



# Life's Internal Secrets

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- All plants and animals are living things. All living things have some common characteristics which makes them different from non-living things.
- The basic functions performed by living organisms to maintain their life are called life processes.
- Nutrition, respiration, transportation, excretion etc., are some of the life processes.
- The energy needed for life processes is derived from the food (nutrients). The process of intake of nutrients and its utilization by an organism is nutrition.
- In animals, the mode of nutrition is heterotrophic, the concerned organ is alimentary canal and the concerned glands are liver and pancreas.
- In plants two types of nutrition occurs : autotrophic and heterotrophic. In autotrophic nutrition, the organisms synthesize their own organic food while heterotrophic organisms depend on other organisms for their food.
- Autotrophic plants prepare their own food by the process photosynthesis in the presence of sunlight and chlorophyll using the raw materials  $\text{CO}_2$  and  $\text{H}_2\text{O}$ .
- The products of photosynthesis are oxygen and carbohydrates which are used in another life process called respiration.
- The process of release of energy from the assimilated food is called respiration. It has two distinct phases; breathing and cellular respiration.
- The two types of respiration in animals are; aerobic respiration and anaerobic respiration. The energy released during aerobic respiration is more than the energy released during anaerobic respiration.
- Alcohol,  $\text{CO}_2$  and energy are the products of anaerobic respiration whereas  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and energy are the products of aerobic respiration.
- Aerobic respiration takes place through lungs which have alveoli for exchange of gases.
- In plants respiration takes place through stomatal openings and the products are  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and energy which are used in the process photosynthesis.
- The process of transportation of materials in animals is called as circulation. Blood and lymph help in this process.
- Heart and blood vessels comprise the circulatory system. Heart beats rhythmically due to the contraction and relaxation of the atria and ventricles. Left atrium and right atrium contract together and relax together. Similarly left ventricle and right ventricle contract together and relax together.
- A circulatory system in which the blood travels twice through the heart during each cycle is called double circulation. e.g., human beings.
- Mammals and birds have four chambered heart. Amphibians and reptiles have three chambered heart. Fish has a two chambered heart.
- Lymph is another medium of circulation in the human body. It is a yellow liquid with similar composition to blood plasma. It flows only in one direction – from body tissues to the heart.

- In plants transportation occurs by means of root pressure and transpiration pull. It takes place through the conducting tissues xylem and phloem.
- The process of removal of toxic wastes from the body of our organism is called excretion.
- Kidneys are the main organs of excretion in human beings through which the nitrogenous metabolic wastes from the blood are eliminated in the form of urine.
- Each kidney is made up of a large number of excretory units called nephrons which filter the blood. The blood, free from waste materials is taken to the heart through the renal vein.
- Excretion in plants takes place: i) by shedding of leaves, flowers, fruits and bark. ii) by storage in plant cells and iii) by diffusion of gaseous wastes into air and soil around the roots.

## MULTIPLE CHOICE QUESTIONS (MCQ's)

*(Each question carries one mark)*

### MCQ's BASED ON PRACTICALS

**Experiment : I.** To prepare a temporary mount of a leaf peel to show stomata.

- To observe stomata in dicot leaf we must prepare a slide by taking :
 

(a) a crushed leaf	(b) upper epidermis of leaf
(c) a lower epidermis of leaf	(d) a central part of leaf
- When a student observed a stomatal epidermal peel of a leaf under microscope, it appeared pinkish red in colour. The stain used was :
 

(a) iodine	(b) acetocarmine	(c) safranin	(d) eosin
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- While preparing a temporary stained mount of leaf epidermal peel, the extra stain is removed by :
 

(a) washing with water	(b) washing with calcium chloride
(c) soaking with filter paper	(d) absorbing with cotton wool
- Rekha was shown slides of leaves. She can distinguish monocot and dicot leaf on the basis of :
 

(a) shape of stomata	(b) thickness of epidermis
(c) size of cells	(d) position of stomata
- Which of the following is the function of guard cells?
 

(a) transportation	(b) photosynthesis
(c) protection against mechanical injury	(d) control the opening and closing of stomata
- Generally more stomata are found in the :
 

(a) upper leaf surface	(b) lower leaf surface
(c) waxy cuticle	(d) mesophyll tissue
- In order to exchange gases with the atmosphere, epidermis of a leaf has minute openings called :
 

(a) lenticels	(b) guard cells	(c) cambium	(d) stomata
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8. The main gas that diffuses into the leaf at night is :  
(a)  $\text{CO}_2$                       (b)  $\text{O}_2$                       (c)  $\text{N}_2$                       (d)  $\text{H}_2\text{O}$
9. The main gas that diffuses out of the leaf at night is :  
(a)  $\text{CO}_2$                       (b)  $\text{N}_2$                       (c)  $\text{CO}$                       (d)  $\text{O}_2$
10. Loss of water through stomata in the form of water vapour is called :  
(a) evaporation                      (b) transportation                      (c) transpiration                      (d) condensation

**Experiment : II.** To show experimentally that light is necessary for photosynthesis.

1. Leaf is boiled in alcohol and kept in water bath because :  
(a) alcohol is bad for leaf                      (b) alcohol is volatile  
(c) alcohol catches fire on heating directly                      (d) alcohol leaves fumes
2. Which of the following is not essential for photosynthesis?  
(a) oxygen                      (b) carbon dioxide                      (c) light                      (d) chlorophyll
3. In an experiment to test the presence of starch in leaf, the leaf is boiled in alcohol for a few minutes using a water bath. This is an essential step in the experiment because alcohol:  
(a) softens the leaf                      (b) disallows the iodine to enter to leaf  
(c) allows iodine to enter the leaf                      (d) dissolves chlorophyll
4. A portion of each of four destarched leaves of a plant was covered with paper strips of various kinds. The plant was exposed to sunlight for five hours. Thereafter, the strips were removed and the leaves tested for starch in the covered portion. Which one out of the four leaves gave the starch test in the covered portion?  
(a) covered with black paper strip                      (b) covered with green paper strip  
(c) covered with white paper strip                      (d) covered with transparent paper strip
5. Ankita bought glucose powder. She felt it was adulterated with starch powder. How should she test it?  
(a) by sieving                      (b) by dissolving in water  
(c) by iodine test                      (d) all of these
6. Green plants synthesize their food during the process of :  
(a) respiration                      (b) transportation                      (c) nutrition                      (d) photosynthesis
7. Which of the following chemical is used to conduct starch test on leaves?  
(a) alcohol                      (b) iodine                      (c) potassium hydroxide                      (d) boiled water
8. Raw materials of photosynthesis are :  
(a)  $\text{CO}_2$  and  $\text{H}_2\text{O}$                       (b) sunlight and chlorophyll  
(c)  $\text{O}_2$  and  $\text{H}_2\text{O}$                       (d)  $\text{CO}_2$  and  $\text{O}_2$
9. The site of photosynthesis is :  
(a) mitochondria                      (b) chloroplasts                      (c) ribosomes                      (d) lysosomes

10. Which of the following processes does not occur during photosynthesis?
- (a) chloroplasts absorb radiant energy from sunlight
  - (b) water molecule is splitted into hydrogen and oxygen
  - (c) carbon dioxide is reduced to carbohydrate
  - (d) oxidation of carbon to carbon dioxide

**Experiment : III.** To show experimentally that carbon dioxide is given out during respiration.

1. Arrange the steps in correct order to demonstrate that  $\text{CO}_2$  is produced during respiration.
- i. Soak gram seeds overnight and place in a conical flask.
  - ii. Fit a cork and a U tube on the conical flask.
  - iii. Suspend a test tube containing KOH.
  - iv. Keep, the set up undisturbed.
- (a) i - ii - iii - iv      (b) i - ii - iv - iii      (c) i - iii - ii - iv      (d) i - iii - iv - ii
2. Fermentation is a type of :
- (a) aerobic respiration
  - (b) anaerobic respiration
  - (c) exothermic reaction
  - (d) none of these
3. Mohan prepared lime water and used it next month to show that  $\text{CO}_2$  is produced during respiration. What will be his observation?
- i. White ppt will be formed
  - ii. White ppt will not be formed
  - iii. Lime water should be fresh
  - iv. Lime water should be used any time
- (a) [ii] is correct      (b) [ii and iii] are correct
- (c) [i and iv] are correct      (d) [ii and iv] are correct
4. Before setting up an experiment to show that seeds release  $\text{CO}_2$  during respiration, the seeds should be.
- (a) dried completely
  - (b) boiled to make them soft
  - (c) soaked in vinegar
  - (d) kept moist till they germinate
5. Why is some KOH placed in a small test tube in the flask with germinating seeds in the experiment to demonstrate occurrence of respiration in germinating seeds?
- (a) to provide oxygen required by the seeds for respiration
  - (b) to absorb  $\text{CO}_2$  and create partial vacuum in the flask
  - (c) to absorb water from the seeds to make them dry.
  - (d) to make the air present in the flask alkaline.
6. Cellular respiration takes place in:
- (a) plastids
  - (b) mitochondria
  - (c) lysosomes
  - (d) ribosomes
7. Which of the following gas is given out during respiration?
- (a) oxygen
  - (b) carbon dioxide
  - (c) nitrogen
  - (d) hydrogen
8. The process of release of energy from the assimilated food is called :
- (a) nutrition
  - (b) transportation
  - (c) respiration
  - (d) excretion

**Experiment : IV.** To determine the percentage of water absorbed by raisins.

(Refer IX std. T.B - page no. 43)

- Percentage of water absorbed is calculated dividing ..... by initial weight.
  - final weight
  - increased weight
  - decreased weight
  - none of these
- A student dissolved one gm of sugar in 10 ml distilled water in beaker A. He dissolved 10gm of sugar in 100 ml of water in beaker B. Then he dropped few raisins in each beaker. After two hours he found raisins;
  - swollen in A and shrunken in B
  - shrunken in A and swollen in B
  - swollen in both
  - shrunken in both
- Twenty dry raisins were soaked in 50 ml of water and kept for 1 hour at 50°C. Which out of the following is the correct observation?
  - 8 raisins absorbed water and 12 didn't
  - 10 raisins absorbed water and 10 didn't
  - 15 raisins absorbed water and 5 didn't
  - All 20 raisins absorbed water
- The following data was obtained on performing an experiment of determining the percentage of water absorbed by raisins.
 

i. mass of water - 5 gms	ii. mass of dry raisins - 20 gms
iii. mass of soaked raisins - 30 gms	iv. mass of remaining water - 40 gms

 The percentage of water absorbed by raisins will be :
  - 10%
  - 25%
  - 50%
  - 45%
- A student soaked 5 gms of raisins in beaker A containing 25 ml of ice cold water and another 5 gms of raisins in beaker B containing 25 ml of tap water at room temperature. After one hour the student observed that :
  - the water absorbed by raisins in beaker A is more than the water absorbed by raisins in beaker B
  - the water absorbed by raisins in beaker B is more than the water absorbed by raisins in beaker A
  - a amount of water absorbed in both beakers is same
  - no water was absorbed in any beaker
- Dry raisins swell up when placed in water due to :
  - diffusion
  - imbibition
  - transpiration
  - endocytosis

### MCQ's BASED ON CHAPTER

#### Moderate Level

- Continuity of every species is maintained through :
  - nutrition
  - excretion
  - growth
  - reproduction
- Nutrition is the process of :
  - turning food to energy
  - taking food inside the body
  - taking and utilizing the food
  - removing waste matter

3. In which of the following life processes does the activity 'turning of food to energy' occurs?  
 (a) nutrition                      (b) respiration                      (c) transportation                      (d) growth
4. The life process which provides raw materials for maintenance of life is :  
 (a) respiration                      (b) circulation                      (c) excretion                      (d) nutrition
5. The act of taking food inside is :  
 (a) absorption                      (b) digestion                      (c) ingestion                      (d) assimilation
6. Complex organic food is converted into simpler soluble substances during :  
 (a) ingestion                      (b) digestion                      (c) absorption                      (d) egestion
7. Which is the largest gland in human body?  
 (a) liver                      (b) pancreas                      (c) gastric gland                      (d) gall bladder
8. Bile is stored in :  
 (a) bile duct                      (b) liver                      (c) pancreas                      (d) gall bladder
9. The human respiratory tract starts with :  
 (a) mouth                      (b) nostrils                      (c) larynx                      (d) pharynx
10. A human adult at rest, on an average breathes about :  
 (a) 20-32 times/min                      (b) 32-40 times/min                      (c) 12-20 times/min                      (d) 52-60 times/min
11. Which of the following organisms respire anaerobically?  
 (a) fish                      (b) earthworm                      (c) frog                      (d) roundworm
12. Human heart weighs about :  
 (a) 560 gms                      (b) 750 gms                      (c) 150 gms                      (d) 360 gms
13. In which of the following organisms the food material is broken down outside the body and then absorbed?  
 (a) yeast                      (b) human being                      (c) leeches                      (d) cuscuta
14. During respiration, the exchange of gases takes place in :  
 (a) trachea                      (b) diaphragm                      (c) alveoli                      (d) bronchi
15. Which of the following tissues in plants transport food and other substances in upward as well as downward direction?  
 (a) tracheids                      (b) xylem                      (c) phloem                      (d) xylem fibres
16. Haemodialysis is done in case of :  
 (a) heart failure                      (b) liver damage                      (c) kidney failure                      (d) brain damage
17. The blood vessels which carry impure blood back to the heart are :  
 (a) arteries                      (b) veins                      (c) capillaries                      (d) lymph vessels
18. Which blood vessel reach the cells and supply oxygen and other materials?  
 (a) arteries                      (b) veins                      (c) capillaries                      (d) lymph vessels
19. Which constituent of blood help in clotting the blood at the point of injury?  
 (a) RBCs                      (b) WBCs                      (c) plasma                      (d) platelets

**Elementary Level**

1. Which of the following action represents the life process sensitivity?  
 (a) respond and react                      (b) take food                      (c) able to move                      (d) grow to adult size



2. Which of the following is a body building nutrient?  
(a) carbohydrate      (b) fat      (c) protein      (d) mineral
3. Vitamins and minerals are :  
(a) body building nutrients      (b) energy giving nutrients  
(c) protective and regulating nutrients      (d) regulating nutrients
4. Which of the following are not organic nutrients?  
(a) carbohydrates      (b) proteins      (c) fats      (d) minerals
5. Which of the following process doesn't involve in nutrition?  
(a) digestion      (b) absorption      (c) assimilation      (d) inhalation
6. Which of the following are not autotrophs?  
(a) plants      (b) fungi      (c) algae      (d) trees
7. Parasitic mode of nutrition is seen in :  
(a) mucor      (b) cuscuta      (c) yeast      (d) mushroom
8. Which of the glands are not associated with alimentary canal?  
(a) liver      (b) pancreas      (c) thyroid      (d) gastric glands
9. In the mouth, enzyme salivary amylase breaks down starch into a simple sugar called :  
(a) lactose      (b) maltose      (c) glucose      (d) dextrose
10. Digestion of which constituent of food begins in the mouth itself?  
(a) carbohydrates      (b) proteins  
(c) fats      (d) vitamins and minerals
11. Small intestine gets its name from its:  
(a) smaller length      (b) smaller diameter      (c) longest size      (d) extensive coiling
12. Which of the following digestive enzyme is absent in pancreatic juice?  
(a) trypsin      (b) pepsin      (c) lipase      (d) amylase
13. Absorption of digested food takes place in the :  
(a) stomach      (b) small intestine      (c) large intestine      (d) liver
14. What is the function of villi?  
(a) digestion of carbohydrates      (b) digestion of proteins  
(c) absorption of digested food      (d) assimilation of absorbed food
15. In which part of the alimentary canal does the absorption of water and salts takes place?  
(a) small intestine      (b) large intestine      (c) oesophagus      (d) stomach
16. Which of the following is a fluid connective tissue in human beings?  
(a) ligaments      (b) tendons      (c) bone      (d) blood
17. Which of the following has a two-chambered heart?  
(a) frog      (b) tiger      (c) fish      (d) lizard
18. Which blood vessels bring purified blood from the lungs to the heart?  
(a) pulmonary artery      (b) aorta      (c) venacava      (d) pulmonary veins
19. Which of the following has a higher breathing rate?  
(a) dog      (b) man      (c) pigeon      (d) fish

**Complex Level**

1. Even though crystals grow in size during the process of crystallization, it is non-living because :  
(a) the growth is only for a definite period      (b) the growth is not from within the body  
(c) it doesn't have organ systems                      (d) its size doesn't change
2. Which constituent of food is difficult to digest?  
(a) carbohydrate    (b) proteins  
(c) fat    (d) vitamins and minerals
3. The inner lining of the stomach is protected from the action of acids by :  
(a) HCl    (b) pepsin    (c) amylase    (d) mucus
4. The air passage that takes air upto the respiratory organ in human beings is :  
(a) oesophagus    (b) nose    (c) trachea    (d) pharynx
5. Which of the following is produced during anaerobic respiration in human muscle cells?  
(a) CO<sub>2</sub>    (b) H<sub>2</sub>O    (c) ethanol    (d) lactic acid
6. Which of the following has the longest small intestine?  
(a) herbivore    (b) carnivore    (c) parasite    (d) saprophyte
7. In adult human beings, small intestine measures about :  
(a) 2 to 3 m    (b) 4 to 5 m    (c) 5 to 6 m    (d) 6 to 7 m
8. Which part of alimentary canal receives bile from the liver?  
(a) mouth    (b) stomach    (c) small intestine    (d) large intestine
9. Which enzyme is present in saliva as well as in pancreatic juice?  
(a) trypsin    (b) amylase    (c) lipase    (d) pepsin
10. In human beings, the process of digestion is completed in :  
(a) stomach    (b) large intestine    (c) small intestine    (d) kidneys
11. The function of pancreatic juice is to digest :  
(a) carbohydrates and proteins    (b) fats and proteins  
(c) carbohydrates, proteins and fats    (d) carbohydrates and fats
12. In human digestive system, bile is secreted by :  
(a) liver    (b) pancreas    (c) gall bladder    (d) stomach
13. The first enzyme to mix with food in the alimentary canal is :  
(a) trypsin    (b) lipase    (c) pepsin    (d) amylase
14. Which of the following is not produced during anaerobic respiration in yeast?  
(a) ethanol    (b) CO<sub>2</sub>    (c) ATP    (d) H<sub>2</sub>O
15. Aerobic respiration takes place in :  
(a) human muscles    (b) mitochondria    (c) golgi body    (d) ribosomes
16. During inhalation, air is passed in which of the following sequence?  
(a) nostrils → larynx → pharynx → trachea → alveoli  
(b) nostrils → trachea → alveoli → pharynx → larynx  
(c) nostrils → pharynx → larynx → trachea → alveoli  
(d) nostrils → trachea → pharynx → larynx → alveoli



**Mysterious Level**

- Which of the following is a correct statement?  
(a) bile makes the food acidic                      (b) food is partly digested in the small intestine  
(c) large intestine doesn't have any digestive function  
(d) small intestine is the shortest part of the alimentary canal
- The site of cellular respiration is :  
(a) chloroplasts                      (b) mitochondria                      (c) lysosomes                      (d) nucleus
- During cellular respiration, energy is released in the form of :  
(a) ATP                      (b) ADP                      (c) NADPH<sub>2</sub>                      (d) glucose
- The rate of breathing is faster in aquatic animals because :  
(a) they need large amount of oxygen                      (b) they are always in motion  
(c) solubility of oxygen in water is high  
(d) the amount of oxygen available in water is less
- Mammalian RBCs carry out only anaerobic respiration because :  
(a) they live in oxygen deficient environment                      (b) they do not require energy  
(c) chloroplasts are absent in them                      (d) mitochondria are absent in them
- The correct path taken by urine in our body is :  
(a) kidney → ureter → urinary bladder → urethra  
(b) kidney → renal artery → urethra → ureter  
(c) ureter → urethra → kidney → urinary bladder  
(d) renal artery → kidney → renal vein → ureter
- Which one of the following does not have any valves?  
(a) arteries                      (b) veins                      (c) capillaries                      (d) heart
- Largest amount of nitrogen is excreted from a human body through  
(a) faeces                      (b) sweat                      (c) urine                      (d) exhaled air
- The basic filtration unit in the kidney is :  
(a) renal vein                      (b) renal artery                      (c) neuron                      (d) nephron
- Which of the following process takes place by using the energy stored in ATP?  
(a) transpiration                      (b) translocation                      (c) inhalation                      (d) exhalation
- The blood which leaves the organs and flows towards the heart is rich in :  
(a) CO<sub>2</sub>                      (b) H<sub>2</sub>O                      (c) O<sub>2</sub>                      (d) H<sub>2</sub>
- Cramps in the legs during vigorous exercise is due to the conversion of pyruvate into :  
(a) ethyl alcohol                      (b) lactic acid                      (c) uric acid                      (d) acetic acid
- During inhalation :  
(a) diaphragm becomes convex, volume of thoracic cavity increases  
(b) diaphragm contracts, volume of thoracic cavity decreases  
(c) diaphragm relaxes, volume of thoracic cavity increases  
(d) diaphragm becomes concave, volume of thoracic cavity decreases
- Which of the following processes is not a method of excretion in plants  
(a) transpiration                      (b) shedding                      (c) storage                      (d) diffusion

*Answers***MCQ's BASED ON PRACTICAL SKILLS****Experiment : I**

1 - <b>c</b>	2 - <b>c</b>	3 - <b>c</b>	4 - <b>a</b>	5 - <b>d</b>
6 - <b>b</b>	7 - <b>d</b>	8 - <b>b</b>	9 - <b>a</b>	10 - <b>c</b>

**Experiment : II**

1 - <b>c</b>	2 - <b>a</b>	3 - <b>d</b>	4 - <b>d</b>	5 - <b>c</b>
6 - <b>d</b>	7 - <b>b</b>	8 - <b>a</b>	9 - <b>b</b>	10 - <b>d</b>

**Experiment : III**

1 - <b>c</b>	2 - <b>b</b>	3 - <b>b</b>	4 - <b>d</b>	5 - <b>b</b>
6 - <b>b</b>	7 - <b>b</b>	8 - <b>c</b>		

**Experiment : IV**

1 - <b>b</b>	2 - <b>d</b>	3 - <b>d</b>	4 - <b>c</b>	5 - <b>b</b>
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**MCQ's BASED ON CHAPTER****Moderate Level**

1 - <b>d</b>	2 - <b>c</b>	3 - <b>b</b>	4 - <b>d</b>	5 - <b>c</b>
6 - <b>b</b>	7 - <b>a</b>	8 - <b>d</b>	9 - <b>b</b>	10 - <b>c</b>
11 - <b>d</b>	12 - <b>d</b>	13 - <b>a</b>	14 - <b>c</b>	15 - <b>c</b>
16 - <b>c</b>	17 - <b>b</b>	18 - <b>c</b>	19 - <b>d</b>	

**Elementary Level**

1 - <b>a</b>	2 - <b>c</b>	3 - <b>c</b>	4 - <b>d</b>	5 - <b>d</b>
6 - <b>b</b>	7 - <b>b</b>	8 - <b>c</b>	9 - <b>b</b>	10 - <b>a</b>
11 - <b>b</b>	12 - <b>b</b>	13 - <b>b</b>	14 - <b>c</b>	15 - <b>b</b>
16 - <b>d</b>	17 - <b>c</b>	18 - <b>d</b>	19 - <b>d</b>	

**Complex Level**

1 - <b>b</b>	2 - <b>a</b>	3 - <b>d</b>	4 - <b>c</b>	5 - <b>d</b>
6 - <b>a</b>	7 - <b>c</b>	8 - <b>c</b>	9 - <b>b</b>	10 - <b>c</b>
11 - <b>c</b>	12 - <b>a</b>	13 - <b>d</b>	14 - <b>d</b>	15 - <b>b</b>
16 - <b>c</b>				

**Mysterious Level**

1 - <b>c</b>	2 - <b>b</b>	3 - <b>a</b>	4 - <b>d</b>	5 - <b>d</b>
6 - <b>a</b>	7 - <b>a</b>	8 - <b>c</b>	9 - <b>d</b>	10 - <b>b</b>
11 - <b>a</b>	12 - <b>b</b>	13 - <b>c</b>	14 - <b>a</b>	

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