigested food is stored in rectum and thrown out through anus. Exit is regulated by anal sphincter.

**48.** What are the outside raw materials used by an organisms?

**Ans :** [Delhi 2013]

Autotrophs can use simple inorganic molecules like water and carbon dioxide while complex organic molecule are used by heterotrophic organisms as proteins, fats and carbohydrates.

**49.** Why are ventricles thick walled and muscular?

**Ans :** [All India 2013]

Since ventricles have to pump blood into various organs, they are thick-walled and muscular.

**50.** How is the length of intestine related to food habit of the animal? [All India 2012]

**Ans :**

Intestine where digestion and absorption occur is very long in herbivores and shorter in carnivores as digesting meat is easier than digesting grass.

**51.** Differentiate between Photosynthesis and Respiration.

**Ans :** [All India 2011]

| | **Respiration** | **Photosynthesis** |
|---|---|---|
| 1. | It occurs in all living cells. | It occurs in only autotrophs. |
| 2. | $O_2$ reacts with food and energy is released. | $CO_2$ and $H_2O$ combine to form starch and water in the presence of light. |
| 3. | It occurs in cytoplasm and mitochondria. | Occur in plastid-chloroplast |

**52.** Differentiate between alveoli of lungs and nephrons of kidneys. [Sample Paper 2009]

**Ans :**

| | **Alveoli in the Lungs** | **Nephrons in the Kidneys** |
|---|---|---|
| 1. | Thin walled, sac like structure, surrounded with network of capillaries. | Thin walled, tubular structure, surrounded with network of capillaries. |
| 2. | Helps in exchange of gases between blood and outside air, that is, removal of CO2 and taking in of 09. | Helps in filtration of wastes like urea and uric acid from blood |
| 3. | Waste produced is C02 and water vapor (gaseous waste) | Waste produced is urine-salts, urea, uric acid etc. dissolved in water liquid waste |

**53.** What the components of transport system are in highly organize plants? [All India 2017]

or

**54.** What is the difference between Xylem and Phloem?

**Ans :** [Delhi 2009]

There are two conducting tissues in transport system

of plants, first is xylem and second is phloem.

| | Xylem | Phloem |
|---|---|---|
| 1. | Water and mineral from the roots to aerial parts of the plant. | Transportation of food and nutrients from leaves to growing parts of plant. This movement of substance is called translocation. |
| 2. | Its movement is unidirectional - moves up the plant's stem. | Its movement is bidirectional - moves up and down |
| 3. | Tracheids, vessels are the elements of xylem. | Sieve tubes, companion cells are the element of phloem. |

**55.** What is respiration? What is its importance for an organism.

**Ans :** [CBSE 2009 C]

The breakdown of food in cells to release energy. All kind of food is broken down through oxidation-reduction reaction and its chemical energy is converted into a universal source of chemical energy - ATP, Adenosine Tri Phosphate.

**56.** What is residual volume in our lungs? What is its importance? [All India 2011]

**Ans :**

Residual volume is the amount of air which is always left inside the lungs in spite of forceful exhalation. It helps in continuous gas exchange during exhalation or inhalation.

**57.** Show direction of flow of lymph with the help of flow diagram. [All India 2010]

**Ans :**

Lymph → tissue → sinus → lymph vessel → vein → heart.

**58.** What is the role of saliva in digestion of food?

**Ans :** [Delhi 2017]

Saliva lubricates and softens the food so that it can be easily chewed and swallowed. It contains enzyme amylase which breaks down starch to maltose.

**59.** Why rate of breathing in aquatic animals has to be faster than that in terrestrial animals?[CBSE 2008 C]

**Ans :**

Amount of O2 dissolved in water is less than O2 present in air therefore rate of breathing in aquatic animals has to be faster than that in terrestrial animals. Terrestrial organism need not spend so much energy to obtain oxygen.

**60.** What are the raw materials for photosynthesis. How are they obtained by a plant? [CBSE 2008 C]

**Ans :**

$CO_2$ and water are needed for the photosynthesis. $CO_2$ enters the leaf through stoma present on its surface. These pores open in day time in most of plants though in desert plants they open at night to reduce the loss of water. Water is absorbed by roots from the soil along with other materials like nitrogen, phosphorus, iron and magnesium.

**61.** How do autotrophs obtain $CO_2$ and $N_2$ to make their food?

**Ans :** [All India 2008]

$CO_2$ from environment/atmosphere through diffusion/ stomata. Nitrogen from soil/environment in inorganic (nitrates) or organic form.

**62.** Write one function each of the following components of the transport system in human beings
blood vessels
blood platelets
Lymph
Heart

**Ans :** [All India 2008]

a. Blood vessels: transport of blood.
b. Blood platelets: clotting of blood preventing its loss/leakage.
c. Lymph: carries digested fats/protects from infection/exchange of materials between tissues and blood/drains excessive fluid back to blood.
d. Heart: pumps blood to all parts.

## THREE MARKS QUESTIONS

**63.** What is sequence of steps in photosynthesis? How is it different in desert plants and those in temperate regions?

**Ans :** [All India 2018, Delhi 2017, Foreign 2015]

Chloroplast (chlorophyll), on exposure to light energy, becomes activated by absorbing light energy, and splits water (photolysis of water) to oxygen and hydrogen. Hydrogen reduces $CO_2$, and synthesizes glucose.

In plants of temperate regions, stomata open during day to take in $CO_2$ and release $O_2$.

Desert plants open stomata at night to check excessive loss of water hence sequence of steps of photosynthesis are slightly different.

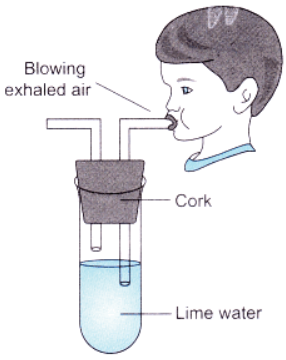
These plants take up carbon dioxide at night and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day.

**64.** Design an activity to show that $CO_2$ is produced during breathing. [Delhi 2017]

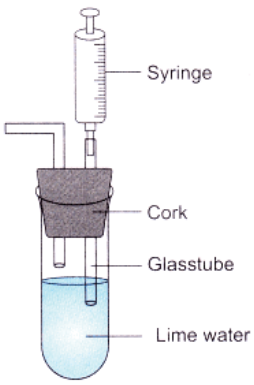
**Ans :**

Materials Required:
Two test tubes, a cork with two holes, two glass tubes bent at right angle, syringe, lime water $Ca(OH)_2$.
Procedure :
a. Take some freshly prepared lime water, Ca(OH)2 in two test tubes,
b. Fit cork with two holes in test tubes A and B.
c. Fix two glass tubes in this cork of test tube A as shown in the figure.
d. Exhale air into the tube and record your observations.

e. Pass air by the syringe through the lime water contained in test tube B and record your observations.




(A)
Air being exhaled into lime water




(B)
Air being passed into lime water with a syringe

Observation:
Lime water turns milky sooner in test tube A than in test tube B.
Conclusion
a. The exhaled air contains lot of CO2 which turns lime water milky.
b. This proves that CO2 gas is exhaled out by humans during respiration.

**65.** What is the composition of urine? Are glucose and proteins normally present in urine? Why? How is volume of urine regulated? [All India 2017]

**Ans :**

The urine contains mainly water, various salts, urea and uric acid. No, they are not present in urine as glucose is reabsorbed by nephron while protein are not filtered from blood in glomerulus in a healthy kidney. Volume of urine is regulated by
a. The amount of excess water.
b. The amount of dissolved waste in blood.

**66.** a. What is the role of mucus in stomach?
b. What are the two vital functions of human kidney?

**Ans :** [Foreign 2017]

a. To protect the stomach lining from the action of acid and pepsin.
b. The two vital functions of human kidney are:
(i) Excretion - Removal of toxic wastes like urea, uric acid.
(ii) Osmoregulation - The process of maintaining the right amount of water and proper ionic balance in body. It is done by controlling the amount of water and salts reabsorbed by nephron - tubules.

**67.** a. How is oxygen and carbon dioxide exchanged between blood and tissue? How are the gases transported in human being?
b. What is haemoglobin? [CBSE 2016-17]

**Ans :**

a. Exchange of gases in tissues occurs through diffusion. Oxygen is carried as oxyhaemoglobin from lungs to tissues. It dissociates and carbon dioxide diffuses out into blood from tissues. It is transported in dissolved form and reaches lungs where again it diffuses to alveoli.
b. Respiratory pigment: Haemoglobin is a red coloured protein present in red blood cells. Haemoglobin has affinity for $O_2$.

**68.** What are the important features of all respiratory structures in animals?

or

How are alveoli designed to maximize the exchange of gases? [Delhi 2016]

**Ans :**

All respiratory system have some important features.
a. Large surface area.
b. Thin and delicate surface for diffusion and exchange of gases. It is generally located in protected inner part of body.
c. Rich blood supply to respiratory organ. Since all of them are present in alveoli hence it is perfectly designed for exchange of gases.

**69.** What is excretion? Name some parts in our body involved in this life process? [Delhi 2016]

**Ans :**

Excretion means throwing out metabolic waste from living body. Many organs perform this process such as
a. Kidneys remove nitrogenous wastes like urea and uric acid in urine.
b. Sweat and oil by glands in skin.
c. Carbon dioxide and water vapor by lungs.
d. Faces or undigested food by large intestine.
e. Bile pigments by liver. It also converts toxic ammonia to urea.

**70.** What is the need to have a transport system in complex organisms? [CBSE 2013C]

**Ans :**

The transport system of an animal moves substances to where they are needed in the body. Even the smallest animal must have the means of transporting substances around its body. Oxygen and food molecules must move to all the cells, and the waste products must be removed from the cells and expelled into the environment. It occurs through diffusion mainly.

In a multicellular organism, all cells are not in contact with the surrounding hence diffusion will be insufficient for it. A variety of fluid systems, called vascular systems, help such transport in most members of the animal kingdom.

**71.** Explain how the air is inhaled during breathing in humans. [Delhi 2012]

**Ans :**

Mechanism of inhalation:

a. The diaphragm and rib muscles contract which make the throat move upwards and outwards.
b. The volume inside the thoracic cavity increases i.e., it expands.
c. Air pressure inside the thoracic cavity decreases. Thus, air from outside rushes into the lungs / alveoli through nostrils, trachea and bronchi.

**72.** How is food transported in a plant?

**Ans :** [Foreign 2011]

The food prepared by plant may be sucrose, amino acids or other materials. It is done with the help of living cells- sieve tubes and companion cell of phloem tissue by utilizing energy of ATP. The movement occurs both upwards and down ward from the place of formation (leaves) to storage organ (roots or stems) from storage organ to organ of its utilization (growing buds) depending upon the situation.

a. Translocation: Transport of organic food from the leaves to the other parts of the plants through the sieve tubes of phloem tissue is called translocation.
b. Importance: It is an essential process as every part of the plant requires food. For energy, building and maintenance.
c. Sugars are synthesized in the leaves whereas hormones are synthesized in the growing parts of roots and shoots.

**73.** What are the main events occurring in the small intestine?

**Ans :** [All India 2011]

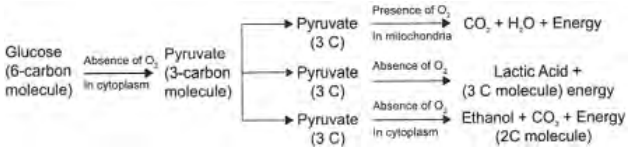
The main events occurring in the small intestine are as follows:

a. Bile emulsifies fat present in the food (emulsification means breaking of fat molecules into smaller globules).
b. Pancreatic juice containing trypsin for digesting proteins and pancreatic amylase for starch act upon the food.
c. Bicarbonate ions secreted by duodenal wall make the medium alkaline because it is required for the action of pancreatic enzynies.
d. Enzymes produced in intestinal juice complete the digestive process.
e. Digested food - amino acids, sugar are absorbed by the blood capillaries present in the villi of intestine.
f. Digested fats are absorbed by lymph vessels present in the villi of intestine.

**74.** Give schematic representation of different pathways of breakdown of glucose molecule.

**[All India 2010,2014,2016]**

**Ans :**




**75.** Which process in plants is responsible for clouds formation and precipitation? Define the process. How is this process important for the plants?

**Ans :** [All India 2010]

They are due to transpiration. Transpiration is evaporation of water from aerial parts, leaves of plant, through mainly stomata.

a. In plants, water rises because of transpiration and in nature water cycle operates because of it.
b. Transpiration is the process of cooling the parts of a plant.
c. Evaporation of water molecules from the cells of a leaf creates a suction force which pulls water from the xylem cells. This transpiration helps in upward movement of water from roots to leaves.

**76.** What is the fate of glucose molecule in

a. Anaerobic respiration in Yeast and lactobacillus bacteria?
b. Aerobic respiration in human cells.

Write chemical equation for each type.

or

What are the different ways in which glucose is oxidized to provide energy in various organisms?

**[All India 2010, 2013, 2015]**

**Ans :**

Pyruvate (3 carbon molecule) is formed by glucose (6 carbon molecule) through Glycolysis in all the organisms. Anaerobic Respiration: Anaerobic respiration in microbe such as yeast which is also known as fermentation produce end-products as follows:

$$\underset{\text{Glucose}}{C_6H_{12}O_6} \longrightarrow \text{Pyruvate} \xrightarrow{\text{Fermentation}} \underset{\text{Ethyl alcohol}}{2C_2H_5OH} + \underset{\text{Carbon dioxide}}{2CO_2} + \text{Energy}$$

Aerobic respiration:

The second step of respiration in human cell takes place in the presence of oxygen inside mitochondria and is, therefore, called aerobic (in air) respiration. During this stage, the end product of glycolysis, the 2 molecules of pyruvic acid enter the mitochondria of aerobic cells and undergo complete oxidation by enzymes in Krebs cycle into CO2 and H2O and release large amount of energy (30 ATP molecules). Thus, complete oxidation of one molecule of glucose

and aerobic respiration generates in total of 38 ATP molecules.

$$\text{Glucose} \longrightarrow \text{Pyruvate} \xrightarrow{\text{Presence of Oxygen}} \text{Carbon dioxide} + \text{Water} + \text{Energy}$$

**77.** Leaves of a healthy potted plant were coated with Vaseline to block the stomata. Will this plant remain healthy for long? Stage three reasons for your answer. [All India 2009]

**Ans :**

No, the plant will not stay healthy for a long time. The reasons are:

a. It will not be able to exchange $O_2$ and $CO_2$, hence respiration will be affected adversely.
b. Photosynthesis will also be affected as $CO_2$ will not be available.
c. Transpiration will not take place hence there will be no ascent of sap, hence no water absorption from the soil.

**78.** If a plant is kept covered with a polythene sheet, we notice some water drops on the inner side of the sheet after some time. What are they due to? Name and define the process. What is the significance of this process in plants and in nature? How does transpiration help in upward movement of water from roots to leaves? [Delhi 2015]

**Ans :**

If a plant is kept covered with a polythene sheet, we notice some water drops on the inner side of the sheet after sometime due to transpiration. The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration. This process helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves. It also helps in temperature regulation.

## FIVE MARKS QUESTIONS

**79.** How are water and minerals absorbed and transported in the plants? [All India 2009]

**Ans :**

1. Transpiration is the process of removal of water vapors from the aerial parts of a plant, mainly through stomata in the leaves.
2. There are two conducting tissues of plants: first is xylem and second is phloem. Tracheids and vessels which are two kinds of elements of xylem.
3. Tracheids are found in all vascular plants. They are spindle shaped, have only pits and are not very efficient.
4. Vessels are found in flowering plants, are tube like, have perforation plates and pits making them more efficient.
5. When loss of water in vapour occur from leaves of plants due to transpiration, deficit of water is created in the leaves. Evaporation of water molecules from the cells of a leaf creates a suction force which pulls water from the xylem cells.
6. Water and minerals dissolved in it move up to leaves from root through tracheids and vessels, pulling water and minerals upward through xylem elements-ascent of sap. Thus transpiration helps in upward movement of water from roots to leaves.
7. The roots of a plant absorb water and dissolved substances from the soil, which is needed by the aerial parts of the plants. As such these substances are to be transported from roots up to stem, leaves and flowers.

**80.** Describe the mechanism of gaseous exchange in tissues and lungs. [Delhi 2015]

or

How is oxygen and carbon dioxide transported in human being? [CBSE 2016]

or

How is oxygen and carbon dioxide transported in human being? Explain clearly how the air is inhaled and exhaled during breathing in humans.

**Ans :** [All India 2009]

Exchange of gases in tissues:

a. Most of oxygen is carried by haemoglobin in blood. On reaching the tissues, it gets diffused into the cells as it is in higher concentration than in the cells.
b. The carbon dioxide, which is formed in the cells, gets accumulated there in higher concentration as compared in the blood, now diffused into the blood.
c. The $CO_2$ mostly dissolved in blood plasma reaches the lungs, from where it is expelled out during exhalation.

Mechanism of Inhalation:

The thoracic cavity expands when diaphragm and rib muscles contract. The thorax moves upwards and outwards, increasing the volume inside thoracic cavity. The air pressure in the cavity decreases, hence the air rushes into the lungs through nostrils, trachea and bronchi.

Mechanism of Exhalation :

Exchange of gases between alveolar sacs and blood occurs and air having $CO_2$ enters the alveoli. The thoracic cavity comes back to its original size as diaphragm muscles relax. Air containing $CO_2$ is exhaled out through bronchi, trachea and nostrils.

**81.** What are the differences between Aerobic and Anaerobic respiration? Name some organisms which use the anaerobic mode of respiration.

**Ans :** [All India 2008]

| | Aerobic respiration | Anaerobic respiration |
|---|---|---|
| 1. | Presence of air required. | Presence of air not required |
| 2. | Occur in two steps: 1st Glycolysis in cytoplasm. 2nd in mitochondria. | Complete process occurs in cytoplasm. |
| 3. | Glucose completely oxidized to CO, and $H_2O$. | Glucose incompletely oxidized to either an organic acid or alcohol with $CO_2$. |
| 4. | Large amount of energy produced | Less energy produced |
| 5 | E.g., man, higher plants | E.g., yeast, lactobacillus |

**82.** a. Mention any two components of blood.
b. Trace the movement of oxygenated blood in the body.
c. Write the function of valves present in between atria and ventricles.
d. Write one structural difference between the composition of artery and veins. **[All India 2018]**

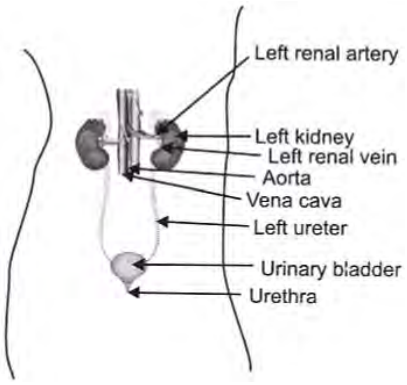
**Ans :**

a. plasma, blood cells.
b. Pulmonary vein from lungs → left atrium left ventricle → aorta → arteries to all organs.
c. Valves prevent backflow of blood from ventricles to atria when latter are contracting.
d. Arteries have thick, muscular and elastic walls. Veins have thinner, less muscular walls but have valves.

**83.** a. Define excretion.
b. Name the basic filtration unit present in the kidney.
c. Draw excretory system in human beings and label the following organs of excretory system which perform following functions:
(i) form urine
(ii) is a long tube which collects urine from kidney.
(iii) store urine until it is passed out.

**Ans :** [All India 2018]

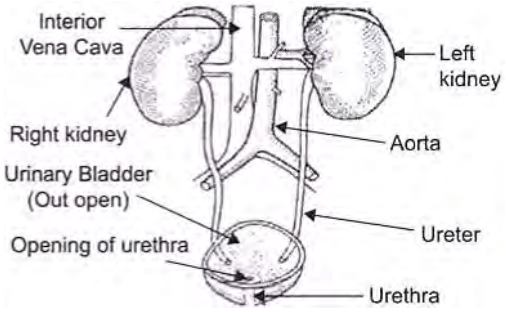
a. Throwing out wastes from the living body.
b. Nephron.
c. (i) kidney (ii) ureter (iii) urinary bladder




**84.** a. What are two vital functions of the human kidney?
b. Draw labelled diagram of human urinary system.

**Ans :** [Delhi 2017]

a. The two vital functions of kidney are —
1. Excretion of nitrogenous wastes.
2. Osmoregulation - regulation of water and salt content in blood.

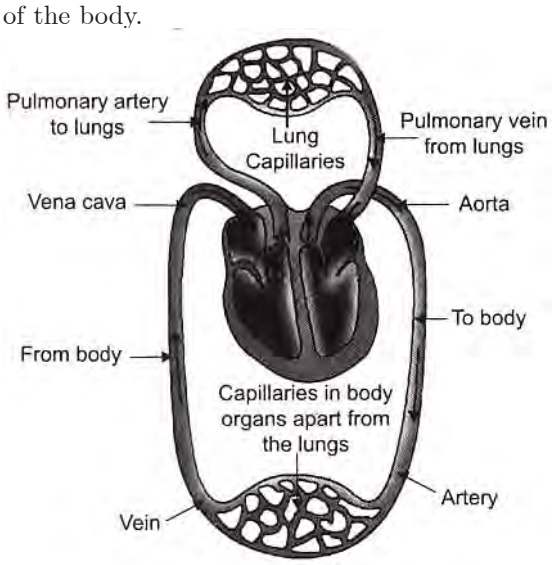



**85.** Describe double circulation in human beings. Name the group of animal with double circulation? How is it important for them?[Foreign 2017] [All India 2016-17]

**Ans :**

Such a flow in which blood enters the heart twice is called double circulation. It helps in keeping the oxygenated and deoxygenated blood separate.

The right atrium receives blood from the vena cava and pumps the blood into the right ventricle. Blood is sent to lungs, where it is oxygenated. Then, it is sent through the right and left pulmonary veins to the left atrium where it is pumped to the left ventricle. The blood then travels to the ascending aorta where it leaves the heart and delivers oxygen to different parts of the body.




Birds and mammals have double circulation because they need to maintain a constant body temperature (warm blooded animals or endotherms).

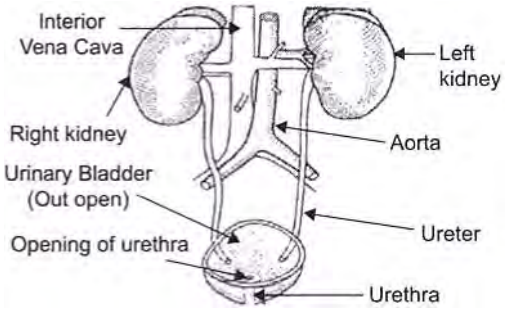
**86.** Where are kidneys located in our body? Show the location of different parts of urinary system in man. What is the importance of kidneys in our body?

**Ans :** [All India 2016]

The kidneys (renal glands) like high in the abdominal cavity near and on both sides of the vertebral column. The right kidney is slightly lower than the left to make room for the liver. Each kidney is bean shaped and the

concave portion faces medially. The kidney collects and transports urine from the kidney to ureters.
The kidneys regulate:

a. The volume of blood plasma (blood pressure).
b. The concentration of waste products in the blood (excretion).
c. The concentration of electrolytes such as $Na^+$, $K^+$, $HCO^{3-}$ and other ions (osmoregulation).
d. The pH of plasma.
e. Figure :




**87.** What are the different components of blood? Give the function of each of them. [Foreign 2015]

**Ans :**

Blood is a liquid connective tissue. It is chiefly formed of two components:

a. Fluid matrix or plasma: It is of pale colour and transports much substance like dissolved carbon dioxide, glucose, amino acids, urea etc. has mainly water, some proteins like albumin, fibrinogen (blood clotting protein) and many other substances to be transported.
b. Cellular elements which are of three types:
   (1) Red blood corpuscles (R.B.C) or erythrocyt. es, which transport $O_2$ and $CO_2$. They are enucleated, disc shaped, full of a red colored protein pigment, hemoglobin.
   (2) White blood corpuscles (W.B.C) or leucocytes, which fight disease-causing agent. They are larger, nucleated and are of different types.
   (3) Blood platelets or thrombocytes, which help in blood clotting. They are fragments of some larger cell hence do not have nucleus.

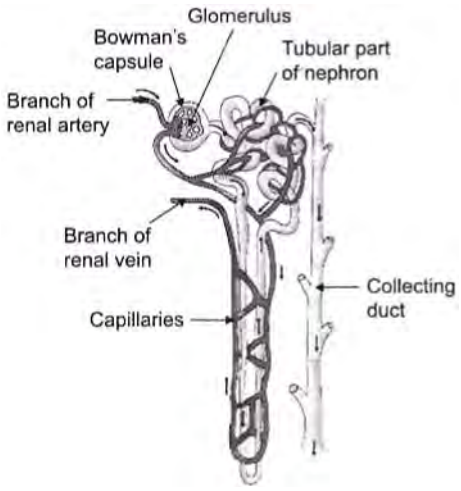
**88.** Draw neat and labeled diagram of nephron and describe the process of urine formation.

or

Describe structure and functioning of nephron.

**Ans :** [All India 2012]

Within the kidney are small functional units called nephrons, which are made up of glomeruli, Bowman's capsule, proximal convoluted tubule, loop of Henley1 s loop, distal convoluted loop, and collecting duct. Steps of urine formation: Each kidney is made of millions of nephron. Each nephron has a hollow cup like Bowman's capsule and a long tubule system following it. Arteriole branching from renal artery make bunches of capillaries, one of which is called a Glomerulus. The first step in the filtration process is when the blood enters the Glomerulus, where it is then pumped through the porous walls into the Bowman's space. This filtered plasma is mainly water, various salts, urea and glucose. The "glomerular filtrate" then passes through the proximal convoluted tubule , Loop of Henle, the distal convoluted tubule so that useful substances are re-absorbed by blood present in the capillaries around them.




The liquid is now called urine is concentrated and collected in collecting duct and poured in ureters to be carried to urinary bladder. Urine is passed out through urethra, when the urinary bladder is full and due to pressure there is an urge to do so. Sphincter muscles regulate this process

Osmoregulation and excretion are intimately related, these processes together maintain homeostasis (i.e. staying the same), and are performed by the same set of organs. The kidney is the major organ of osmoregulation and excretion in vertebrates.

**89.** Usman collected her saliva and mixed it with liquid A in the test tube. In another test tube she took only liquid A after about 10 minutes, she added a few drops of iodine solution to the mixture in the first test tube. It did not show any colour but when she treated the other test tube with iodine, a blue black colour appeared. Now answer the following questions:

a. What is the aim of this activity?
b. What is liquid A?
c. Why did the first test tube not show any colour change with iodine while the second one did?
d. Which enzyme is responsible for such a result?
e. Why does a piece of bread chewed for a long time tastes sweet?

**Ans :** [All India 2010]

a. To show the action of salivary amylase on starch.
b. Liquid A is starch.
c. The first test tube did not show any colour change with iodine because starch was not present anymore in it. It was already digested by salivary amylase present in saliva. The colour of liquid in the second one changed to blue black as the starch was still unchanged due to absence of the enzyme.
d. Salivary amylase enzyme is responsible for such a result.
e. A piece of bread chewed for a long time tastes sweet because the starch is broken down by salivary amylase to maltose sugar.

**90.** How are oxygen and $CO_2$ transported in human beings? How are lungs designed to maximise the area

for exchange of gases?

**Ans :** [All India 2008,2016-17]

Exchange of gases in tissues occurs through diffusion. Oxygen is carried as oxyhaemoglobin from lungs to tissues. It dissociates and carbon dioxide diffuses out into blood from tissues. It is transported in dissolved form and reaches lungs where again it diffuses to alveoli. Lungs have a tree like branching pattern of bronchi and bronchioles. The terminal part of bronchiole ends into sac like structures called alveoli which are present in groups. Alveoli have curved wall to increase surface area for exchange of gases. The wall of alveoli is extremely thin and is lined by blood capillaries.

**91.** (i) Explain the importance of the following:
(a) salivary amylase
(b) villi
(c) pepsin
(ii) Explain how oxygenated blood from this chamber is sent to all parts of the body.

**Ans :** [All India 2008]

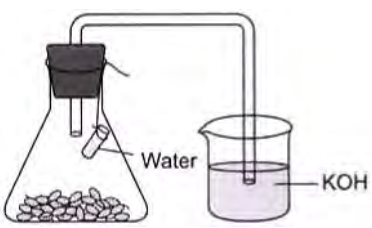
(i) (a) Salivary amylase: It's an enzyme present in the saliva, secreted by salivary glands. It digests starch into maltose there by starting the digestion of carbohydrate in the buccal cavity.
(b) Villi: They increase the surface area for absorption of digested food into the blood.
(c) Pepsin: It is a digestive enzyme secreted by gastric glands. It is responsible for the digestion of proteins in stomach.
(ii) When the left atrium contracts, the oxygenated blood is poured into the left ventricle. When the left ventricle contracts the blood is pumped into the aorta, the largest artery which distributes it to all the parts of the body through arteries.

**92.** In order to prepare a temporary mount of a leaf peel to observe stomata, which chemicals used for staining and mounting? [Delhi 2017]

**Ans :**

The chemicals used for staining and mounting respectively are safranin and glycerine.

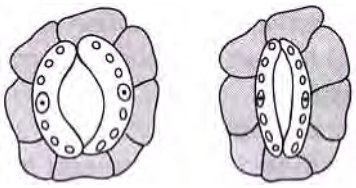
**93.** What are the possible observations in the given setup? **[Delhi 2017]**




**Ans :**

Nothing will happen to the level of water/ KOH as vacuum will not be created in the flask.

**94.** Name the gap formed between the kidney shaped cells in the given figure. What role do they play? What are the dot like structures present in these cells.



**Ans :** [Delhi 2017]

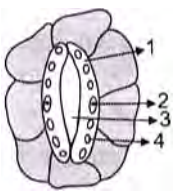
Stomata. Gas exchange and transpiration occur through the stomata. Dot like structures are called chloroplasts.

**95.** Name the chemical in small tube hanging in conical flask. Why is it being used?

**Ans :** [Delhi 2017]

Potassium hydroxide. It is used to absorb carbon dioxide released by germinating seeds during respiration.

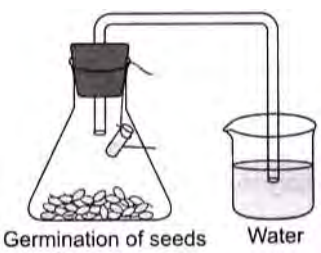
**96.** Identify structure 1-4 in the given figure:




**Ans :**

1. Guard cells 2. Vacuole 3. Stoma 4. Chloroplast.

**97.** A student set up apparatus as shown in figure. After 8 hours what is he likely to observe. Explain the reasons.




**Ans :**

a. Water would have risen in the tube as the oxygen present in the airtight flask would have been used up by germinating seeds for their respiration and CO2 gas which is being produced them must have been absorbed by KOH. As a result partial vacuum created will make water from beaker move up.
b. Water will rise initially while seeds are germinating but fall later.
c. Water.