

**Solution**  
**Class 10 - Science**  
**Chapter – 6 Life processes (Duplicate)**

**Section A**

1. **(c)** Glycerine  
**Explanation:** Glycerine is used to temporarily mount the specimen as it prevents the specimen from drying.
2. **(d)** Destarched potted plant  
**Explanation:** The experiment is done to test the presence of starch.
3. **(c)** safranin  
**Explanation:** Safranin is pinkish red in colour.
4. **(d)** nephrons  
**Explanation:** A nephron is a tissue, which is the basic structural and functional unit of the kidney. Its chief function is to regulate the concentration of water and soluble substances like sodium salts by filtering the blood, reabsorbing what is needed and excreting the rest as urine.
5. **(b)** excretion  
**Explanation:** Excretion is the process by which metabolic wastes and other non-useful materials are eliminated from an organism. In Human beings, kidneys are the organs that filter waste products from the blood. Therefore, Kidneys are the part of the excretory system.
6. **(c)** Small intestine  
**Explanation:** Although the primary digestion process is conducted in the mouth and stomach. Most of the digestion process occurs in the small intestine and in large intestine digestion process will not take place.
7. **(b)** KOH  
**Explanation:** The leaf has to be boiled in alcohol in a water bath and to be tested with iodine for starch.
8. **(a)** Both A and B  
**Explanation:** Uncovered portion of the leaf is exposed to the light and photosynthesis reaction takes place there.  
$$6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{H}_2\text{O} + 6\text{O}_2$$
9. **(a)** alveoli of lungs  
**Explanation:** Trachea, Larynx provide a passage for the movement of air. Gas exchange takes place in alveoli of the lungs. From alveoli, oxygen diffuses into the blood, and carbon-di-oxide exhaled out of the blood.
10. **(d)** Glucose  $\xrightarrow{\text{cytoplasm}}$  pyruvate + Energy  $\xrightarrow{\text{mitochondria}}$   $\text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$   
**Explanation:** In aerobic respiration breakdown of pyruvate takes place in mitochondria.  $\text{CO}_2$ ,  $\text{H}_2\text{O}$  and energy are released in the reaction.
11. **(b)** Potassium hydroxide  
**Explanation:** Potassium hydroxide absorbs carbon dioxide which is released during respiration.
12. **(a)** dialysis  
**Explanation:** Dialysis is a process used for purifying blood by removing waste and excess fluid from the body. When the kidneys don't work properly, dialysis is used to perform the function of the kidneys. Dialysis is a treatment that filters and purifies the blood using a machine.
13. **(a)** A  
**Explanation:** Stomatal pore is grounded by guard cell.
14. **(a)** Valves in heart  
**Explanation:** The heart contain two major valves - the tricuspid valve between the right atrium and the right ventricle; and the bicuspid valve, between the left atrium and the left ventricle. The valves allow the

unidirectional flow of blood from the respective atrium to the ventricle, in case of contraction of the atrial chamber. However, when the ventricles are contracting, the valves close and prevent the backflow of blood into the atria from the ventricles.

15. **(c)** Conversion of pyruvate to lactic acid

**Explanation:** Breakdown of Pyruvate in the presence of oxygen takes place in mitochondria leading to the formation of Lactic acid. The workout oxygen is used for the production of energy leading to the lack of oxygen and production of lactic acid.

16. **(b)** Rectum

**Explanation:** The small intestine comprises of three divisions - the proximal duodenum, the middle jejunum, and the distal ileum. The rectum, although a part of the gastrointestinal tract, begins after the large intestine ends. Hence, it is not a part of the small intestine.

17. **(d)** (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)

**Explanation:**

- The epiglottis is a flap made of elastic cartilage covered with a mucous membrane. It opens during breathing, allowing air into the larynx. During swallowing, it closes to prevent aspiration, forcing the swallowed liquids or food to go down the esophagus instead. It is thus the valve that diverts passage to either the trachea or the esophagus.
- Platelets are the cells that circulate within our blood and bind together when they recognize damaged blood vessels. When you get a cut, for example, the platelets bind to the site of the damaged vessel, thereby causing a blood clot.
- Electrocardiograph (Cardiograph) is an instrument used in the detection and diagnosis of heart abnormalities that measures electrical potentials on the body surface and generates a record of the electrical currents associated with heart muscle activity.
- A sphygmomanometer, also known as a blood pressure meter, blood pressure monitor, or blood pressure gauge, is a device used to measure blood pressure, composed of an inflatable cuff to collapse and then release the artery under the cuff in a controlled manner, and a mercury or mechanical manometer to measure the pressure.

18. **(d)** Iodine

**Explanation:** Iodine makes starch blue-black.

19. **(d)** Tadpole

**Explanation:** A tadpole lives underwater so it only has one way of gas exchange (through the gills). First, the tadpoles open their mouth to let water enter. Then, the water moves into the gills which contain small membranes called lamella.

20. **(d)** transport of water

**Explanation:** Xylem, plant vascular tissue that conveys water and dissolved minerals from the roots to the rest of the plant and also provides physical support. Xylem tissue consists of a variety of specialized, water-conducting cells known as tracheary elements, which help it to transport water throughout the plant.

21. **(d)** blue-black in colour

**Explanation:** Iodine when added to starch gives blue-black colour.

22. **(c)** Pulmonary artery

**Explanation:** The pulmonary arteries carry deoxygenated blood from the right ventricle to the lungs. The pulmonary veins carry oxygenated blood from the lungs to the left atrium.

23. **(c)** (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)

**Explanation:**

- Blood is red because of the hemoglobin inside our red blood cells. Hemoglobin is a protein that forms a complex with iron molecules and together they transport oxygen molecules throughout the body
- Chlorophyll is the molecule that absorbs sunlight and uses its energy to synthesize carbohydrates from CO<sub>2</sub> and water. This process is known as photosynthesis.
- The liver is the largest gland in the human body. It is also the largest (internal) organ in our body and can weigh up to 1.5 kg for a human adult.

- The purpose of the heart is to pump blood to the organs and tissues of your body that need the oxygen and nutrients it carries.

24. **(d)** Mouth → oesophagus → stomach → small intestine → large intestine

**Explanation:** The human alimentary canal consists of organs of digestion which are in the sequence as follows:

Mouth → oesophagus → stomach → small intestine → large intestine

25. **(c)** to absorb carbon dioxide released by germinating seeds

**Explanation:** The function of KOH in the experimental set-up to show that CO<sub>2</sub> is released during respiration is to absorb carbon dioxide released by germinating seeds.

26. **(c)** Nostrils → pharynx → larynx → trachea → alveoli

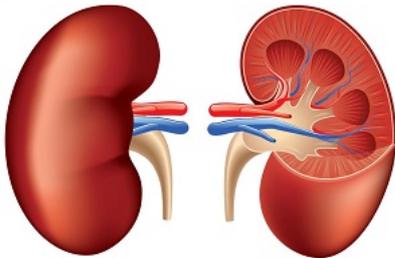
**Explanation:** Air enters the respiratory system through nostrils passes to pharynx, larynx, trachea, and then to alveoli. After inhalation diaphragm and intercostal muscles contract along with the expansion of thoracic muscles which creates enough space for the air to enter into the lungs.

27. **(b)** Plasma

**Explanation:** Carbon dioxide and nitrogen wastes transported through the blood by dissolving in plasma in water-soluble simpler molecular form, as CO<sub>2</sub> can dissolve with the nitrogen wastes or bind easily with the plasma proteins.

28. **(d)** It is bean shaped

**Explanation:** The kidneys are a pair of bean-shaped organs on either side of your spine, below your ribs and behind your belly. Each kidney is about 4 or 5 inches long, roughly the size of a large fist. The kidneys' job is to filter your blood.



29. **(b)** Starch breaking down into sugars

**Explanation:** Salivary amylase enzyme present in the saliva breaks down starch into simpler sugar and helps in digesting them. Hence, the breakdown of starch will be affected if salivary amylase is lacking in the saliva.

30. **(d)** Carbon dioxide

**Explanation:** Because of respiration, Carbon dioxide gets accumulated in tissues. Hence, blood leaving the tissues becomes richer in Carbon dioxide.

31. **(c)** Proteins

**Explanation:** Protein digestion starts in the stomach. Protein digestion occurs in the stomach and duodenum in which 3 main enzymes, pepsin secreted by the stomach and trypsin and chymotrypsin secreted by the pancreas, break down food proteins into polypeptides that are then broken down by various exopeptidases and dipeptidases into amino acids.

32. **(d)** Fatty acid, glycerol

**Explanation:** Lipids (fats and oils) get digested with the help of a lipase enzyme and gives fatty acids and glycerol as a product.

33. **(c)** stomata surrounding by a pair of guard cells each

**Explanation:** Onion peel possesses stomata, guard cells, and epidermal cells. The nuclei are present in both epidermal and guard cells. Stomata is a pore surrounded by guard cells, so it does not possess any nucleus.

34. **(d)** Wind velocity

**Explanation:** Wind velocity doesn't affect the photosynthesis. Unlike light intensity, CO<sub>2</sub> concentration, and

temperature which are the major factors influencing the rate of photosynthesis, the wind has no effect on the reactions and the rate of reactions going in the chloroplast of the leaves of the plant.

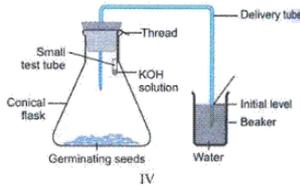
35. **(b) Water**

**Explanation:** During photosynthesis, water molecule splits to produce Oxygen and Hydrogen ions. Oxygen is expelled out of plants and Hydrogen is used to reduce Carbon-di-oxide to produce carbohydrates.

36. **(c) Aerobic respiration**

**Explanation:** Aerobic cell respiration (glycolysis + the Krebs cycle + respiratory electron transport) produces 36 ATP/glucose consumed. Aerobic cell respiration is roughly 18 times more efficient than anaerobic cell respiration. Your cells require a lot of energy and are dependent on the high efficiency of aerobic respiration.

37. **(a) IV**



**Explanation:**

This is the correct set-up

38. **(c) Starch**

**Explanation:** Starch is made up of two components **Amylose** and **Amylopectin**. When we add iodine to starch-containing water Amylose reacts with iodine to form a blue colour complex. Here solution gives blue-black colour on adding iodine which confirms the presence of starch in the rice water.

39. **(c) Mucus**

**Explanation:** A layer of mucus along the inner walls of the stomach is vital to protect the cell linings of that organ from the highly acidic environment within it.

40. **(d) (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)**

**Explanation:**

- Insects, and some other invertebrates, exchange oxygen and carbon dioxide between their tissues and the air by a system of air-filled tubes called tracheae. Tracheae open to the outside through small holes called spiracles.
- Earthworms need oxygen just like humans, but they don't have lungs. They have a special skin that allows them to "breathe" oxygen right through it.
- Most fish exchange gases using gills on either side of the pharynx (throat). Gills are tissues that consist of threadlike protein structures called filaments. These filaments have many functions including the transfer of ions and water, as well as the exchange of oxygen, carbon dioxide, acids, and ammonia.
- The lungs are the primary organs of the respiratory system in mammals.

41. **(c) Brush**

**Explanation:** To avoid damage of the peel, we generally used brush.

42. **(b) Out of the cell**

**Explanation:** If a cell is placed in a solution having a solute concentration higher (hypertonic) than that of the cell water from the cell will move into the solution through the exosmosis.

43. **(a)  $6\text{CO}_2 + 12\text{H}_2\text{O} + \text{Chlorophyll} + \text{Sunlight} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$**

**Explanation:** The summary equation of photosynthesis is



Photosynthesis is a process by which green plants make their own food, e.g., glucose.  $\text{CO}_2$  and  $\text{H}_2\text{O}$  in the presence of sunlight energy and chlorophyll in the presence of Oxygen gas is released during the process of photosynthesis.

44. **(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.**

**Explanation:** Transpiration is a necessary evil. It is so because water is lost in the form of vapours from the aerial parts of the plant through transpiration. But, it helps in the absorption and upward movement of water and minerals creating transpiration pull.

45. **(c)** Assertion is correct statement but reason is wrong statement.  
**Explanation:** Digestion breaks large complex organic molecules to simple smaller ones which can be easily absorbed. However, certain molecules such as glucose, vitamin C etc, do not need any digestion before their absorption.
46. **(a)** Assertion and reason both are correct statements and reason is correct explanation for assertion.  
**Explanation:** The alveoli of lungs are richly supplied with blood and are the sites where exchange of gases (O<sub>2</sub> and CO<sub>2</sub>) occurs between blood and atmosphere.
47. **(b)** Assertion and reason both are correct statements but reason is not correct explanation for assertion.  
**Explanation:** There is no mixing of oxygenated and deoxygenated blood due to the presence of inter-auricular and interventricular septum. On the other hand, valves are present in the heart which allows the movement of blood in one direction only.
48. **(c)** Assertion is correct statement but reason is wrong statement.  
**Explanation:** Photosynthesis is an anabolic process as it takes CO<sub>2</sub> and H<sub>2</sub>O then assembles them into glucose. The process of photosynthesis occurs in chloroplast.

**Section B**

49. i. (d) Right auricle → Right ventricle → Lungs → Left auricle → Left ventricle

ii.		carries blood to body	carries blood to lungs	carries blood from lungs	carries blood from body
(d)	3	1	4	2	

- iii. (a) Aorta  
 iv. (b) Haemoglobin  
 v. (a) Left auricle and left ventricle