Grade X - Science

Lesson 5. Life Processes

Objective Type Questions

(1 Mark each)

I. Multiple choice questions

1. The correct statement with references to single celled organisms are

   (i) Complex substances are not broken down into simpler substances.

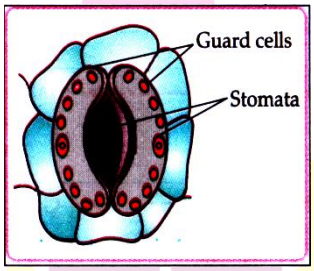
   (ii) Simple is sufficient to meet the requirement of exchange of gases.

   (iii) Specialised tissues perform different functions in the organism.

   (iv) Entire surface of the organism is in contact with the environment for taking in food.

   a. (i) and (iii) b. (ii) and (iii) **c. (ii) and (iv)** d. (i) and (iv)

2. Which one of the following conditions is true for the state of stomata of green leaf shown in the given diagram?



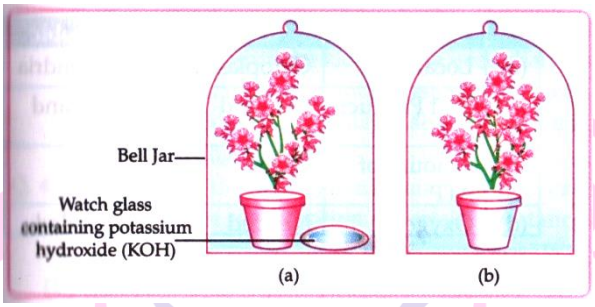
   a. Large amount of water flows into the guard cells.

   b. Gaseous exchange is occurring in large amount .

   c. Large amount of water flows out from the guard cells.

   d. Large amount of sugar collects in the guard cells.

3. A student was asked to write a step-wise procedure to demonstrate that carbon dioxide is necessary for photosynthesis. He wrote the following steps. The wrongly worded step is:



a. Both potted plants are kept in dark room for at least three days.

b. Bottom of the bell jars is sealed to make them air tight.

c. Both potted plants are kept in sunlight after the starch test.

d. A leaf from both the plants is taken to test the presence of starch.

4. The length of small intestine in a deer is more as compared to the length of small intestine of a tiger . The reason for this is

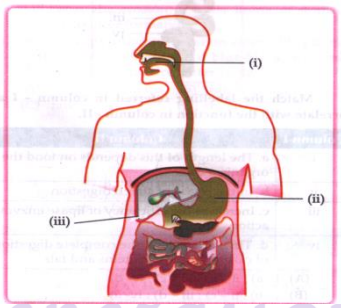
a. Mode if intake of food.

b. Type of food consumed.

c. Presence or absence of villi in intestines.

d. Presence of absence of digestive enzymes.

5. Identify the option that indicates the correct enzyme that is secreted in location i,ii and iii.



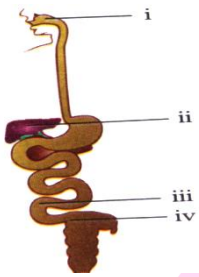
a. (i)-lipase,(ii)-trypsin, (iii)-pepsin

b. (i)-amylase, (ii)-pepsin, (iii)-trypsin

c. (i)-trypsin, (ii)-amylase, (iii)-carboxlase

d. (i)-permease, (ii)-carboxylase, (iii)-oxidase

6. Observe the diagram of Human digestive system.



Match the labelling referred in column – I and correlate with the function in column – II.

Column I	Column II
i	a. The length of this depends on food the organism eats.
ii	b. initial phase of starch digestion.
iii	c. Increases the efficiency of lipase enzyme action.
iv	d. This is the site of the complete digestion of carbohydrates, proteins and fats.

a. i.– a);ii – b);iii – c); iv – d)

b. i.– b);ii – c); iii – d); iv – a)

c. i.– b);ii – d); iii – c); iv – a)

d. i.– d); ii – a);iii – b); iv – c)

7. In which of the following groups of organisms food material is broken down outside the body and then absorbed in?

   a. mushroom, green plants, Amoeba

   b. yeast, mushroom, bread mould

   c. paramecium, Amoeba, cuscuta

   d. Cuscuta, lice, tapeworm

8. The liver secrets bile , needed to digest fats in our food. The pancreas secrets several enzymes needed to break down food.

   Which of the following is true of the food that we eat?

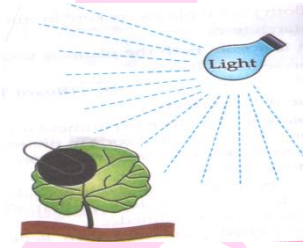
   a. It passes only through our liver.

   b. It passes only through our pancreas.

   c. It passes through both our liver and pancreas.

   d. It passes neither through our liver nor pancreas.

9. The diagram below sows a leaf that was covered by a piece of black paper for a period of 3 days .After 3 days the paper was removed. On testing it was found that the area under the black paper tested negative for starch and the rest tested positive for starch.



What was the experiment trying to test?

   a. If plants make their own food

   b. If light is required for plants to make food.

   c. It plants can respire in the absence of light.

   d. It plants can survive even in the absence of light.

10. Which of the following statement about the autotrophs is incorrect?

a. They synthesise carbohydrates from carbon dioxide and water in the presence of sunlight and chlorophyll.

b. They store carbohydrates in the form of starch.

c. They convert carbon di oxide and water into carbohydrates in the absence of sunlight .

d. They constitute the trophic level in food chain.

11. If salivary amylase is lacking in the saliva, which of the following events in the cavity will be affected?

a. proteins breaking down into amino acids.

b. starch breaking down into sugars

c. fats breaking down into fatty acids and alycerol

d. absorption of vitamins.

12. Select the correct statement.

a. Heterotrophs do not synthesise their own food.

b. Heterotrophs utilise solar energy for photosynthesis.

c. Heterotrophs synthesise their own food.

d. Heterotrophs are capable of converting carbon dioxide and water into carbohydrates.

13. The autotrophic mode of nutrition requires.

a. carbon dioxide and water. b. chlorophyll

c. sunlight **d. all of these**

14. The inner lining of stomach is protected by one of the following from hydrochloric acid . Choose the correct one.

a. Pepsin **b. Mucus** c. Salivary amylase d. Bile.

15. A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains.

a. complex proteins b. simple proteins c. fats **d. starch**

II. Multiple choice questions

1. In living Organisms during respiration which of the following products are NOT formed if oxygen is not available?

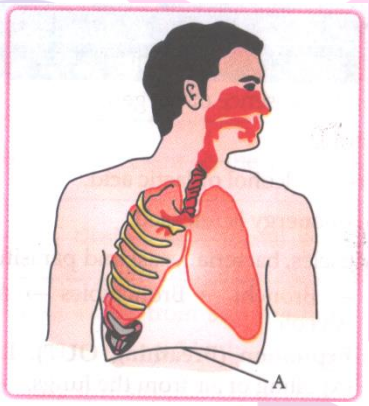
   a. Carbon dioxide + Water

   b. Carbo dioxide + Alcohol

   c. Lactic acid + Alcohol

   d. Carbon dioxide + Lactic Acid

2. Which of the following statements are correct in reference to the role of A (shown in the given diagram) during a breathing cycle in human beings?



(i) It helps to decrease the residual volume of air in lungs.

(ii) It flatten as we inhale

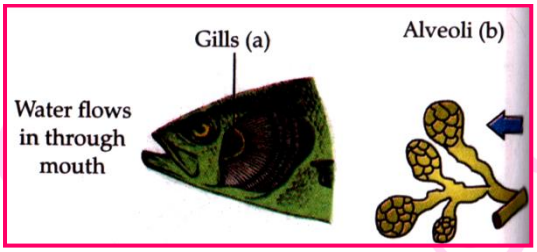
(iii) It gets raised as we inhale

(iv) It helps the chest cavity to become larger.

a. **(ii) and (iv)** b. (iii) and (iv)c.

c. (i) and (ii) d. (i),(ii) and (iv)

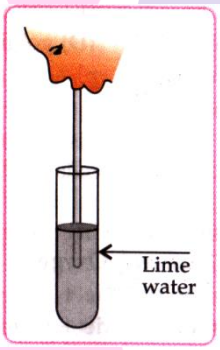
3. Respiratory structures of two different animal, a fish and human being are as shown.



Observe (a) and (b) and select one characteristic that holds true for both of them.

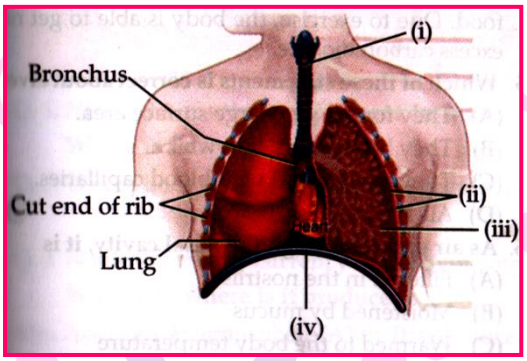
a. Both are placed internally in the body of animal
b. **Both have thin and moist surface for gaseous exchange.**
c. Both are poorly supplied with blood vessels to conserve energy.
d. In both, the blood returns to the heart after being oxygenated.

4. Observe the activity given below. What does it help to conclude, when the person exhales into the test-tube?



a. Percentage of carbon dioxide is more inhaled air.
b. Fermentation occurs in the presence of oxygen.
c. **Percentage of carbon dioxide is more in the exhaled air.**
d. Fermentation occurs in the presence of carbon dioxide.

5. Carefully study the diagram of the human respiratory system with labels i,ii,ii and iv . Select the option which gives correct identification and main function and /or characteristic.

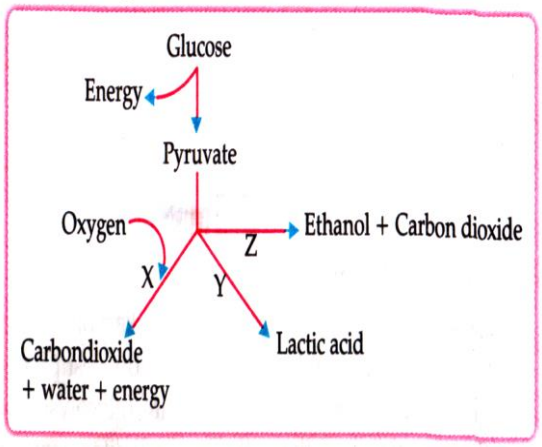


a. (i) Trachea: It is supported by bony rings for conducting inspired air.
b. (ii) Ribs: When we breathe out rib are lifted.
c. (iii) Alveoli: Thin –walled sac like structures for exchange of gases.
d. (iv) Diaphragm : It is pulled up when we breathe in.

6. Organisms break down large food molecules to small molecules. How does this breakdown help the organisms?

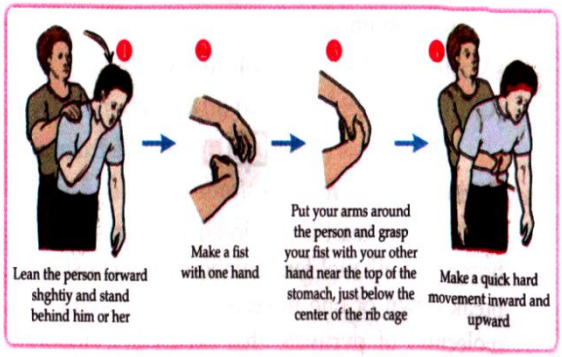
a. It releases a lot of energy in the digestive tract that can be used up by the cells.
b. It ensures that there are enough raw materials to produce and supply oxygen to the cells.
c. It converts the large molecules to small molecules that can pass through the cell membrane.
d. It makes sure that the liberation of heat by the breakdown of large molecules does not occur inside the cell.

7. Which of the following occurs during oxygen shortage in muscle cells?



a. Only x **b. Only y** c. Only z d. Any of them –x , y or z

8. A Person can choke when a piece of food becomes lodged in the windpipe, blocking the flow of air. A first aid procedure to remove the blockage is the Heimlich manoeuvre below:



By performing this procedure , the piece of food is pushed out of the windpipe . Which of the following causes this to happen?

a. The expansion of the chest
b. The air pressed out of the chest
c. The food pressed out of the stomach
d. The upward movement of the wall of the food pipe

9. The correct sequence of anaerobic reaction in yeast is

a. Glucose $\xrightarrow{\text{cytoplasm}}$ Pyruvate $\xrightarrow{\text{mitochondria}}$ Ethanol + Carbon dioxide
b. Glucose $\xrightarrow{\text{cytoplasm}}$ Pyruvate $\xrightarrow{\text{cytoplasm}}$ Lactic acid
c. Glucose $\xrightarrow{\text{cytoplasm}}$ Pyruvate $\xrightarrow{\text{mitochondria}}$ Lactic acid
d. Glucose $\xrightarrow{\text{cytoplasm}}$ Pyruvate $\xrightarrow{\text{cytoplasm}}$ Ethanol

10. Which of the following statements are correct?

(i) Pyruvate can be converted into ethanol and carbon dioxide by yeast.

(ii) Fermentation takes place in aerobic bacteria.

(iii) Fermentation takes place in mitochondria.

(iv) Fermentation is a form of anaerobic respiration.

a. (i) and (iii) b. (iii) and (iv) **c. (i) and (iv)** d. (ii) and (iii)

11. During deficiency of oxygen in tissues of human beings pyruvic acid is converted into lactic acid in the

a. **Cytoplasm** b. chloroplast c. mitochondria d. golgi body

12. Which of the following completes the given equation? Glucose + Oxygen (?)►

a. Only carbon dioxide + water + energy

b. Only carbon dioxide + water

c. Only carbon dioxide

d. Only water + energy

13. Which of the following take place after we exercise?

a. Our body needs more oxygen.

b. Our body needs to replace the energy used.

c. Our body needs to get rid of excess carbon dioxide.

d. All of these

14. As air passes through the nasal cavity, it is

a. Filtered in the nostrils

b. Moistened by mucus

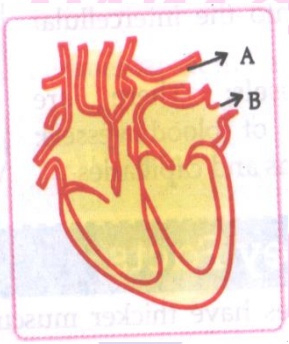
c. Warmed to the body temperature

d. All of these

III. Multiple choice questions

(1 Mark)

1. Consider the following statements in connection with the function of the blood vessels marked A and B in the in the diagram of a human heart as shown.



(i) Blood vessel A – It carries carbon dioxide rich blood to the lungs

(ii) Blood vessel B – It carries oxygen rich blood from the lungs.

(iii) Blood vessel B – Left atrium relaxes as it receives blood from the blood vessel.

(iv) Blood vessel A – Right atrium has thick muscular wall as it has to pump blood to the blood vessel.

The correct statement are

a. (i) and (ii) only

b. (ii) and (iii) only

b. (ii) , (iii) and (iv)

d. (i), (ii) and (iii)

2. Identify the two components of phloem tissue that help in transportation of food in plants.

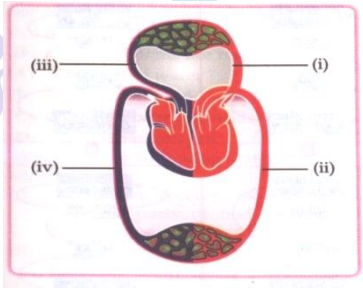
a. Phloem parenchyma & sieve tubes

b. Sieve tubes & companion cells.

c. Phloem parenchyma & companion cells.

d. Phloem fibre and sieve tubes

3. The figure given below shows a schematic plants of blood circulation in humans with labels (i) to (iv). Identify the correct label with its function?



a. (i) Pulmonary vein – takes impure blood from body part.

b. (ii) pulmonary artery –takes blood from lung to heat.

c. (iii) Aorta – takes blood from heart to body parts.

d. (iv) Vena cava takes – blood from body parts to right auricle.

4. Identify the phase of circulation which is represented in the diagram of heart given below. Arrows indicate contraction of the chambers shown.

a. Blood transferred to the right ventricle and left ventricle simultaneously.

b. Blood is transferred to lungs for oxygenation and is pumped into various organs simultaneously.

c. Blood transferred to the right auricle and left auricle simultaneously.

d. Blood is received from various organs of the body.

5. In which of the following groups of organisms, blood flows through the heart only once during one cycle of passage through the body?

a. Rabbit , Parrot , Turtle

b. Frog, crocodile, Pigeon

c. Whale, Labeo, Penguin

d. Shark, dog fish, sting ray

6. What is common between extensive network of blood vessels around walls of alveoli and in glomerulus of nephron?

a. Thick walled arteries richly supplied with blood

b. Thin walled veins poorly supplied with blood

c. Thick walled capillaries poorly supplied with blood

d. Thin walled capillaries richly supplied with blood

7. Which of the following plays the important role of creating a suction which pulls water upwards from the roots of a tree to its leaves?

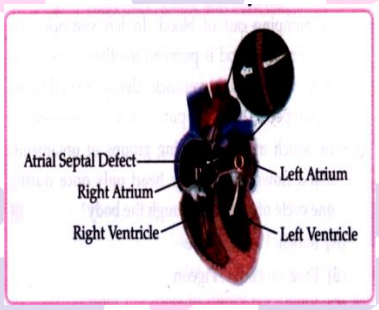
a. gravitation b. respiration

c. transpiration d. Photosynthesis

8. During transpiration, water is lost in the form of water vapour through_____.

a. xylem b. phloem **c. stomata** d. root hair

9. Some adults have a defective heart since birth. They are born with a hole between the left atrium and right atrium (shown below), this defect is called the Atrial septal Defect(ASD). Due to the hole between the atria , oxygenated blood gets mixed with deoxygenated blood. A symptom of this disease is to feel tired easily.



Which of the following is likely to happen in people with ASD in a single cycle of blood flow?

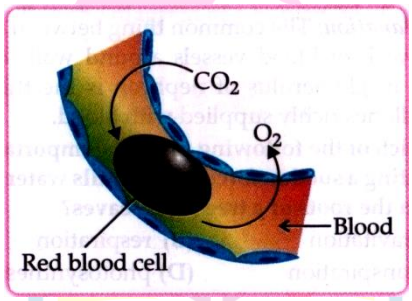
a. The kidneys will filter out more carbon oxide

b. The blood will take up more oxygen from the lungs.

c. The muscles will received blood containing less oxygen.

d. The lungs will receive blood containing more carbon dioxide.

10. Given below is a diagrammatic representation of a process taking place in the human body.



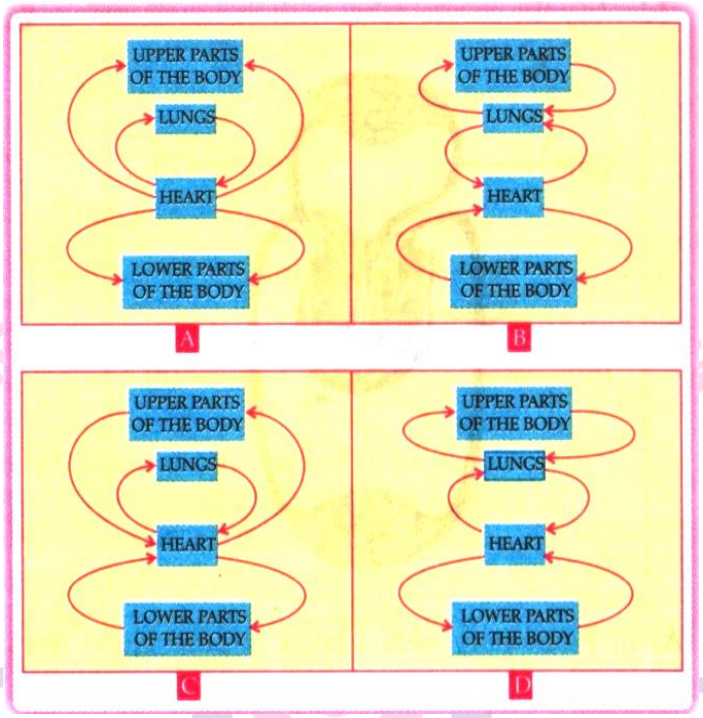
In which of these regions/organs could it be occurring?

(i) Lungs (ii) Heart (iii) Brain

a. Only in (i) b. only in (ii)

b. c. only in (i) and (ii) **d. in all – (i), (ii) and (iii)**

11. Which of these flowcharts correctly shows the circulation of blood in the human body?



Ans. Option (C) is correct.

12. Single circulation, i.e., blood flows through the heart only once during one cycle of passage through the body, is exhibited by

a. Labeo, chameleon, salamander

b. Hippocampus, Exocoetus, Anabas

c. Hyla, Rana, Draco

d. Whale, Dolphin, Turtle

13. The blood leaving the tissues becomes richer in

a. carbon dioxide b. water c. haemoglobin d. Oxygen

14. Which of the following statement(s) is (are) true about heart?

(i) Left atrium receives oxygenated blood from different parts of body while right atrium receives deoxygenated blood from lungs.

(ii) Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs.

(iii) Left atrium transfers oxygenated blood to right ventricle which sends it to different body parts.

(iv) Right atrium receives deoxygenated blood from different parts of the body while left ventricle pumps oxygenated blood to different parts of the body

a. (i) b. (ii) **c. (ii) and (iv)** d. (i) and (iii)

IV. Multiple choice questions

1. Which one among the following is not removed as a waste product from the body of a plant?

   b. Resins and Gums **b. Urea** c. Dry Leaves d. Excess water

2. Plants use completely different process for excretion as compared to animals . Which one of the following processes is NOT followed by plants for excretion?

   a. They can get rid of excess water by transpiration.

   b. They selectively filter toxic substances through their leaves.

   c. Waste products are stored as resins and gums in old xylem.

   d. They excrete waste substances into the soil around them.

3. In a person, the tubule part of the nephron is not functioning at all. What will its effect be on urine formations?

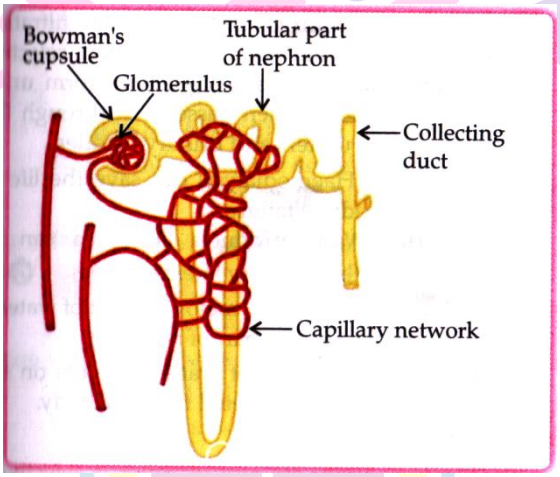
   a. The urine will not be formed.

   b. Quality and Quantity of urine is unaffected.

   c. Urine is more concentrated.

   d. Urine is more diluted

4. Observe the image of single nephron.



The amount of liquid passing in the form of glomerular filtrate is approximately 150-180 litres per day whereas the amount of urine flowing out of all the nephrons is only 1.5 to 1.8 litres per day. Water is getting re-absorbed.

a. in the Bowman's cup **b. in the long tubular part**

c. in the collecting duct d. in the glomerulus

5. The filtration units of kidneys are called

   a. ureter b. urethra c,.neurons **d. nephrons**

6. The kidneys in human beings are a part of the system for

a. nutrition b. respiration **c. excretion** d. transportation

7. Match the words of column (A) with that of column (B)

S. No	Column (A)		Column (B)
A	Phloem	(i)	Excretion
B	Nephron	(ii)	Translocation of food
C	Veins	(iii)	Clotting of blood
D	Platelets	(iv)	Deoxygenated blood

a. A-(ii), B – (i), C-(iv), D-(iii)

b. A – (iii), B – (iii), C – (i), D –(iv)

c. A – (i), B – (iv), C-(iii),D – (iv)

d. A- (i), B – (iv), C – (iii) , D – (iv)

8. Choose the correct path of urine in our body:

a. Kidney → ureter → urethra → urinary bladder

b. kidney → urinary → urinary → ureter

c. **kidney → ureters → urinary bladder → urethra**

d. kidney → ureters → urinary bladder → urethra

9. Which of the following substance are removed from blood in the kidney?

a. Water **b. Urea** c. Sodium e. Ammonia

10. Each nephron has a cup shaped upper end called_____ which contain a _____.

a. Bowman's capsule , Ampulla

b. Capillaries , Bowman's capsule

c. Ampulla, Glomerulus

d. Bowman's capsule, Glomerulus

11. Which of the following is used artificially to remove nitrogenous waste products from the blood?

a. Ventilator b. Transfusion **c. Haemodialysis** d. Angiogram

V. Multiple choice questions

1. Autotrophic organism include

a. bacteria and virus
b. bacteria and fungi
c. green plants and some bacteria
d. green plants and all bacteria

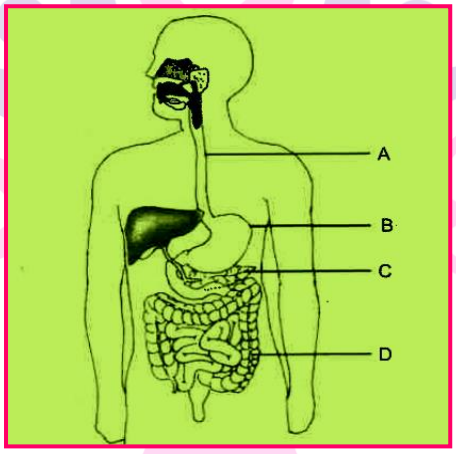
2. A gland not associated with alimentary canal is

a. liver
b. Salivary glands
c. Pancreas
d. Adrenal

3. Which of the following are chiefly digested in the stomach?

a. Carbohydrates
b. Proteins
c. Lipids
d. Fats

4. From the given picture of the digestive system, identify the part labelled as gastric gland.



a. A **b. B** c. C d. D

5. large intestine in man mainly carried out

a. Absorption
b. Assimilation
c. digestion of fats
d. digestion of carbohydrates

6. The part of the digestive system where no digestion takes place is

a. ileum b. stomach c. mouth **d. oesophagus**

7. The fermentation of glucose by yeast normally yields.

a. alcohol, CO_2, H_2O and 36 ATP
b. CO_2, H_2O and 36 ATP
c. alcohol, CO_2 and 2 ATP
d. lactic acid, CO_2 and 2 ATP

8. A large quantity of one of the following is removed from our body by lungs:

a. CO_2 and H_2O b. CO_2 only

c. H_2O only d. ammonia

9. In respiration, air passes through

a. Pharynx → nasal cavity → larynx → trachea → bronchi → bronchioles

b. Nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles

c. Larynx → nasal cavity → pharynx → trachea

d. Larynx → Pharynx → trachea → lungs.

10. A biochemical compound that readily combines with oxygen and distributes it throughout the human body is

a. water b. urea **c. haemoglobin** d. acetylcholine

11. The process in which loss of water takes place in the form of water vapour through stomata is called

a. transportation **b. transpiration**

c. guttation d. translocation

12. In a closed circulatory system, blood is completely enclosed within

a. vessels **a. heart**

c. skeleton d. sinuses

13. Normal blood pressure (Systolic/ diastolic) is

a. 120/80 mm of Hg b. 160/80 mm of Hg

c. 120/60 mm of Hg d. 120/60 mm of Hg

14. Blood pressure is measured by an instrument called

a. barometer **b. sphygmomanometer**

c. photometer d. manometer

15. Which of the following statements is not correct?

A. Deoxygenated blood is poured into right atrium of heart.

b. The excretory unit of flatworms are flame cells.

c. Human kidney has about 1 million nephridia.

d. Tracheids and vessels are non-living conducting tissues.

16. Which part of alimentary canal receives bile from the liver?

a. stomach

b. small intestine

c. large intestine

d. oesophagus

17. When air is blown from mouth into a test- tube containing lime water, the lime water turns milky due to the presence of

a. oxygen

b. urethra

b. neurons

d. nephrons

18. The filtration of kidneys are called

a. ureter

b. urethra

c. neurons

d. nephrons

19. Oxygen liberated during photosynthesis comes from

a. water

b. chlorophyll

c. carbon dioxide

d. glucose

20. The opening and closing of the stomatal pore depends upon

a. oxygen

b. temperature

c. water in guard cells

e. concentration of CO_2 in stomata

B Assertion & Reason - I

Direction : In the following questions , a statement of Assertion (A) of followed by a statement of Reason (R). Mark the correct choice as:

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is NOT the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is true.

1. **Assertion (A)** : Resins and gums are stored in old xylem tissue in plants.
   Reason (R) : Resins and gums facilitate transport of water molecules.
   Ans. Option (C) is correct.
2. Assertion (A) : Human body produces highly toxic substances, which if not eliminated may causes the death.
   Reason (R) : Excretory substances remove nitrogenous waste from the body.
   Ans. Option (B) is correct.
3. Assertion (A) : Excretory unit of kidneys are nephrons.
   Reason (R) : It has no role in secretion of urine.
   Ans. Option (B) is correct.
4. Assertion (A) : In humans, major amount of water is absorbed by the tubular part of nephron.
   Reason (R) : Absorption of water depends on the dissolved waste to be excrete from the body.
   Ans. Option (B) is correct.

B. Assertion & Reason -II

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as;

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true but R is Not the correct explanation of A.

C. A is true but R is false.

D. A is false and R is true.

1. **Assertion (A)** : The muscular walls of ventricles are thicker than auricles.

   Reason (R) : This help in preventing the back flow of blood.

   Ans. Option (C) is correct.

2. Assertion (A) : Valves are present in the arteries .

   Reason (R) : Arteries carry oxygenated blood from heart to different body parts except pulmonary artery.

   Ans. Option (D) is correct.

3. **Assertion (A)** : Plants have low energy needs.

   Reason (R) : Plant bodies have large proportion of dead cells.

   Ans. Option (A) is correct.

B Assertion & Reason - III

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason(R). Mark the correct choice as:

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is NOT the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is true.

1. **Assertion (A)** : The rate of breathing in aquatic organisms is much faster than in terrestrial organisms.

   Reason (R) : The amount of oxygen dissolved in water is much lower than the amount

   Ans. Option (A) is correct.

2. **Assertion (A)** : Energy is used during the process of respiration.

Reason (R) : Respiration stores energy in the form of ATP.

Ans. Option (D) is correction

3. **Assertion (A)** : Humans are not truly aerobic.

Reason (R) : They produce lactic anaerobically.

Ans. Option (B) is correct.

4. **Assertion (A)** : In human there is a complex respiration system.

Reason (R) : Human skin is impermeable to gases.

Ans. Option (B) is correct.

B Assertion & Reason - IV

Directions : In the following questions , a statement of Assertion (A) is followed by a statement of Reason(R).Mark the correct choice as:

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is Not the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is true.

1. **Assertion (A)** : Nitrogen is an essential element for plant growth and is taken up by plants growth and is taken up plants in the form or inorganic nitrates or nitrites.

Reason (R) : The soil is the nearest and richest source of raw materials like Nitrogen , phosphorus and other minerals for the plants.

Ans: option (B) is correct.

2. **Assertion (A)** : Hydrochloric acid helps in the digestion of food in the stomach.

Reason (R) : Hydrochloric acid creates an acidic medium to activate protein digesting enzymes.

Option (A) is correct.

3. **Assertion (A)** : HCl converts pepsinogen into active enzyme pepsin.

Reason (R) : Pepsin converts protein into proteose and peptone.

Ans. Option (B) is correct.

4. **Assertion (A)** : Digestion breaks large complex molecules to simple smaller molecules

which can be easily absorbed.

Reason (R) : Digestion is necessary for the absorption of all molecules.

5. **Assertion(A)** : Lipase hydrolyses fats and oils.

Reason (R) : Lipase hydrolyses fats and oils.

Ans: Option(D) is correct.

6. **Assertion (A)** : Photosynthesis is an anabolic process.

Reason (R) : The process of photosynthesis occurs in cholorophyll.

Ans. Option (C) is correct.

B Assertion & Reason - IV

Directions : In the following questions , a statement of Assertion (A) is followed by a statement of Reason(R).Mark the correct choice as:

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is Not the correct explanation of A.

(C) A is true but R is false.

(D) A is false and R is true.

1. **Assertion** : When air is passes through lime water, lime water turns milky.

Reason : Air contains 78% nitrogen and 21% oxygen

Ans .option (B) is Correct.

2. **Assertion** : Veins have thin walls to collect blood from different organs.

Reason : Blood in veins are not under pressure.

Ans. Option (A) is correct.

3. **Assertion** : Human being has a complex respiratory system.

Reason : Human skin is impermeable to gases.

Ans. Option (B) is correct

4. **Assertion** : All proteins in our food are digested in small intestine only.

Reason : The protein digesting enzymes are released onto small intestine.

Ans. Option (D) is correct.

5. Assertion : Human heart does not allow mixing of oxygen reach blood with carbon dioxide reach blood.

Reason : Human heart has different chambers.

Ans. (A) is correct.

Fill in the blanks

1. The _____ is where the respiratory and digestive passage come together.

Ans. Pharynx.

2. The condition necessary for photosynthesis to take places are ___ , ___, _____ and ___ .

Ans. Sunlight, chlorophyll, carbon dioxide and water

3. The process in which the digested food passes through the intestinal wall into blood stream is called _____.

Ans. Absorption

4. The teeth covered with a sticky, yellowish layer of food particles and bacteria is called _____

Ans. Plaque.

5. Iodine turns blue – black on reacting with _____.

Ans. Starch

6. The energy produced during respiration is stored in the form ATP which stand for ____.

Ans. Adenosine Tri-phosphate.

7. Pyruric acid is a three carbon compound which is also known as _____

Ans. Pyruvate

8. The rate of breathing in _____ animals in much faster than in _____ animals

Ans. Aquatic , terriestial

9. The actual exchange of gases takes places in the _____ of the lungs.

Ans. Alveoli

10. __ are long, thin, spindle shaped cell with pits in their thick cell walls.

Ans. Tracheids

11. The liquid part of blood is called _____

Ans. Plasma.

12. The expansion of an artery each time the blood is forced into it, is called _____.

Ans. Pulse

13. Gums and resins are the ____ products of plants.

Ans. Waste.

Match the following

1.

Column I	Column II
Animal	Respiratory Organ
(i) Fish	(A) Trachea
(ii) Birds	(B) Gills
(iii) Aquatic Arthropoda	(C) Lungs
(iv) Earthworm	(D) Moist

Ans. (i) (B), (ii) (C), (iii) (A), (iv) (D)

2.

Column I	Column II
Region of digestive system	Digestive juice
(A) Mouth (B) Stomach (C) Duodenum (D) Small intestine	(i) pancreatic juice (ii) Intestinal juice (iii) Gastric juice (iv) Saliva

Ans. (A) (iv), (B) (iii) , (C) (i), (D) (ii)

True or False

1. Glomerulus acts as a dialysis bag

Ans. True.

2. Bowman's capsule is found in heart.

Ans. False

3. Peristaltic movement of muscles occurs in the mouth to push food into alimentary canal

Ans. False

4. The release of energy in aerobic process is less than in anaerobic process.

Ans. False

5. Before testing for starch chlorophyll has to be removed from the leaf as it interferes in the test for starch due to its green colour.

Ans. True.

6. The process in which the absorbed food is taken in by body cells and used for energy, growth and repair is called egestion.

Ans. False

7. The length of small intestine in a human adult is about 3.5 m.

Ans. False.

8. Carbohydrates are the components of our food which is digested by an enzyme which is present in saliva as well as in pancreatic juice.

Ans. False.

9. Cytoplasm are the sites of aerobic respiration in the cells.

Ans. False.

10. The respiration in plants occurs at a fast rate where as the respiration in animals occurs at a much slower rate.

Ans. False.

Very short Answer Type Questions

(1 mark each)

1. **How is the wall of small intestine adapted for performing the function of absorption of food?**

   Ans. The inner of the small intestine has numerous finger-like projections called villi increase the surface area for absorption.

   Out of a goat and a tiger, which one will have a longer small intestine? Justify your answer.

   Ans. Goat, because harbivores eating grass need a longer small intestine to allow the cellulose to be digested.

2. **Name a common nutrient that is absorbed in the small intestine and reabsorbed by the kidney tubules.**

   Ans. Glucose/Amino acid.

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

   Ans. Saliva moistens the ingested food with mucus, sterilises it with lyzosome and partially digests starch part of food into sugar with the help of salivary amylase or ptyalin

4. **Name the energy currency in the living organisms . when and where is it produced?**

   Ans. Adenosine triphosphate (ATP). It is produced during respiration in living organisms in mitochondria.

5. **Veins are thin walled and have valves . Justify.**

   Ans. Veins have thin walls because the blood is no longer under pressure and they have valves to ensure blood flow in one direction.

6. **Name the tissues which (i) transport soluble products of photosynthesis in plants, (ii) transport water and minerals in a plant.**

Ans. (i) Phloem (ii) Xylem

7. **How is the amount of urine produced regulated?**

Ans. The amount of urine produced depends on the amount of excess water and dissolved wasted present in the body . Some other factors such as habitat of an organism and hormone such as Antidiuretic hormone (ADH) also regulates the amount of urine produced.

8. **What do you mean by life processes?**

Ans. Process which perform maintenance job in our body.

9. **Name the activity of living beings which considered as indication of life?**

Ans. Movement.

10. **Name the basic requirement of living organisms needed to obtain energy.**

Ans. Food.

11. **Name the process by which plants prepare food.**

Ans. Photosynthesis

12. **Mention the raw materials required for photosynthesis**

Ans. The raw materials required for photosynthesis are carbon dioxide and water in presence of sunlight and chlorophyll.

13. **Name four nutrients needed by the plants which are taken up from the soil.**

Ans. Nitrogen, phosphorus, iron and magnesium.

14. **Name the cell organelle in which photosynthesis occur.**

Ans. Chlorophyll.

15. **What is artificial kidney?**

Ans. It is a device to remove the nitrogenous waste products from the blood of a person with damaged kidneys with the process of dialysis.

16. **In the experiment "Light is essential for photosynthesis", why does the uncovered part of the leaf turn blue-black after putting iodine solution?**

Ans. Starch is produced in the uncovered part of the leaf due to photosynthesis which turns blue – black in presence of iodine solution.

17. **Name a unicellular organism which uses cilia to move food particles into its mouth.**

Ans. Paramecium.

18. Mention how organisms like bread moulds and mushrooms obtain their food.

Ans. Organisms like bread moulds and mushrooms breakdown the food materials outside the body and then absorb it.

19. Classify the following as saprotrophs parasites: leech, yeast, mushroom

Ans. Saprotrophs: yeast, mushroom parasites: leech

20. Which enzyme present in saliva breaks down starch?

Ans. The saliva contains an enzyme called salivary amylase that breaks starch.

21. Why does our mouth 'water' when we see or eat a food which we really like?

Ans. Due to the production of saliva by the salivary glands in the mouth.

22. Why does bread taste sweet on mastication?

Ans. Salivary amylase act on starch of food and change it into a sweet sugar called maltose.

23. Which pancreatic enzyme which is effective in digesting proteins?

Ans. Trypsin is the pancreatic enzyme which is effective in digesting proteins.

24. Where does digestion of fat take place in our body?

Ans. Digestion of fat takes place in the small intestine of our body.

25. What is alimentary canal?

Ans. It is a long tube extending from mouth to anus in which digestion and absorption of food takes place.

26. Define peristaltic movement?

Ans. Peristaltic movement is define as contraction and relaxation of muscles in the food pipe which brings food down the pipe into the stomach.

27. Name the longest part of the alimentary canal.

Ans. Small intestine.

28. What is emulsification?

Ans. Breakdown of large gloubule fats into smaller fats droplets is known as emulsification.

29. What is the name given to the biological catalyst which speed up the chemical reactions taking place in cells.

Ans. Enzymes.

30. Name the muscle which regulates the exit of food from stomach to small intestine.

Ans. Sphincter muscle.

31. How does the acidic medium in the small intestine is converted into alkaline for pancreatic enzymes?

Ans. By the action of bile juice secreted canal by liver.

32. In which part of alimentary canal digestion does not occur?

Ans. Large intestine.

33. Name the structure which regulates the exit of waste material.

Ans. Anal sphincter.

34. Sate the basic difference between the process of respiration and photosynthesis.

Ans. Respiration uses O_2 and release CO_2 but in photosynthesis, CO_2 is used and O_2 is released

35. Name the pigment present in human which aids in respiration.

Ans. Haemoglobin.

36. Give one point which is common for both aerobic and anaerobic respiration.

Ans. In both aerobic and anaerobic respiration, the chemical used is glucose.

37. Why is anaerobic respiration, glucose molecule is converted to a three molecule. Name it.

Ans. Pyruvate.

38. Name the site of aerobic respiration in cells.

Ans. Mitochondria.

39. Name the acid which build up in the muscle during vigorous physical exercise the causes cramps.

Ans. Lactic acid.

40. What is the common passage for food and air ?

Ans. Pharynx.

41. What is diaphragm?

Ans. Thin muscular septum separating the abdominal and thoracic cavities.

42. What is thoracic cavity?

Ans. Cavity within body where lungs are located.

43. What will happen if the diaphragm of a person gets ruptured in an accident?

Ans. Immediate death due to failure of respiration.

44. Define cilia.

Ans. These are the tiny hair like structures on cells in linings of many parts of respiratory system which removes dust, microbes and other harmful effluents from inhaled air.

45. What is lung cancer?

Ans. It is the uncontrolled growth of cells with abnormal DNA that start off in the one or both lungs, usually in the cells that line the air passages. These cells do not carry out the functions of normal lung cells but erodes the lungs at faster rate.

46. Why is a system if circulation necessary for organisms?

Ans. To Circulate oxygen, products of digestion of food and removal of waste materials.

47. Why is a system of circulation necessary for organisms?

Ans. To circulate oxygen, products of digestion of food an remove of waste materials.

48. Name the chambers of human heart.

Ans. Right atrium and right ventricle, left atrium and left ventricle.

49. Where is the heart situated in our body?

Ans. Thoracic cavity which lies above the diaphragm between the two lungs.

50. What is heart beat?

Ans. Rhythmic expansion and contraction of heart.

51. Name the largest artery in the human body.

Ans. Aorta.

52. What is blood pressure?

Ans. It is the pressure exerted by the forceful flow of blood on the elastic wall of the arteries.

53. How do unicellular organism remove waste?

Ans. By diffusion.

54. What is the other name of the high blood pressure?

Ans. Hypertension.

55. Name the liquid part of the blood.

Ans. Plasma.

56. Name the component of blood that helps in the formation of blood clot in the event of a cut.

Ans. Platelet.

57. Name the phase of the cardiac cycle in which both auricles and ventricles are relaxed simultaneously.

Ans. Diastole.

58. Why do trees shade leaves during winter?

Ans. To reduce transpiration.

59. What is transpiration?

Ans. Loss of water in the form of water vapour from the aerial parts of the plant.

60. Define translocation.

Ans. Transport of food from the leaves to the other parts of the plant.

61. What is ascent of sap?

Ans. Upward movement of cell sap.

62. What are the factors that influence ascent of sap?

Ans. Root pressure and transpiration pull.

63. What is 'translocation' in plants?

Ans. Transport of soluble products of photosynthesis is known as translocation.

64.Name the tissue which transport soluble products of photosynthesis in plant.

Ans. Phloem transport soluble product of photosynthesis in a plant.

65. Name the tissue which transport water and mineral in a plant.

Ans. Xylem transports water and minerals in a plant.

66. Name two excretory products other than O_2 and CO_2 in plants.

Ans. Two excretory product other than O_2 and CO_2 in plants are resins and gums.

67. Why is urine yellow in colour?

Ans. Urine contains urea, uric acid and ammoniac salts which impart yellow colours.

Short Answer Type Question- I **3 marks**

1. Bill juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement.

Ans. Bile juice makes the acidic food coming from the stomach alkaline for the action of pancreatic enzymes. Bile salts break the large globules of fat in the intestine to smaller globules increasing the efficiency of enzyme action. This is similar to the emulsifying action of soaps on dirt.

2. **State the events occurring during the process photosynthesis. Is it essential that these steps take place one after the other immediately?**

Ans. $6CO_2 + 6H_2O \xrightarrow[\text{Chlorophyll}]{\text{sunlight}} C_6H_{12}O_6 + 6O_2$

Carbon dioxide — Water — glucose — Oxygen

Absorption of light energy by chlorophyll.

- Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- Reduction of carbon dioxide to carbohydrates.

These steps need not take place one after the other immediately. For example, desert 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.

3. **In the experimental set up on 'CO_2 is released during respiration', if one forgets to keep the vial with KOH in the conical flask, how will the result very? Give details.**

Ans. In absence of KOH,CO_2 released by germinating seeds is not absorbed , partial vacuum is not created in the conical flask, air pressure in the flask is not reduced , water level does not rise in the delivery tube.

Detailed Answer:

The rise in the level of water indicated that CO_2 produced by germinating seeds respire and produce CO_2, which is absorbed by KOH solution. This creates a vacuum in the conical flask . The air present in the bent glass tube moves into the conical flask. The pulls the water in the bent type further up.

So, if one forgets to keep the vial with KOH solution in conical flask during experiment, then the released CO_2 will not be rise in the tube and the process of respiration will get very slow.

4. **Stomata of desert plants remain closed during day time. How do they take up CO_2 and perform photosynthesis.**

Ans. The desert plants are scotoactive i.e., their stomata open during night. Therefore, they take up CO_2 at night and product intermediate organic acid which breaks up to release CO_2. The CO_2 so produced internally is used in photosynthesis during day when stomata are closed.

5. The rate of breathing in aquatic organisms in much faster than that seen in terrestrial organisms. Give reason.

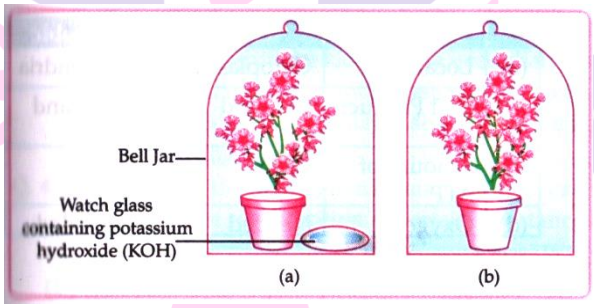
Ans. A terrestrial organism can obtain oxygen directly from the air and have slow breathing rate but aquatic organisms have to obtain oxygen for respiration which is dissolved in water . since, the amount of oxygen dissolved in water is fairly low as compared to the amount of oxygen in air, the rate of breathing in aquatic organisms is much faster.

6. Explain the activity with diagram to show that carbon dioxide is essential for photosynthesis.

Ans. (i) Take to healthy potted plants which are nearly the same size.

(ii) Keep them in a dark room for three days.

(iii) Now place each plant on separate glass plates. Place a watch containing potassium hydroxide by the side of one of the plants. The potassium hydroxide is used to absorb carbon. When the leaves of both the plants were tested for starch, it was found that the leaves of the plants kept in bell jar (b), which is without potassium hydroxide gave the positive test of starch. This shows that CO_2 is essential for photosynthesis.



7. Explain how water and minerals are transported in plants?

Ans. Water and minerals are transport through xylem cells from soil to the leaves. The xylem cells of root, stem and leaves are interconnected to form a conducting channel that reaches all parts of the plant. The root cells take ions from the soil . This create a concentration difference between ions of roots and soil . Therefore, there is a continuous loss of water due to transpiration . This create a suction pressure , which results in absorption of water into xylem cells of roots.

8.List two major steps involved in the formation of urine and state in brief their functions.

Ans. Filtration: Nitrogenous waste such as urea or uric acid are removed from the blood (capillaries).

Reabsorption: Glucose, amino acids, salts and major amount of water are selectively re-absorbed.

9.(a)What is pulse?

(b) How odes paramecium obtain its food?

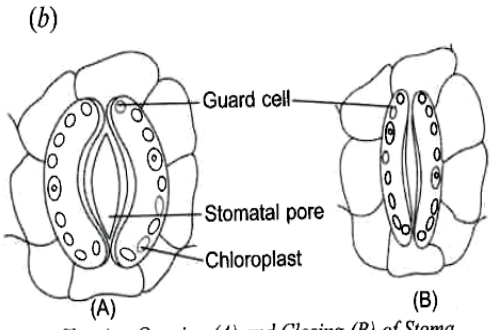
Ans. (a) during each heartbeat, the muscles of the heart contract causing a wave of pressure which force blood through the arteries. This wave of pressure is known as pulse.

(b) Paramecium is a unicellular organism which has a definite shape and the food id taken in at a definite spot known as mouth. The food particle is moved into the mouth by the movement of thin hair like structure known as cilia which covers the whole surface of paramecium cell.

10.(a) What are stomata? What is their role in respiration?

(b) Draw a schematic diagram to show the opting and closing to stomata.

Ans. (a) Stomata are tiny openings found on the surface of the leaves. Stomata functions in gaseous exchange between the plant and the atmosphere. The oxygen of from the air diffuses inside the leaf calls when stomata open and carbon dioxide diffuses out of the leaves through it.



Showing Opening (A) and Closing (B) of Stoma

11. (a) Explain the process of nutrition in Amoeba.

(b) If you chew chapatti for long after some time it taste sweet? Why is this so?

Ans. (a) The various steps of nutrition are ingestion, digestion, assimilation and egestion. When amoeba comes in contact with food particles, it send out pseudopodia, which engulfs the prey by forming a food cup, which is known as ingestion. When the is of the encircling pseudopodia touch each other, the food is encaptured into a bag called food vacuole. The food vacuole serves as a temporary stomach secreting digestive juice, this step absorbed and

diffuses into the cytoplasm and then assimilated. Egestion of undigested food takes place at any point on the surface of the body.

(b) Chapatti contains starch which is converted to simple sugar by the action of enzyme salivary amylase. The salivary glands help in chemical digestion by secreting enzyme.

12.(a) 1 ml of dilute starch solution (1 % starch solution) is taken in test tube and 1 ml of saliva is added to it. After keeping the mixture for an hour, few drops of iodine solution are added to the test tube. Is there any change in the colour of the test tube? What does this tell you about the action of saliva on starch?

(b) How would digestion of food be affected if the bile duct is completely blocked? Explain.

Ans. (a) There is no change in colour when iodine solution is added to the test tube. Saliva had broken down starch into simple sugar which does not react with iodine solution to produce any colour.

(b) If the bile duct is completely blocked, bile juice will not reach the small intestine and the digestion of fats will be affected.

13. **(a) Where are salivary glands situated in man? What are their functions?**

(b) Name the first digestive organ that is associated with the breakdown of proteins in humans. What are its three releases?

Ans. (a) Salivary glands are situated in the mouth of man and contains starch-digestive enzymes.

Salivary glands secrete saliva which helps to lubricate the food for swallowing and helps in digestion of starch.

(b) The first digestive organ in humans is the stomach. It release are enzymes, HCL and mucus.

14. (a) Write the function of large intestine in man.

(b) What is dental caries? What is its adverse effect?

Ans. (a) The walls of large intestine absorbs water and electrolytes from the undigested food forms and stores faeces.

(b) It is the tooth decay which involves destruction of the enamel layer of the tooth by acids produced by the action of bacteria on sugar. If dental caries is not treated, it can spread to the dentine and pulp of the tooth, causing inflammation and infection of the tooth.

15. (a) Why do the walls of a trachea not collapse when there is less air in it?

(b) How are lungs designed in human beings to maximise the area for exchange of gases?

Ans. (a) The walls of trachea does not collapse when there is less air in as it is supported by rings of soft bones of cartilage.

(b) There are millions of alveoli in the lungs. There alveolus provides a very large surface area for the exchange of gases. The availability of large surface area maximises the exchange of gases. For example, if all the alveoli from the two human lungs are unfolded, they would give an area of above 80 square meters.

16. (a) What are enzymes? Name any one enzyme of our digestive system and write its function.

(b) Explain the cause of cramps after excessive physical exercise.

Ans. (a) Enzymes are biological catalysts. Which increase the rate of chemical reactions without being used up.

For example: Salivary amylase catalyses the breakdown of starch into sugars in the mouth and small intestine

(b) During excessive physical exercise, most of our energy in our muscles is produced by aerobic respiration. Anaerobic respiration in muscles provides only some extra energy which is needed under excessive physical exercise. The anaerobic respiration breakdown glucose into lactic acid. This lactic acid accumulates in the muscle. This accumulation of lactic acid in this muscles cause muscle cramps.

17. In human alimentary canal, name the side of complete digestion various components of food. Explain the process of digestion.

Ans. In small intestine, complete digestion of various components of food take place.

The process of digestion of food in mouth, stomach and small intestine in human body are as follows.

Mouth : Digestion of food begins in the mouth, saliva present in mouth contains a digestive enzyme, called salivary amylase, which breaks down starch into sugar.

Stomach: Stomach stores and mixes the food received from the oesophagus with gastric juices. The main components of gastric juice are hydrochloric acid, mucus and pepsin.

Hydrochloric acid dissolves bits of food and creates an acidic medium needed for action of pepsin which digest protein and mucus protects the inner lining of the stomach from the action of HCL.

Small intestine: Small intestine is the site of complete digestion of carbohydrates, proteins and fats. Small intestine produces intestinal juice from the glands present on its wall. The intestinal juice helps in further digestion of food. Small intestine also obtains digestive of food. Small intestine also obtains digestive juices from liver and pancreas that help in mixing of food.

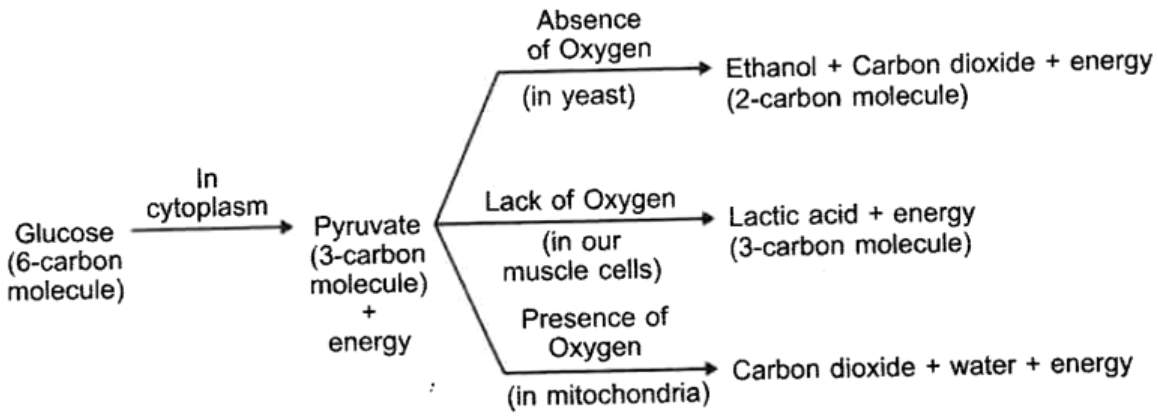
The liver produces bile juice that causes emulsification of fats and the pancreas produces pancreatic juices for digesting proteins and emulsified fats. This digested food is finally absorbed through the intestinal walls.

18. Explain the process of breakdown of glucose in a cell

(a) In the presence of oxygen,

(b) In the absence of oxygen.

Ans. Glucose can be breakdown in three different ways. The process of breakdown of glucose in a cell are as follows:



The first step in the breakdown of glucose both in presence of O_2 and water. Energy released during aerobic respiration is much greater than that released during an anaerobic respiration.

(b) In absence of O_2: In absence of O_2 in yeast pyruvate is converted into ethanol and CO_2 and the process is called fermentation.

In absence of O_2 anaerobic respiration takes place in our muscle cells, pyruvate is converted into lactic acid. The build up of lactic acid in muscle cells causes pain full contractions of muscles which are called cramps.

19. (a) "The breathing cycle is rhythmic where as exchange of gases is a continuous process". Justify this statement.

(b) What happens of conducting tubes of circulatory system develops a leak? State in brief, How could this be avoided?

(c) What is Hypertension? How is it cause? What damage can it do in our body?

Ans. (a) Even though the breathing cycle is rhythmic, the lungs always contain a residual volume of air so the absorption of O_2 and release of CO_2 become continuous.

This could be avoided by maintaining a normal blood pressure.

(c) High blood pressure is known as hypertension. The main cause of hypertension is constriction of very small arteries which results in resistance of blood flow.

High blood pressure can lead to rupture of an artery and internal bleeding .

20. In single called organism diffusion is sufficient to meet all their requirements of food, exchange of gases or removal of wastes but it is not in case of multicellular organisms. Explain the reason for this difference.

Ans. In case of single celled organism, the entire surface of the organism is in contact with the environment and hence no specific organ for taking in food, exchange of gases or removal of waste may be needed. In multicellular organisms, only the cells of skin are in direct contact with the environment. Diffusion is very slow process and it will take very long time to reach all the cells of the body parts. Diffusion is insufficient to melt oxygen requirement.

21. Mention the three kinds of cells present in blood . Write one function of each.

Ans. Blood is made up of plasma and corpuscles. Three kind of cells are:

WBC, RBC and Blood Platelets.

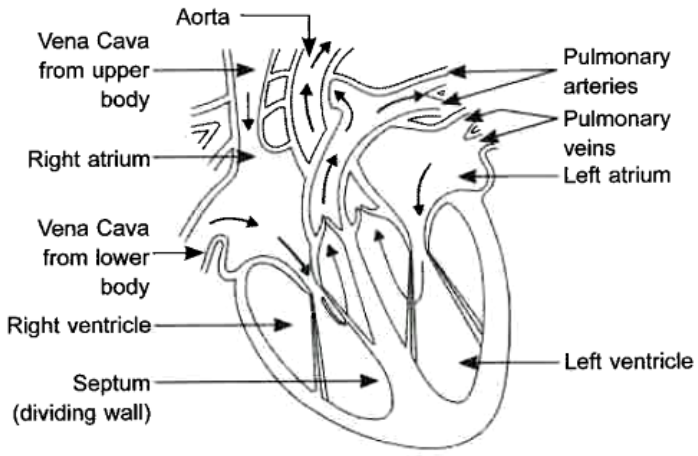
Red Blood Cells (RBC) are Small, Biconvex cells that contain haemoglobin to transport O_2 from the lungs to the body ells and CO_2 from body cells to the lungs. Which blood cells (WBC) main function is defence of the body against diseases and other infection. Blood platelets are responsible for the clotting of blood during injuries.

22. List three types of blood vessels. Give one important feature of each.

Ans. Three type of blood vessels in human circulatory system are –Arteries, Veins and Capillaries. Their functions are tabulated below:

Arteries	Veins	Capillaries
(i) Arteries carry oxygenated blood from heart to various organs of the body (ii) They are thick walled	(i) Veins carry deoxygenated blood from various organs to heart. (ii) They are thin walled.	(i) Exchange of materials between blood and surrounding cells take place in the capillaries. (ii) They are thin walled and extremely narrow tubes or blood vessels which connect arteries to veins

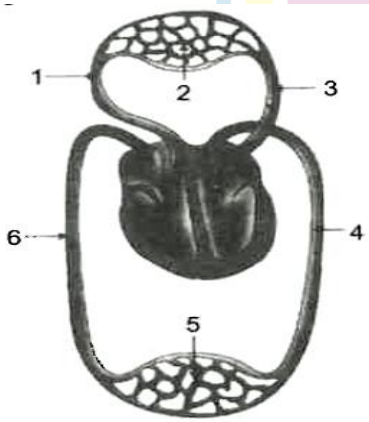
23. Draw a diagram of the front view of human heart and label any six parts including at least two, that are concerned with arterial blood supply to the heart muscles.



External Structure of Human Heart

24. (a) Label any 4 part in the given diagram.

(b) What are the two functions represented in this diagram?



Ans. (a) 1. Pulmonary artery to lungs

7. Lung capillaries

8. Pulmonary vein from lungs

9. Aorta to body

10. Capillaries in body organs

11. Vena cava from body

(b) The two functions represented are:

(i) Transport of oxygen and carbon dioxide

(ii) Exchange of oxygen and carbon dioxide

25. Write one function of each of each of the following components of the transport system in human beings:

(a) Blood vessels **(b) Lymph** **(c) Heart**

Ans. Function of the following components of the transport system in human beings are as follows:

(a) Blood Vessels : There are three types of blood vessels of different sizes involved in blood circulation viz. arteries, veins and capillaries, which are all connected to form a continuous closed system.

(b) Lymph : It carries digested and absorbed fat from intestine and drains excess fluid from extra cellular space back into the blood.

(c) Heart : It is a pumping organ that receives blood from the veins and pumps it into arteries.

26. What is blood pressure? How it is measured? Give one difference between systolic pressure and diastolic pressure.

Ans. Blood pressure: It is the force that blood exert against the wall of a vessel. This pressure is much greater in arteries than in veins.

It is measured by using an instrument called sphygmomanometer.

The pressure of blood inside artery during contraction of ventricular systole is called systolic pressure and pressure in artery during relaxation of ventricular diastole is called

diastolic pressure. The normal systolic pressure is about 120 mm of Hg and diastolic pressure is 80 mm of Hg.

27. State the role of the following in human digestive system:

(a)Digestive enzymes **(b) Hydrochloric acid** **(c) Villi**

Ans:

(a) Digestive enzymes digest the food we eat.

(b) Hydrochloric acid created an acidic medium to facilitate the action

(c) Villi increases the surface area inside the small intestine to facilitate absorption of foods.

28. Describe in brief the function of kidneys, ureters urinary bladder and urethra.

Ans. Function of Kidneys.

It removes the nitrogenous wastes such as urea and excess water from the blood. It regulates the osmotic pressure/water balance/ pH of the blood.

Functions of Ureters:

Urine formed in each kidney is carried by the long tube called ureter to the urinary bladder. Some amount of glucose, amino acid, salt and a major amount of water are reabsorbed in ureter.

Functions of Urinary bladder:

It acts as a reservoir that stores urine before being discharged to the outside.

Functions of Urethra

Urine is passed out from the body through the urethra.

29. How is urine produced?

Ans.

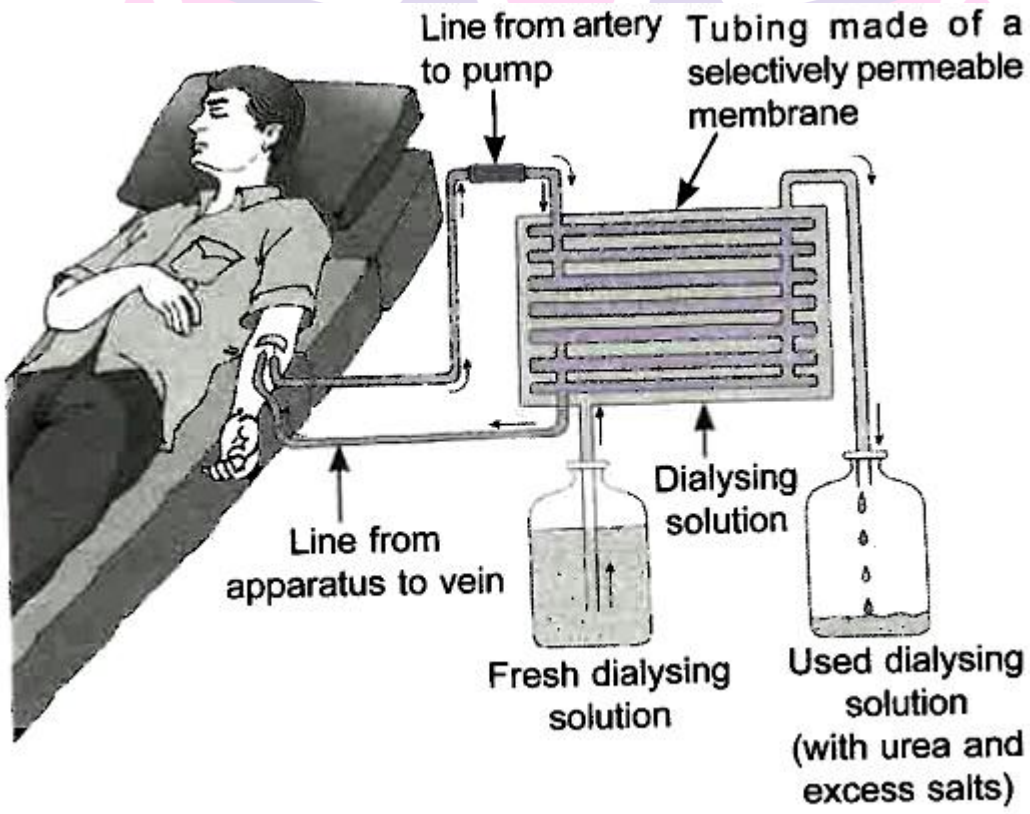
- Formation of Urine. The purpose of urine is to filter out waste products from the blood.
- The nitrogenous waste such as urea or uric acid are removed from blood in the kidneys, thus kidneys are the basic filtration unit.
- Each capillary cluster in the kidney is associated with the cup-shaped end of a tube that collects the filtered urine.
- Each kidney has large numbers of these filtration units called nephrons.
- Some substances in the initial filtrate such as glucose, amino acids, salts and a major amount of water are selectively reabsorbed as the urine flows along the tube. This

depends on how much excess water is there in the body and on how much of dissolved waste is there to be excreted.

- The urine forming in each kidney enters a long tube, the urethra which connects the kidneys with the urinary bladder.
- Urine is stored in the urinary bladder unit the pressure of the expanded bladder leads to pass out through the urethra.

30. Explain the process of dialysis with the help of a diagram.

Ans. It is the procedure used in artificial kidney to replace a non- functional or damaged kidney. In the process, blood of the patient is allowed to pass through the long cellulose tubes dipped in a tank containing dialysing solution having same ionic concentration as plasma. The waste substance diffuse out of the blood into the tank and the cleansed blood is returned back into the patient through a vein.



Short Answer Type Question - II

1. State the role played by the following in the process of digestion: (i) Enzyme trypsin (ii)Enzyme lipase. List two functions of finger like projections present in the small intestine.

Ans. (a) (i) Enzyme trypsin : Helps in the digestion of proteins.

(ii) Enzyme lipase: Helps in the breaking down of emulsified fats

(b) Two functions:

- Increase the surface area.
- Helps in absorption of digested food.

(Note: Full credit for the statement. Increase the surface area for the absorption of food.)

(OR)

Detailed Answer:

(a) (i) Trypsin acts upon proteins and converts it into peptids and amino acids (ii) Lipase is an enzyme that breaks down dietary fats into smaller molecules called fatty acids and glycerol.

(b) Functions of villi

(i) Villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body.

(ii) It also absorb water.

(iii) They increase the surface area for the absorption of food.

2. What is photosynthesis? Explain its mechanism.

Ans. A Process in which green plants take carbon dioxide and water and convert it into carbohydrates /food in the presence of sunlight and chlorophyll.

Mechanism:

i. Absorption of light energy by chlorophyll.
ii. Conversion of light energy to chemical energy.
iii. Splitting of water molecules into hydrogen and oxygen.
iv. Reduction of carbon dioxide to carbohydrate.

3. State the necessary condition for autotrophic nutrition and name the by –product . Mention the source of this by – product. Mention the source of this by-product .

Ans. Condition necessary for autotrophic nutrition are: sunlight, chlorophyll, carbon dioxide and water. The by-product is oxygen. source of by-product(oxygen)is water.

4. Define the term transpiration. Design an experiment to demonstrate this process.

Ans. Transpiration: Loss of water in vapour form through the surface of leaf / stomata of leaf / aerial parts of the plant.

Experiment setup:

Take a potted plant and water it.

Cover the plant / branch with a transparent plastic sheet.

Place it in bright sunlight for half an hour.

Moisture in the form of droplets is observed inside the plastic sheet.

Detailed Answer:

The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration.

Experiment to demonstrate transpiration:

Requirements: Two small pots , soil , a green plant, a stick of same height as of green plant and plastic sheets.

Method:

(i) Take two small pots of approximately equal size having equal amount of soil.

(ii) One should have a plant and place a stick in another pot.

(iii) Cover the soil in both pots with a separate plastic sheet and place in bright sunlight for half an hour .

Observation: Drop of water appear on the inner side of polythene sheet in the pot with a green plant whereas no such drops appear in the pot with a stick.

Result: As water drops appear only in the pot with a green plant, it can be concluded that water drops appeared due to transpiration. While the pot with stick does not have any drop as no plant was present.

5. List two type of the transport system in human beings and write the functions of any one of these.

Ans. (i) Blood circulatory system

(ii) Lymphatic system / lymph or tissue fluid

Functions of blood circulatory system:

(i) Transport of carbon dioxide

(iii)Transport of nitrogenous waste

(iv)Transport of salts

Functions of lymphatic system:

(i) Carrier digested and absorbed fat

(ii) Drains extra fluid from tissue (extra cellular space) back into the blood.

Note: Two functions of any one of the transport system to be given.

6.(a) What is translocation? Why is it essential for plants?

(b) Where do the substances in plants reach as a result of translocation?

Ans. (a) The transport of soluble products of photosynthesis (food or glucose) from one part to the other parts of the plant. To provide of to all parts of the plant.

(b) Root, fruits, seeds and other growing organs/ parts of the plant.

Detailed Answer:

(a) Translocation is the process of movement of materials from leaves to all other parts of the plant body. It is essential for the transfer of products of metabolic processes, particularly photosynthesis from leaves to other parts of the plant.

(b) As a result of translocation, the substances in plants reach to the storage organs such as roots, fruits and seeds and to growing organs.

7. Write three to point of differences between artery and vein.

Ans.

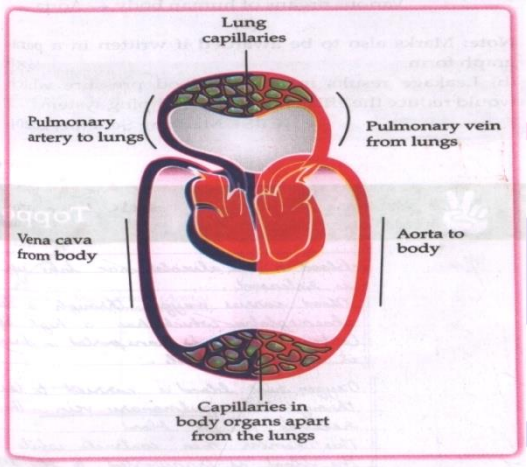
S. No	Artery	Vein
(i)	Wall is thick	Wall is thin
(ii)	Valves absent	Valves present
(iii)	Blood flows from heart to different organs.	Blood flows from different organs to heart
(iv)	The flow of blood is fast, jerky and with great pressure	The flow of blood is slow, steady and less pressure.

8. (i) Mention the site of exchange of material between the blood and surrounding cells.

(ii) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide.

Ans. (i) Capillaries

(ii) See the diagram below



Schematic representation of transport of exchange of oxygen & carbon dioxide

9. Name the following:

(a) The process in plants that links light energy with chemical energy.

(b) Organism that can prepare their own food.

(c) The cells that surround a stomatal pore.

(e) Organisms that cannot prepare their own food.

(f) An enzyme secreted from gastric glands in stomach that acts on proteins.

Ans. (a) Photosynthesis (b) Autotrophs (c) Chloroplasts (d) Guard cells

(e) Heterotrophs (f) Pepsin

10. "All plants give out oxygen during day and carbon dioxide during night", Do you agree with this statement? Give reason.

Ans. Yes, respiration takes place throughout day and night but photosynthesise occurs only during the day. During daytime, plants give out oxygen which is a product of photosynthesis. Thus, during night when there is no photosynthesis, plants liberate carbon dioxide.

11. Two green plants are kept separately in oxygen free containers. One in dark and other in continuous light which one will loner? Give reasons.

Ans. The plants which kept in continuous light will live longer because in light, the plant will be able to undergo photosynthesis and able to convert carbon dioxide into oxygen whereas the plant in dark cannot perform photosynthesis and lack of oxygen will kill the plant.

12. Why do fishes die when taken out of water?

Ans. Fishes die when taken out of water because they cannot obtain gaseous oxygen. They breathe through gills, which are richly supplied with blood capillaries and can readily absorb oxygen dissolved in water.

13. Is 'nutrition' a necessity for an organism? Discuss.

Ans. Yes, 'nutrition' is a necessity for an organism because:

(i) It is required for the growth of new cells and repair of worn our cells.

(ii) It is required to develop resistance against various diseases.

(iii) It gives us energy for various metabolic activities of our body.

14. What would happen if green plants disappear from earth?

Ans. If green plants disappear from earth, then the herbivores will die of starvation followed by carnivores are then decomposers.

15. Leaves of a healthy plotted plant were coated with Vaseline will this plant remain healthy for longs? Give reasons for your answer.

Ans. (a) The plant will die soon because layer of Vaseline will prevent the exchange of gases for respiration.

(b) It will also close the stomatal openings and plant won't be able to et necessary raw materials for photosynthesis.

16. What are the adaptations of leaf for photosynthesis?

Ans. The adaptations of leaf for photosynthesis are as follows:

(i) Leaf has a large surface area to absorb maximum light.

(ii) Arrangement of leaves in order to absorb optimum amount of light.

(iii) The large number of veins provide mechanical strength and also take part in quick transport of substances to and from the mesophyll cells.

(iv) Leaf is the site of transpiration which cools the leaf surface for optimum photosynthesis.

(v) Leaf has numerous stomata for gaseous exchange.

(vi) Large number of chloroplasts are present on upper surface of leaves.

17. Why do herbivores have longer, small intestine than carnivores?

Ans. Cellulose is difficult to digest and hence takes a longer time for complete digestion which is why herbivores need a comparatively longer small intestine. Meat is a comparatively shorter small intestine.

18. Why is small intestine in herbivores longer than in carnivores?

Ans. Herbivores eat grass and need a longer small intestine to all complete digestion of cellulose. But carnivores cannot digest cellulose, and therefore they have a shorter intestine.

19. What will happen if mucus is not secreted by the gastric glands?

Ans. If mucus is not secreted by the gastric glands, it will lead to corrosion of inner lining of stomach, causing excessive acidity, ulcers and extreme discomfort as mucus protects the inner lining of stomach from the action of hydrochloric acid and enzyme pepsin.

20. Why does absorption of digested food occur mainly in the small intestine?

Ans. Absorption of digested food occur mainly in the small intestine because:

(i) Digestion of food is completed in small intestine.

(ii) Inner lining of small intestine bears a number of finger-like projections called villi, which increases the surface area for absorption.

(iii) Wall of intestine has blood vessels for carrying the absorbed food to different part of the body.

21. Why is the rate of breathing in aquatic organisms much faster than in terrestrial organisms?

Ans. The rate of breathing in aquatic organisms is much faster than in terrestrial organisms because the amount of dissolved oxygen in water is low as compared to the amount of oxygen in the air. Aquatic animals take in water through their mouths and past it to the gills where the dissolved oxygen is taken up by blood.

22. What is the advantage of having four chambered heart.

Ans. The advantage of having four chambered heart is that it prevent oxygenated and deoxygenated blood from mixing, as the left half of the four chambered heart is

completely separated from right half by septa. This mechanism is useful to animals with high energy needs such as birds and mammals. In this way, highly efficient supply of oxygenated blood is passed to all parts of the body.

23. In each of the following situations what happens to the rate to photosynthesis?

(a) Cloudy days

(b) No rainfall in the area

(c) Good manuring in the area

(d) Stomata gets blocked due to dust.

Ans. (a) In cloudy days, photosynthesis is reduced due to low light intensity.

(b) In case of no rainfall in the area, rate of photosynthesis decreases.

(c) With good manuring in the area, rate of photosynthesis increases, it increases soil fertility.

(d) When stomata gets blocked due to dust, photosynthesis decreases by reducing gaseous exchange.

24. Name the energy currency in the living organisms. When and where it produced?

Ans. Adenosine triphosphate(ATP) is the energy currency of the living organisms. It is produced during respiration in living organisms. It is produced during respiration in living organisms and also during photosynthesis is plants.

25. What is common for cuscuta, ticks and leeches?

Ans. All are parasites and they derive their nutrition from their hosts directly killing them.

26. What are the functions of gastric glands present in the wall of the stomach?

Ans. Functions of the gastric glands present in the wall of the stomach are as follows.

(i) Secretion of mucus for protection of inner lining of stomach

(ii) Secretion of HCl which makes the food soft and acidified for pepsin to act upon food.

(iii) Secretion of pepsin enzyme that digests proteins.

27. Plants have low energy needs as compared to animals. Explain.

Ans. Plants have low energy needs as compared to animals because plants do move and most of their body is made up of dead cells like sclerenchyma. But animals move about in search of food, mate and shelter.

28.Why and how does water enter continuously into the root xylem?

Ans. Cells of root are in close contact with soil and so actively take up ions. Ions pass inward increasing osmotic concentration of xylem. Because of it water from the soil continuously pass into the root xylem.

29.How do leaves of plants help in excretion?

Ans. (a) In leaves, the waste materials are stored in the vacuoles of mesophyll and epidermal cells. When old leaves falls, the waste materials are excreted along with the leaves.

(b) Transpiration of gases via stomata helps in removal of gaseous waste of respiration and photosynthesis

Long Answer Type

(5 marks each)

1. (a) A gas is released during photosynthesis. Name the gas and also state the way by which the gas is evolved.

(b) What are stomata? What governs the opening and closing of stomata?

Ans. (a) The gas released during the process of photosynthesis is oxygen which comes from water. During photosynthesis, plants absorb carbon dioxide and sunlight to produce carbohydrates. The solar energy trapped by chlorophyll breaks down water molecules by the process of photolysis of water release oxygen.

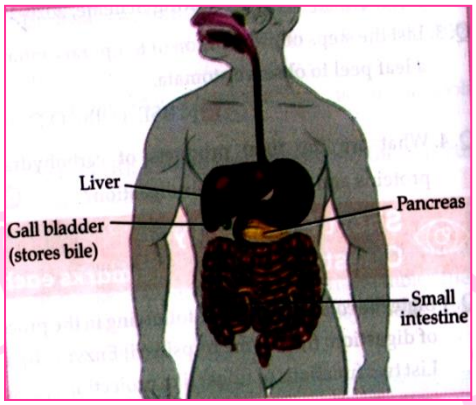
(b) stomata re tiny pores present on the surface of the leaves.

The opening and closing to stomatal pores are controlled by the turgidity of guard cells. When guard cells uptake water from surrounding cells, they swell to become a turgid body. This enlarges the pore in between and cause stomatal opening When water is released , they become flaccid . This closes the pore in between thereby stomatal closing.

2. (a) Draw a diagram of human alimentary canal and label-gall bladder , pancreas , liver and small intestine in it.

(b) Give two reasons to explain why absorption of digested food occurs mainly in the small intestine.

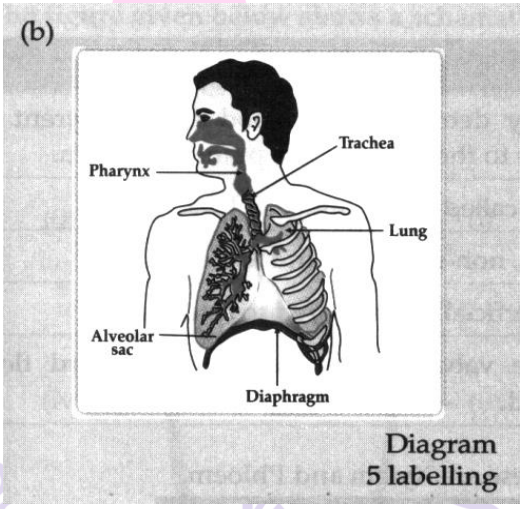
Ans.(a)



(b) Absorption of digested food occurs mainly in the small intestine because it has finger like protections called villi which help in absorption of food into blood. Villis contains a lymph capillary called lacteal in the center. Lacteal in turn is surrounded by a network of thin and small blood vessels called blood capillaries close to its surface. As the food moves slowly between, over and around the villi, the surface of villi absorbs the digested food materials into blood flowing through them. Blood, in turn, carries the absorbed food material to all the parts of the body . in the cells, food is used for energy, repair and growth. This process is known as assimilation.

3. (a) Why is there a difference in the rate of breathing between aquatic organisms and terrestrial organisms? Explain.

(b) Draw a diagram of human respiratory system and label – pharynx , trachea, lungs , diaphragm and alveolar sac on it.



Ans. (a) Terrestrial organisms can obtain oxygen directly from the air and have slow breathing rate but; aquatic organisms have to obtain oxygen for respiration which is dissolved in water is

fairly low as compared to the amount of oxygen in air; the rate of breathing in aquatic organisms is much faster.

(b) Diagram of human respiratory system:

Refer CBSE Marking scheme for figure.

4. (a) Write the correct sequence of steps followed during journey of oxygen rich blood from lungs to various organs of human body.

(b) What happens when the system of blood vessels develop a leak?

Ans. (a) Oxygenated Blood from lungs into Pulmonary Vein (1)

↓

Left Atrium (Collects Blood on relaxation) (2)

↓

Contraction of Left Atrium (3)

↓

Left Ventricle (4)

↓

Collects blood on expansion (5)

↓

Contraction of left ventricle (6)

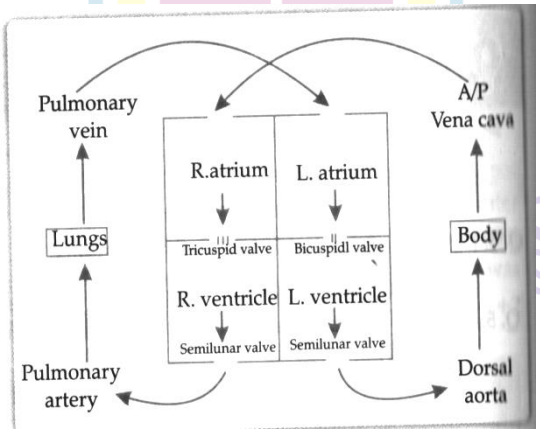
↓

Various organs of human body through Aorta (7)

Note: Marks also to be awarded if written in a paragraph form.

(b) Leakage results in loss of blood pressure which would reduce the efficiency of the pumping system.

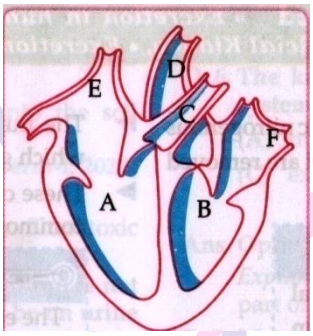
Detailed Answer:



(b) The leaked blood flows into surrounding tissues leading to accumulation of blood . This condition is known as hematoma.

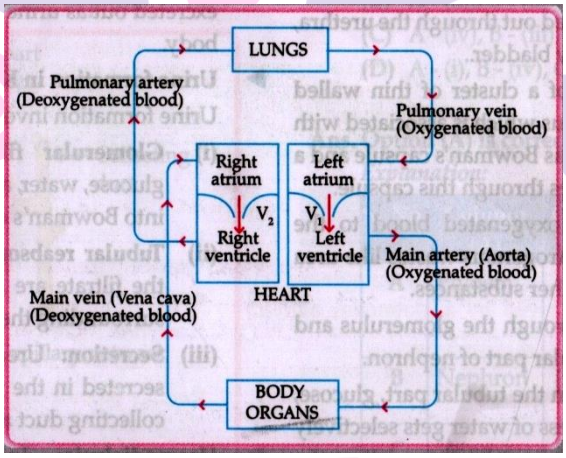
5. **(i) Identify any two parts from the diagram given which carry oxygenated and deoxygenated blood**

(ii) Explain the process of double circulation which the help of flow chart.



Ans. (i) Oxygenated : F/B/D [B = Left ventricle/D=Aorta/F=left auricle/Pulmonary vein]

Deoxygenated E/A/C [A=Right ventricle / C = Pulmonary artery/E=Right auricle/Vena cava]



V_1 = Bicuspid valve/Mitral valve

V_2 = Tricuspid valve

(1 mark should be deduced if the arrows are not correctly marked)

6. **(a) Name the organs that form the excretory system in human beings**

(b) Describe in brief how urine is produced in human body.

Ans. (a) A pair of kidney, a pair of ureters, a urinary bladder and a urethra.

(b) A kidney has a large number of filtration units called nephrons. Each nephron has cup shaped bowman's capsule containing a bunch of capillaries called glomerulus. Blood gets filtered in the glomerulus . Filtrate gets collected in Bowman's capsule. Some useful

substances such as glucose, amino acids, salt and water are selectively re-absorbed as urine flows through nephron tube. The urine formed in each kidney is eventually stored in the urinary bladder.

Detailed Answer:

(a) Human excretory system comprises: a pair of kidneys , a pair of ureters, a urinary bladder and urethra.

(b) Urine formation involves three steps:

(i) Glomerular filtration : Nitrogenous wasters, glucose , water, amino acids filter from the blood into Bowman's capsule of the nephron.

(ii) Tubular reabsorption : Useful substances for the filtrate are re-absorbed back by capillaries surrounding the nephron.

(iii) Secretion : Urea, extra water and salts are secreted in the tubule which open up into the collecting duct and then into the ureter.

7. (a) How do leaves of plants help in excretion? Explain briefly.

(b) Describe the structure and function of a nephron.

Ans. (a) Oxygen and CO_2 produced during photosynthesis and respiration is given out through stomata in the leaves.

When leaves become old, they fall off carrying waste materials along with them in their vacuoles.

(b) Structure of Nephron:

Nephron is the basic filtration unit in the kidney which is made of fine tubules, one end of which form a cup – shaped structure called Bowman's capsule, and the other end opens into a collecting duct/tube.

Function of Nephron:

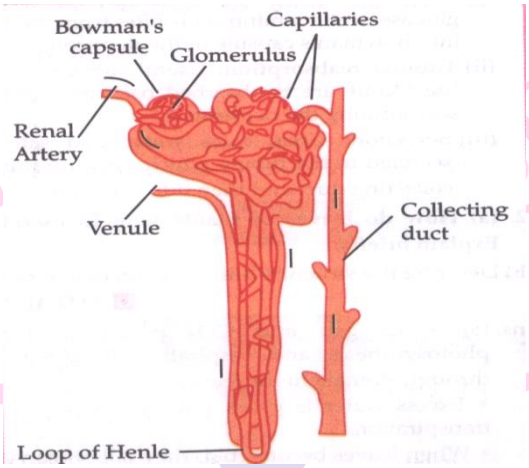
Blood carrying nitrogenous wastes is filtered through the glomerulus and is collected in the Bowman's capsule, some useful substances in the filtrate like glucose and water etc., are selectively re-absorbed as the filtrate flows along the tube.

Detailed Answer:

(a) Leaves of plants is removed by the process of transpiration and guttation.

(b) Structure of a Nephron: Each kidney contains many filtration unit called as nephrons. Nephrons are made up of cluster of thin walled capillaries called glomerulus which is associated with a cup like structure called Bowman's capsule and the long tube which

terminates through this capsule. The artery which takes blood to the glomerulus is called afferent arteriole and the one receiving blood from the glomerulus is called efferent arteriole.



Functioning of Nephron:

- The blood enter the kidney through the renal artery, which branches into many capillaries associated with glomerulus.
- The water and solute are transferred to the nephron at Bowman's capsule.
- In the proximal tubule, some substances such as amino acids, glucose , and salts are selectively reabsorbed and unwanted molecules are added in the urine.
- The filtrate then moves down into the loop of Henley, where more water is absorbed.
- From here, the filtrate moves upwards into the distal tubule and finally to the collecting duct. Collecting duct collects urine from many nephrons.
- The urine formed in each kidney enters a long tube called ureter. From ureter,it gets transported to the urinary bladder and then the urethra.

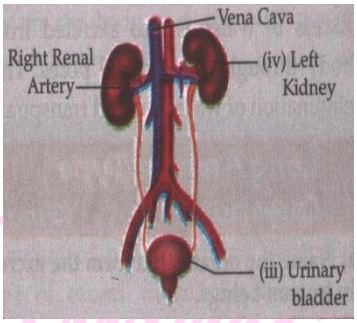
8. (a) Draw a diagram of human excretory system and label the following parts on it:

(i) Right Renal Artery **(ii) Vena Cava**

(iii) Urinary bladder **(iv) Left kidney**

(b) List two vital functions of kidney.

Ans. (a)



(b) Vital functional of kidney:

(i) To regulate right amount of water in body.

(ii) Helps in filtering out nitrogenous waste like urea from blood.

9. (a) What is ATP? What is its use?

(b) How does smoking affect the health of a person?

(c) Describe the circulatory system on a fish.

Ans. (a) It refers to nitrogenous compound. Adenosine Tri-Phosphate. The energy released during cellular respiration is immediately used to synthesise a molecule called ATP from ADP and inorganic phosphate.

ATP is used to fuel all other activities in the cell. Therefore, it is said to be the energy currency for most cellular processes.

(b) Small hair like structure, called cilia are available on the upper part of the respiratory tract. The function of cilia is to remove germs, dust and other harmful particles that enter our body through inhaled air. Smoking destroys cilia due to which germs, dust, smoke and other harmful chemicals enter our lungs and cause various infections and cough. Smoking is one of the main cause for lung cancer.

(c) Fish have two chambered heart comprises of one atrium and one ventricle. In place of lungs, fish has gills to oxygenate blood. The heart pumps deoxygenated blood to the gills. Oxygenation of blood take place in the gills and oxygenated blood from the gills is supplied to the rest of the body.

10. (a) Account for the following.

Amphibians or many reptiles have three chambered heart and can tolerate mixing of oxygenated and deoxygenated blood.

(b) Why are the walls of ventricles thicker than the auricles?

(c) state two sources from which plants obtain nitrogen for the synthesis of proteins and other compounds.

Ans. (a) Animals such as amphibians and reptile are cold blooded animals whose body temperature depend on the temperature of the environment. These animals do not require much energy as they do not maintain their body temperature. So, if there is mixing of the oxygenated and so, if there s mixing of the oxygenated and deoxygenated blood take place, then the energy produced by the cell is less, which is fine for animals like amphibians and many reptiles.

(b) The walls of ventricles are thicker than the auricles because ventricles have to pump the blood to all the part of the body during their contraction. To counteract the backward pressure exerted by the blood, the walls of the ventricles have to be thicker otherwise it may lead to bursting of heart.

(c) The two sources from which plants obtain nitrogen for the synthesis of proteins and other compounds are

(i) Inorganic nitrates or nitrites.

(ii) Organic compounds prepared by bacteria from atmospheric nitrogen.

11. (a) Name the process and explain the type of nutrition found in green plants. List the raw materials required for this process. Give chemical equation for the mentioned process.

(b) Write three events that occur during this process.

Ans. (a) – Photosynthesis is the process.

- Green plants show autotrophic nutrition.
- The raw materials required for photosynthesis are carbon disoxide and water and energy in the form of sunlight .
- The equation is as follows:

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

(b) The three events in photosynthesis are

(i) Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

(iv) Reduction of carbon dioxide to carbohydrates .

12. Define heterotrophic nutrition. What are the various type of heterotrophic nutrition? Give example of each.

Ans. Heterotrophic Nutrition : The type of nutrition in which organisms derive their food (nutrients) from other living organisms derive their food (nutrients) from other living organisms. In heterotrophic nutrition, the energy is derived from the intake and digestion of the organic substances, normally of plant or animal tissue.

Heterotrophic mode of nutrition are of different types:

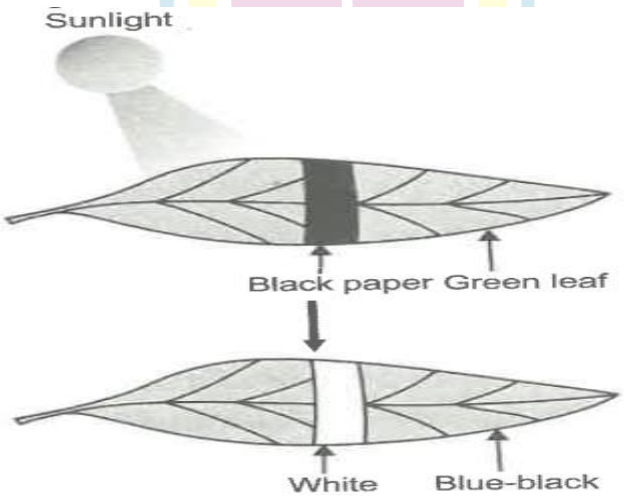
(i) Saprotrophic Nutrition : It refers to the mode of nutrition in which organisms obtain nutrients from the dead and decaying organic matter, e.g., fungi, yeast and bacteria are called saprophytes.

(ii) Parasitic Nutrition : It refers to the mode of obtaining which obtains food is called the 'parasite' and the organism from which food is absorbed is called he 'host'. This nutrition is observed in fungi, bacteria, a few plants like cuscuta and some animals like plasmodium and roundworm.

(iii) Holozoic Nutrition : It refers to the mode of nutrition in which the complex organic matter in the form of solid food is ingested, digested and then the cells and utilised, e.g., Amoeba, frog, human beings.

13. Describe an experiment to show that "sunlight is essential for photosynthesis."

Ans. Sunlight is essential for photosynthesis: A healthy green potted plant is placed in a dark room for 1-2 days. This is done to ensure that the plant consumes all its reserve food and the leaves do not contain any starch. Both sides of a green leaf is covered with two uniform pieces of black paper and then fix the cover in position with two paper clips.



Now, the plant is exposed to bring light After few hours, the leaf is removed and it is decolourised with alcohol. Now, the presence of food(starch) is tested by putting iodine solution on the leaf. It can be observed that the covered portion of the leaf does not show any presence of starch(food).

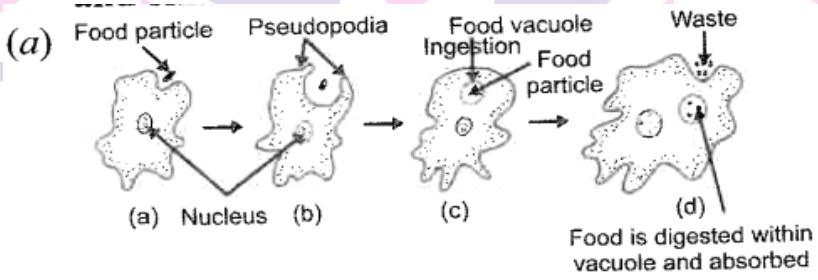
This is because plants store the food prepared by the process of photosynthesis as starch. Starch reacts with iodine solution to give blue-black colour. In this experiment., only those portions of the leaf that were exposed to light could photosynthesise. Hence, the uncovered portion of the leaf gives blue-black colour when tested with iodine. So the coved portion does not change its colour when treated with iodine solution.

Thus, it can be concluded that the sunlight is essential for photosynthesis.

14.(a) Draw a diagram to show the nutrition in amoeba and label the parts used for this purpose. Mention any other purpose served by this part other than nutrition.

(b) How do guard cells regulate the opening and closing of stomatal pore?

(c) How is required pH maintained in the stomach and small intestine?



Nutrition in Amoeba

Pseudopodia serves the purpose of locomotion apart for nutrition.

(b) The opening and closing of the pore is a function water flow into them causing the stomatal pore to open. Similarly, the pore closes if the guard cells shrink. As large amount of water is lost through these stoma, the plant closes these pore when it does not require carbon dioxide for photosynthesis.

(c) Gastric gland present on the walls of the stomach release HCl acid. HCl creates an acidic medium, which facilitates the action of enzyme pepsin. Bile juice from liver makes the food alkaline in small intestine for the pancreatic enzymes to act.

15. (a) Write the difference between inhalation and exhalation.

(b) State the roles of Liver and pancreas.

(c) Name the organ which performs the following functions in humans:

(i) Absorption of digested food.

(ii) Absorption of water.

Ans. (b)

Inhalation	Exhalation
(a) The diaphragm contracts and is pulled down and flattened (b) Volume of the thorax increases	(a) The diaphragm relaxes and is pushed back to its original position. (b) Volume of the thorax decreases.

(b) Liver: It secretes bile juice which breaks down fats into fat globules.

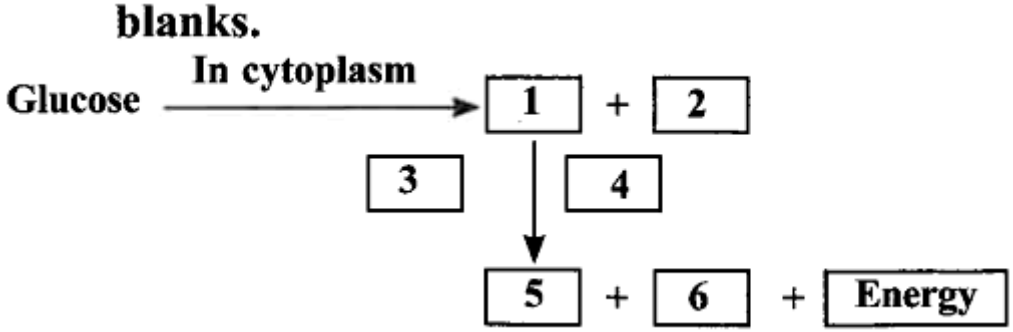
Pancreas: It secretes pancreatic juice which contains protein digesting and starch digesting enzymes.

(c) The organ which performs the following functions in humans are as follows:

(i) Absorption of digested food – Ileum of small intestine.

(ii) Absorption of water – Large intestine.

16. (a) Complete the glucose breakdown pathways in case of aerobe respiration by filling the blanks.



(b) Name the molecule in the cell which store the energy produced at the end of the pathway.

(c) Why do we get cramps during vigorous muscular activity?

Ans. (a) Pyruvate (3 carbon molecules)

(2) Energy (3) Presence of oxygen

(4) In mitochondria (5) Carbon dioxide

(6) Water

(b) ATP

(c) Lactic acid accumulation. I the absence of oxygen(anaerobic respiration) cause cramps.

17. (a) Write the reaction that occurs when glucose breaks down anaerobically in yeast.

(b) Write the mechanism by which fishes breath in water.

(c) Name the balloon likes structures present in lungs. List its two functions.

(d) Name the respiratory pigment and write its role in human beings.

Ans.

(a) Glucose $\xrightarrow[\text{Cytoplasm}]{\text{In the}}$ Pyrvvate $\xrightarrow[\text{Cytoplasm}]{\text{In the}}$ Ethanol + carbon dioxide + Energy.

(b) Fishes breathe with the gills by diffusion.

(c) Alveoli are the balloon – like structures.

- They provide a surface for exchange of gases.

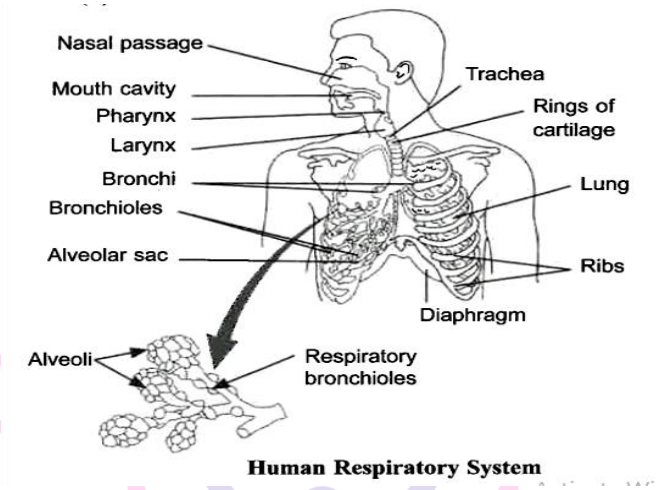
- They contains a residual volume of air so that there is sufficient time for exchange of gases.

(d) Haemoglobin is the respiratory pigment in humans. It transport a major part of oxygen and some amount of carbon dioxide through blood.

18. (a) Draw a labelled diagram of the respiratory system of human beings with diaphragm at the end of expiration.

(b) List four conditions required for efficient gas exchange in an organism.

Ans. (a)



Human Respiratory System

(b) The conditions required for efficient gas exchange in an organism are that the membrane should be extensive, thin, highly vascularised and easily permeable to oxygen and carbon dioxide.

19. (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.

Ans. (a) Blood is composed of plasma and three types of cells – Red blood cells, white blood cells and platelets.

(b) – Oxygenated blood from the lungs is brought to the left atrium by pulmonary veins.

-When the atrium contracts, blood is transferred to left ventricle.

-When the ventricle contracts, blood is pushed into the aorta and through arteries to all parts of the body.

(c) The valve prevents the backflow from ventricles into atria.

(d)

Arteries	Veins
(i) They have thick elastic walls (ii) They have so internal valves	(i) They are thin walled (ii) They have valves internally.

20. (a) What are the function of lungs?

(b) State functions of the following components of transport system:

(i) Blood **(ii) Lymph**

Ans. (a) The functions of the following components of the transport systems are:

(i) Blood:

- Oxygen is transported to the tissues of the body for the purpose of respiration.
- Carbon dioxide is transported to the lungs by the blood plasma.
- The digested and absorbed nutrients are transported to the tissues.
- Nitrogenous wastes are transported to the kidneys.
- The blood regulates the body temperature.
- It maintains water balance to constant level.
- The lymphocytes produce antibodies against the invading antigens and protects from diseases.
- Blood helps in rapid healing of wounds by forming a clot at the site of injury.

(ii) Lymph :

- It carries digested and absorbed from intestine and drains excess fluid extracellular space back into the blood.
- It protects the body by killing the germs drained out of the body tissues with the help of lymphocyte contained in the lymph nodes.

(b) The functions of lungs are as follows:

(i) They intake oxygen from the air packed inside the lungs and give out carbon dioxide.

(ii) They purify the blood by supplying oxygen to it and removing carbon dioxide from blood.

21. (a) Name the blood vessel that beings oxygenated blood to the human heart.

(b) Which chamber of human heart receives oxygenated blood?

(c) Explain how oxygenated blood from this chamber is send to all parts of the body.

Ans. (a) The pulmonary vein brings oxygenated blood to the human heart.

(b) The left auricle of human heart receives oxygenated blood.

(c) (i) When oxygenated blood comes into the left atrium, it contracts and pours blood into left ventricle.

(iii) The left ventricle contracts and the oxygenated blood from here is distributed to all parts of the body through aorta.

22. (a) Define excretion.

(b) Name the basic filtration unit present in the kidney.

(c) Draw excretory system to human beings and label the following organs of he excretory system which perform following functions:

(i) form urine.

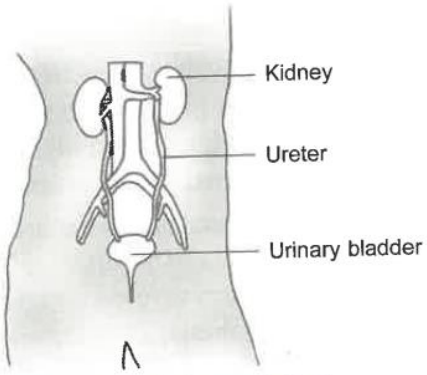
(ii) is a long tube which collects urine from kidney.

(iii) store urine until it is passed out.

Ans. (a) Excretion is the biological process of removal of harmful metabolic wastes from the body.

(b) Nephrons.

(c) (i) Kidney



Excretory system in human beings

(ii) Ureter

(iii) Urinary bladder

23. (a) State two functions performed by bile juice.

(b) Mention the site of complete digestion in our body? Name the end products formed on complete digestion of carbohydrates, proteins and fats.

(c) What happens to glucose that enters the nephron along with filtrate?

Ans. (a) Bile juice in secreted by the liver. (i) It contains bile pigment, bile salts that emulsifies fat to fatty acids. (ii) Bile juice also neutralizes the acidic food in the stomach and makes it alkaline so that it can react with the enzymes of pancreatic juice.

(b) The side of complete digestion in our body is the small intestine. The end products formed on complete digestion of carbohydrates is glucose, protein is amino acids and fats is faty acid and glycerol.

(c) During excretion in human beings, glucose which enters the nephron along with filtrate gets reabsorbed by blood capillaries surrounding the nephron.

24. Explain the importance of soil for plant growth.

Ans. Importance of soil for plant.

(i) It anchors the plant.

(ii) It is the source of water and minerals.

(iii) It helps in symbiotic association with microbes.

(iv) It helps for respiration of root cells due to availability of oxygen of food material.

25. Describe the alimentary canal of man.

Ans. Alimentary canal in man is 9 metres long and consists of the following parts:

(i) Mouth , It leads into buccal cavity.

The floor of the buccal cavity has a tongue hearing taste buds. Man possess teeth on both the jaws. There are 32 teeth of four different types, namely incisors, canines, premolars and molars.

(ii) Pharynx. It is a short, conical region that lies after the mouth cavity.

(iii) Oesophagus. It is a long, narrow, muscular tube which leads to the stomach.

(iv) Stomach. It lies below the diaphragm on the left-side of abdominal cavity and is J-shaped. The food is stored and partly digested in the stomach.

(v) Small Intestine. It is a convoluted tube and differentiated into three regions, Viz., duodenum, which is the first part of small intestine and is curved C-shaped; jejunum, comparatively longer and more coiled, and ileum, which is the last part of small intestine whose inner surface is folded to form villi, which absorbs the products of digestion.

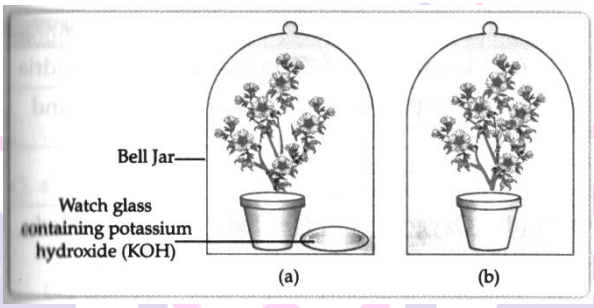
(vi) Large Intestine. It is much shorted and wider than small intestine and is differentiated into three regions viz., caecum, which is small rounded blind sac from which vermiform appendix arises; colon is the inverted U-shaped tube and the rectum opens to exterior through anus.

(4 marks each)

COMPETENCY BASED QUESTIONS

I. Read the given passage and answer the following questions:

The figure shown below represents an activity to prove the requirement for photosynthesis. During this activity, two healthy potted plants, KOH is kept in the watch glass in setup are air tight and have been kept in light for 6 hours. Then, iodine Test is performed with one leaf from each of the two plants X and Y.



1. This experimental setup is used to prove essentiality of which of the following requirements of photosynthesis?

   a. Chlorophyll
   b. Oxygen
   c. Carbon dioxide
   d. Sunlight

2. The function of KOH is to absorb

   a. Oxygen
   b. Carbon dioxide
   c. Moisture
   d. Sunlight

3. Which of the following statements shows the correct results of Iodine Test performed on the leaf from plant X and Y respectively?

   a. Blue-Black would be obtained on the leaf of plant X and no change in colour on leaf of plant Y.

   b. Blue-black colour would be obtained on the leaf of plant Y and no change I colour on leaf of plant X.

   c. Red colour would be obtained on the leaf of plant X and brown colour on the leaf of plant Y.

   d. Red colour would be obtained on the leaf of plant Y and brown colour o the leaf of plant X.

4. Which of the following steps can be followed for making the apparatus air tight?

   (i) Placing the plants on glass plate.

   (ii) using a suction pump.

   (iii) applying Vaseline to seal the bottom of jar

(iv) Creating vacuum

a. (i) and (ii) b. (ii) and (iii) **c. (i) and (iii)** d.(ii) and (iv)

II. Read the given passage and answer any four questions from 1 to 5.

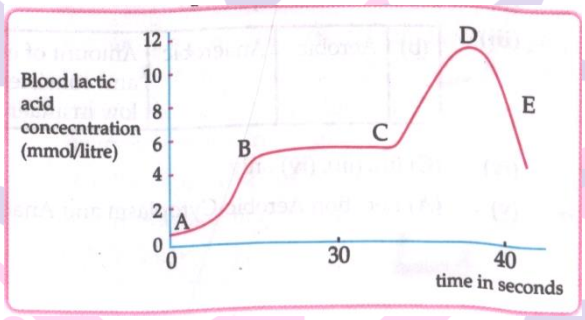
All living cells require energy for various activities. This energy is available by the breakdown of simple carbohydrate either using oxygen or without using oxygen.

1. Energy in the case of higher plants and animals is obtained by.

a. Breathing b. Tissue respiration

c. Organ respiration d. Digestion of food.

2. The graph below represents the blood lactic acid concentration of an athlete during a race of 400 m and shows a peak at point D.

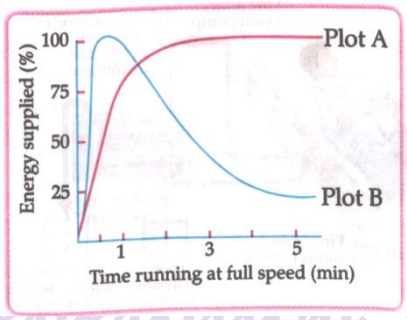


Lactic acid production has occurred in the athlete while running in the 400 m race. Which of the following processes explains this event?

a. Aerobic respiration b. Anaerobic respiration

c. Fermentation d. Breathing

3. Study the graph below that represents the amount of energy supplied with respect to the time while an athlete is running at full speed.



Choose the correct combination of plots and justification provided in the following table.

	Plot A	Plot B	Justification
(A)	Aerobic	Anaerobic	Amount of energy is low and inconsistent in aerobic and high in anaerobic
(B)	Aerobic	Anaerobic	Amount of energy is high and consistent in aerobic and low in anaerobic
(C)	Anaerobic	Aerobic	Amount of energy is high and consistent in aerobic and low in anaerobic

4. The characteristic processes observed in anaerobic respiration are

(i) Presence of oxygen

(ii) Release of carbon dioxide

(iii) Release of energy

(vii) Release of lactic acid

a. (i) , (ii) only

b. (i),(ii),(iii) only

b. c. (ii), (iii), (iv) only

d.(iv) only

5. Study the table below and select the row that has the incorrect information.

		Aerobic	**Anaerobic**
(a)	Location	Cytoplasm	Mitochondria
(b)	End product	CO_2 and H_2O	Ethanol and CO_2
(c)	Amount of ATP	High	Low
(d)	Oxygen	Needed	Not needed

Ans:

(i) (B) Tissue respiration.

(ii) (B) Anaerobic respiration

(iii)

(b)	Aerobic	Anaerobic	Amount of energy is high and consistent in aerobic and low in anaerobic

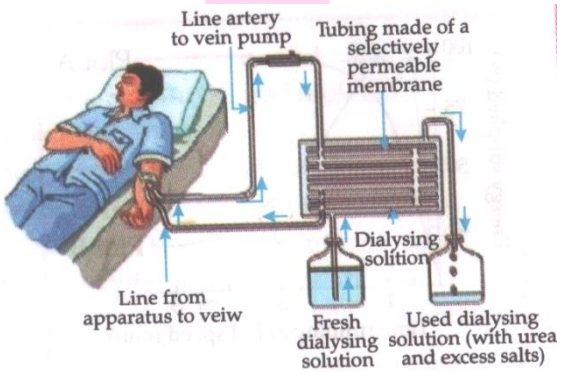
(iv) (C) (ii) , (iii) , (iv) only

(v) (A) Location Aerobic-Cytoplasm and Anaerobic-Mitochondria

(D)	Anaerobic	Aerobic	Amount of energy is high and inconsistent in anaerobic and low in aerobic

III. Reading the given passage and answer the following questions:

The figure shown below represents a common type of dialysis called as Haemodialysis. It removes waste products from the blood, such as excess salts, and urea which are insufficiently removed by the kidney in patients with kidney failure. During the procedure, the patient's blood is cleaned by filtration through a series of semi- Permeable membrane before bring returned to the blood of the patients. On the basic of this, answer the following questions:



1. The haemodialyser has semi-permeable lining of tubes which help to:

a. To maintain osmotic pressure of blood.

b. To filter nitrogenous wastes from the dialysing solution.

c. In passing the waste products in the dialysing solution.

d. To pump purified blood back into the body of the patient.

2. Which one of the following is not a function of Artificial kidney?

a. To remove nitrogenous wastes from the blood.

b. To remove excess fluids from the blood.

c. To reabsorb essential nutrients from the blood .

d. To filter and purify the blood.

3. The used dialysing solution is rich in;

a. Urea and excess salts b. Blood cells

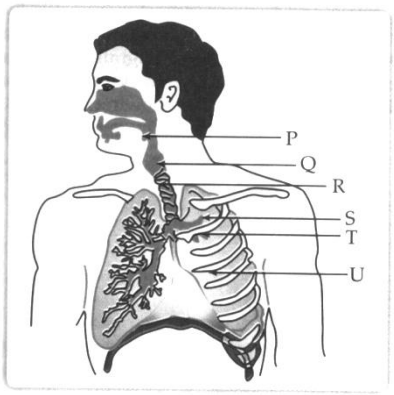
c. Lymph d. Proteins

4. Which part of the nephron in human kidney , serves the function of reabsorption of certain substances?

a. Glomerulus b. Bowman's Capsule

c. Tubules d. Collecting duct

IV. Study the diagram of human respiratory system and answer any of the four questions 1. to 5



1. The balloon like structures present in 'S' is:

a. Nephron **b. Alveoli** c. Bronchi d. Bronchiole

2. Which of these organ is surrounded by cartilaginous rings?

a. P b. Q **c. R** d. S

3. Which of these statement is incorrect regarding human lungs?

a. It is the secondary organ for respiration.

b. It is located on the two sides of heart.

c. The membrane that encloses lungs is pleural membrane.

d. The alveolar epithelium of lungs is non-ciliated epithelium.

4. Trachea is divided into two smaller tubes called _____.

a. Bronchi b. Bronchioles c. Larynx d. Alveoli

5. Which of these is the function of balloon like structure present in lungs?

a. Exchange of gases

b. Absorption of nutrients.

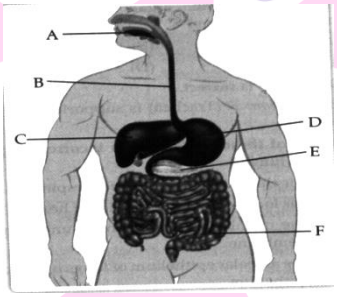
c. Transport of food

d. Removal of waste materials.

Case Based Subjective Questions

I. Read the passage and answer the following questions.

The given diagram is of human digestive system. The human's digestive system is made up of the gastrointestinal (GI) tract and liver, pancreas and gallbladder . The GI tract is a series of hollow organs that are connected to each other from your mouth of your anus. The organs that make up your GI tract, in the order that they are connected , include your mouth, oesophagus, stomach, small intestine, large intestine and anus . Study the diagram and answer the questions given below:



1. Identify the labels B,C,D and E.
2. What are the final product after digestion of carbohydrates and proteins?
3. Name the secretion that is released by label C. How it helps in fat digestion.
4. Name the major process in region F, which is no longer occurring normally in case of diarrhoea.

Ans.

1. B-Oesophagus, C-Liver, D-stomach, E-pancreas 1
2. The final product after digestion of carbohydrate and protein is glucose and amino acid.
3. Label C represents liver: Liver secretes bile, which is stored in gall bladder:

Role of bile in fat digestion:

(i) It makes the acidic food alkaline to facilitate the action of enzymes lipase on it.

(ii) Bile salts breakdown fats present in food into small globules for enzymes to act.

4. Absorption of water is not occurring normally in region F (Large intestine).

II. Read the passage and answer the following questions below:

Oxygen- rich blood from the lungs comes to the thin-walled upper chamber of the heart on the left. The left upper chamber (A) then relaxes. It then contracts and blood is allowed to enter the next chamber (B), as it expands. When the muscular left lower chamber of heart contracts the blood is pumped out to the body via aorta.

Deoxygenated blood reaches from the body to the upper chamber on the right side of heart (C) and it expands. As this part contracts, the corresponding lower chamber (D) dilates. This transfers the blood to right ventricle, which in turn pumps it to the lungs for oxygenation.

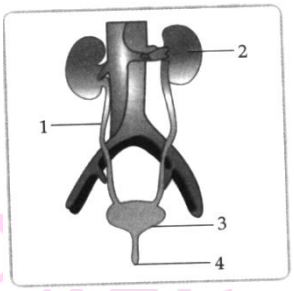
1. Ventricles have thicker muscular walls than atria. Give reason.

   Ans 1. A-Left atrium, B-Left ventricle, C – Right atrium, D-Right ventricle

2. A (Left atrium) and B (Left ventricle) contain oxygenated blood from lungs.
3. Arteries:
   (i) Arteries carry oxygenated blood , away from the heart except pulmonary artery.
   (ii) These are thick-walled, highly muscular except arteries of cranium and vertebral column.
   (iii) Valves are absent.
   (iv) Blood in veins moves under very low pressure.
4. Ventricle have to pump blood forcefully so as to reach even distant capillaries, right ventricle into lungs and left ventricle to all the remaining body parts, while atria are to pump blood into adjacent ventricles.

III. Read the passage and answer the following questions below:

The excretory system is responsible for the elimination of wastes produced by homeostasis. There are several parts of the body that are involved in this process, such as sweat glands , the liver, the lungs and the kidney system. Every human has two kidneys. The given diagram represents the structure of a human excretory system. Study the diagram and answer the following questions.



1. What is the role of part 1 in excretion?
2. Name the structural and functional part of 2?
3. What will happen , if one kidney of a person is removed?
4. The urge to urinate can be controlled . Give reason.

Ans.1. part 1 is urinate. It transport urine from kidney to urinary bladder.

1. Nephron.
2. If one kidney of a person is removed, he can still survives and remains normal because of same function performed by the other kidney.
3. As the bladder is muscular , it is under the control of nervous system. Hence, we can control the urge to urinate to some extent.