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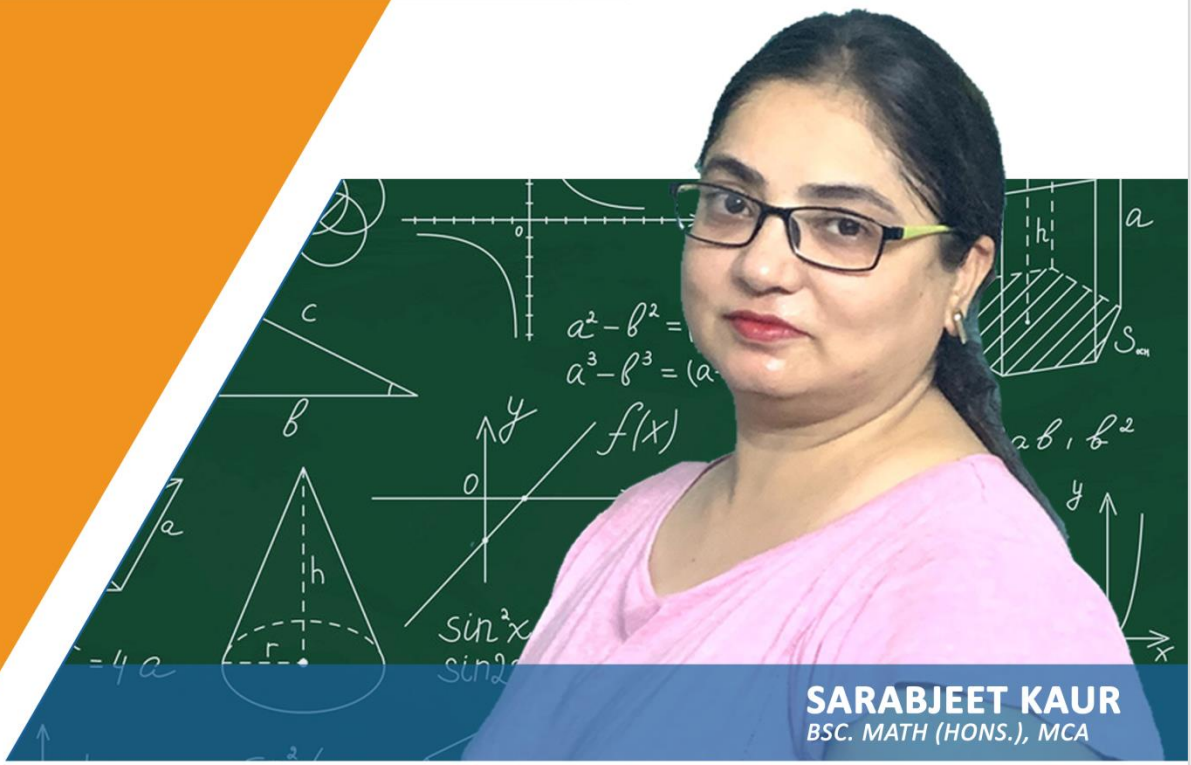

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GRADE 10TH SCIENCE

CHAPTER 6

LIFE PROCESSES

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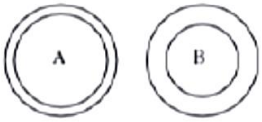
2

Read the following and answer any four questions from 2(i) to 2(v).

Given are the sections of two pipes, A and B. If you need to represent blood vessels with these, which of the pipes would correspond to the artery and which one to a vein. Identify it and answer the following questions.



(i) B is best defined as the vessel which
- (a) always supply oxygenated blood to the different organs
- (b) always carry blood away from the heart to different organs
- (c) always break up into capillaries that reunite to form a vein
- (d) always carry blood from one visceral organ to another visceral organ.

(ii) In A, valves are present to check backward flow of blood flowing at
- (a) atmospheric pressure
- (b) high pressure
- (c) low pressure
- (d) all of these.

(iii) Which of the following statements is correct regarding A?
- (a) Carries blood from an organ towards the heart
- (b) Always carry oxygenated blood with single exception
- (c) Carries blood from heart towards the organ
- (d) All of these

(iv) Which of the following statements is incorrect?
- (a) A has typically larger lumen than B.
- (b) Walls of B are elastic enabling them to stretch and shrink during changes in blood pressure.
- (c) Flow of blood is slower in A than in B.
- (d) None of these

(v) Blood pressure in the pulmonary artery is
- (a) more than that of pulmonary vein
- (b) less than that in the vena cava
- (c) same as that in aorta
- (d) less than pulmonary vein.

3

Read the following and answer any four questions from 3(i) to 3(v).

Our body needs to remove the wastes that build up from cell activities and from digestion. It these wastes are not removed, then our cells can stop working and we can get very sick. The organs of our excretory system help to release wastes from our body. The excretory system consists of a pair of kidney, a pair of ureters, a urinary bladder and a urethra. Each kidney is made up of nearly one million complex tubular structures called nephrons. The formation of urine involves various processes that takes place in the different parts of the nephron. Each nephron consists of a cup-shaped upper end called Bowman's capsule containing a bunch of capillaries called glomerulus. Bowman's capsule leads to tubular structure-proximal convoluted tubule, loop of Henle and distal convoluted tubule which ultimately joins the collecting tubule.

(i) The following substances are the excretory products in animals. Choose the least toxic form.

(a) Urea (b) Uric acid (c) Ammonia (d) CO_2

(ii) The outline of principal events of urination is given below in random manner.

(I) Stretch receptors on the wall of urinary bladder send signals to the CNS.

(II) The bladder fills with urine and becomes distended.

(III) Micturition

(IV) CNS passes on motor messages to initiate the contraction of smooth muscles of bladder and simultaneous relaxation of urethral sphincter.

The correct sequence of the events is

(a) (I) → (II) → (III) → (IV) (b) (IV) → (III) → (II) → (I)

(c) (II) → (I) → (IV) → (III) (d) (III) → (II) → (I) → (IV).

(iii) A person who is not taking food or beverages will have _____ in urine.

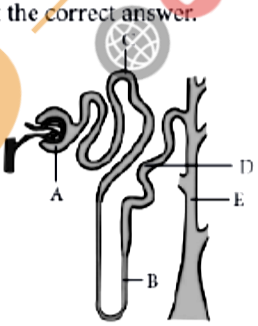
(a) little glucose (b) less urea (c) excess urea (d) little fat

(iv) Glomerular filtrate is first collected by

(a) distal convoluted tubule (b) proximal convoluted tubule

(c) Bowman's capsule (d) loop of Henle.

(v) The given figure represents a single nephron from a mammalian kidney. Identify the labelled parts, match them with the options (i-iv) and select the correct answer.



(I) The site of ultrafiltration

(II) Collect the urine and make it more concentrated

(III) The main site for the reabsorption of glucose and amino acids

(IV) Largely responsible for the maintenance of blood pH

(a) (I)-A, (II)-E, (III)-C, (IV)-D (b) (I)-A, (II)-B, (III)-C, (IV)-D

(c) (I)-B, (II)-A, (III)-C, (IV)-E (d) (I)-E, (II)-B, (III)-D, (IV)-A

4

Read the following and answer any four questions from 4(i) to 4(v).

All living cells need nutrients, O_2 and other essential substances. Also, the waste and harmful substances need to be removed continuously for healthy functioning of cells. So, a well developed transport system is mandatory for living organisms. Complex organisms have special fluids within their bodies to transport such materials. Blood is the most commonly used body fluid by most of the higher organisms. Lymph also helps in the transport of certain substances.

(i) Which of the following does not exhibit phagocytic activity?
(a) Monocytes (b) Neutrophils (c) Basophil (d) Macrophage

(ii) Amount of blood corpusles in changed in dengue fever. One of the common symptoms observed in people infected with dengue fever is
(a) significant decrease in RBC count
(b) significant decrease in WBC count
(c) significant decrease in platelets count
(d) significant increase in platelets count.

(iii) Why are WBCs called soldiers of the body?
(a) They are capable of squeezing out of blood capillaries.
(b) They are manufactured in bone marrow.
(c) They fight against disease causing germs.
(d) They have granular cytoplasm with lobed nucleus.

(iv) Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body.
(a) Erythrocytes (b) Neutrophils (c) Leucocytes (d) Thrombocytes

(v) Which of the following is the correct feature of lymph?
(a) It is similar to the plasma of blood, but is colourless and contains less proteins.
(b) It is similar to the WBCs of blood, but is colourless and contain more proteins.
(c) It is similar to the RBCs of blood and red in colour.
(d) It contains more fats.

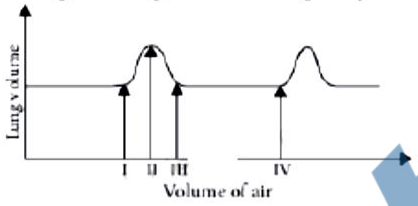
5

Read the following and answer any four questions from 5(i) to 5(v).

We need energy to perform various activities. This energy is derived from the catabolism of various components of food, e.g., proteins, carbohydrates, fats, etc. Oxygen is required for catabolic processes and carbon dioxide is released in the process. So, the body requires a continuous exchange of gases, oxygen from the atmosphere is taken inside and carbon dioxide produced is given out. In human beings, respiratory pigment called haemoglobin present in RBCs has very high affinity for oxygen. In tissues, exchange of gases occurs between oxygenated blood and tissue cells.

(i) People living at sea level have around 5 million RBCs per cubic millimetre of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude
(a) people eat more nutritive food, therefore more RBCs are formed
(b) people get pollution-free air to breathe and more oxygen is available
(c) atmospheric O_2 level is less and hence more RBCs are needed to absorb the required amount of O_2 to survive
(d) there is more UV radiation which enhances RBC production.

(ii) The given graph illustrates the changes in lung volume during the process of breathing.



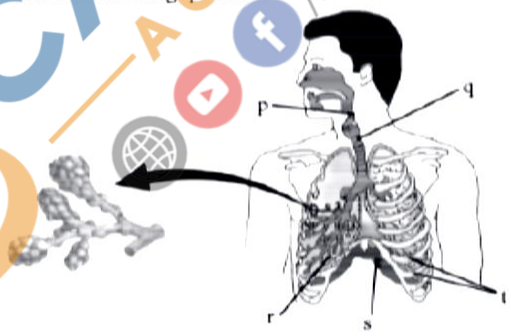
The change from II to III indicates the

(a) movement of diaphragm away from the lungs
(b) expansion of the thoracic cavity
(c) movement of air out of the lungs
(d) expansion of ribs.

(iii) Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?

(a) One can breathe out air totally without oxygen.
(b) One can breathe out air through Eustachian tube by closing both nose and mouth.
(c) One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all.
(d) The lungs can be made fully empty by forcefully breathing out all air from them.

(iv) Refer to the given figure and answer the following question.



Which of these parts

(I) are the actual sites of respiratory gas exchange?
(II) is the common passage for air and food?
(III) is provided with incomplete cartilaginous rings?
(IV) relaxes and gets back to its original shape during expiration?
(v) moves upwards and outwards during inspiration?

(a) (I) – s, (II) – p, (III) – q, (IV) – r, (V) – t
(b) (I) – r, (II) – p, (III) – q, (IV) – s, (V) – t
(c) (I) – t, (II) – q, (III) – r, (IV) – s, (V) – p
(d) (I) – p, (II) – q, (III) – r, (IV) – s, (V) – t

(v) Which of the following sequences is correct to initiate inspiration?

(I) The contraction of intercostal muscles raises the ribs and sternum
(II) Volume of thorax increases
(III) Intrathoracic pressure of the lungs decreases
(IV) Diaphragm contraction
(v) Air rushes into lungs

(a) (I), (II), (IV), (V), (III)
(b) (I), (II), (III), (IV), (V)
(c) (I), (IV), (II), (III), (V)
(d) (V), (I), (II), (III), (IV)

6

Read the following and answer any four questions from 6(i) to 6(v).

The green plants make their food, through photosynthesis and are therefore called autotrophs. All other organisms depend upon green plants for food and are referred to as heterotrophs. Green plants carry out photosynthesis by using light energy of sun. The first phase of reactions are directly light driven therefore called light reactions. The second phase of reactions are not directly light driven but are dependent on the products of light reactions and are called dark reactions.

(i) Which of the following is produced during the light phase of photosynthesis?
(a) ATP (b) NADPH (c) Carbohydrate (d) Both (a) and (b)

(ii) In the overall process of photosynthesis, the number of sugar molecules produced is
(a) 12 (b) 6 (c) 4 (d) 1.

(iii) A plant is provided with ideal conditions for photosynthesis and supplied with isotope $^{14}CO_2$. When the products of the process are analysed carefully, what would be the nature of products?
(a) Both glucose and oxygen are normal.
(b) Both glucose and oxygen are labelled.
(c) Only glucose is labelled and oxygen is normal.
(d) Only oxygen is labelled and glucose is normal.

(iv) Refer to the given diagrammatic representation of an electron micrograph of a section of chloroplast and answer the question.

Select the option which correctly depicts the functions of parts X, Y and Z.

	X	Y	Z
(a)	Dark reaction	Light reaction	Carbohydrate synthesis
(b)	Light reaction	Carbohydrate synthesis	Carbohydrate storage
(c)	Light reaction	Carbohydrate storage	Carbohydrate synthesis
(d)	Carbohydrate synthesis	Carbohydrate storage	Cytoplasmic inheritance

(v) Following table summarises the differences between light and dark reactions.

	Light reactions	Dark reactions
(I)	These are also called biosynthetic phase.	These are also called photochemical phase.
(II)	These reactions occur over thylakoids.	These reactions occur in stroma of chloroplasts.
(III)	These produce assimilatory power *i.e.*, NADPH and ATP.	These consume NADPH and ATP.
(IV)	These are directly dependent upon light.	They depend upon the products synthesised during light reactions.

Which of the following is correct group of differences?
(a) (I), (II) and (III) (b) (II), (III) and (IV)
(c) (II) and (III) (d) (I) and (IV)