Life Processes

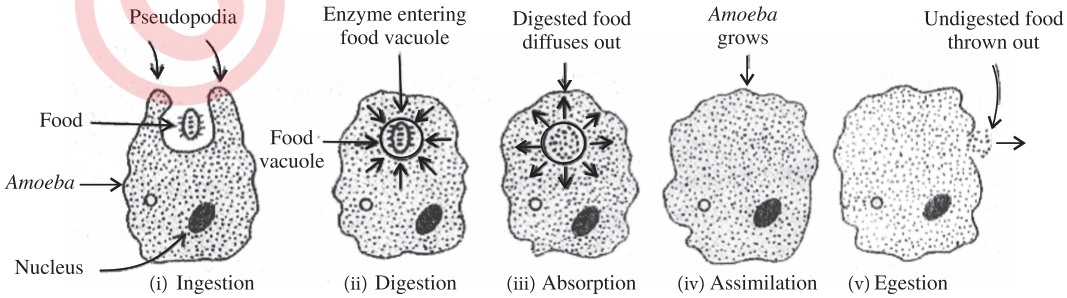
CHAPTER 6

TRY YOURSELF ANSWERS

1. Chloroplast acts as the site of photosynthesis.
2. The overall reaction of photosynthesis is as follows :

$$6CO_2 + 12H_2O \xrightarrow[\text{Solar energy}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6H_2O + 6O_2\uparrow$$

3. Two phases occurring during photosynthesis are : Light phase and dark phase.
   Light phase takes place in grana region of chloroplast and dark phase takes place in stroma region of chloroplast.
4. Reduction of carbon dioxide occurs during dark phase or light independent phase of photosynthesis.
5. Plants are necessary for the life on this earth. They perform photosynthesis during which O_2 is released in the atmosphere. This O_2 is utilised by other organisms during respiration. In the absence of O_2, life on earth will be adversely affected. Further, they provide food to other organisms for their survival. Herbivores depend on plants for their food and carnivores depend on herbivores. Thus, directly or indirectly all organisms depends upon plants. Therefore, in the absence of green plants all the organisms will die.
6. Roundworms and ticks are parasites which live either on or inside the body of other organisms to obtain their nutrition without killing them.
7. Heterotrophic nutrition is the mode of nutrition in which an organism cannot make its own food from simple inorganic materials and depends on other organisms for its food.
8. Organisms which derive nutrition from dead and decaying plants and animals are called saprotrophs. Moulds, mushroom, yeast and bacteria are saprotrophs.
9. Pseudopodia
10. The mode of nutrition in *Amoeba* in holozoic. The process of obtaining food by *Amoeba* is called phagocytosis. *Amoeba* ingests food by using its finger like projections called pseudopodia. The food is engulfed with a little surrounding water to form a food vacuole inside the *Amoeba*. The food is digested inside food vacuole by digestive enzymes. Food is absorbed directly into the cytoplasm of *Amoeba* by diffusion. Food is used to obtain energy and growth of *Amoeba*. When considerable amount of undigested food collects inside *Amoeba* then its cell membrane ruptures at any place to throw out this undigested food.
    Diagrammatic representation of different stages in the nutrition in *Amoeba* is as follows :



11. Although shorter in length, large intestine is called so because it is wider in diameter than small intestine.
12. Carnivores has shorter small intestine than herbivores. This is because meat is digested easily as compared to cellulose which is difficult and takes time to digest.
13. Hydrochloric acid (HCl) present in our stomach kills the bacteria ingested with food. It creates an acidic medium of pH about 2 pH, facilitating the action of pepsin enzyme.
14. Chyme is the semi-solid and partly digested food that is discharged from the stomach into the duodenum.

15. The lining of the alimentary canal has muscles which contract rhythmically in order push food forward. These movements are called peristaltic movements.

16. Inspiration and expiration

Differences between breathing and respiration are as follows :

S. No.	Breathing (External)	Respiration (Internal)
(i)	It is simply an inhalation of fresh air and exhalation of foul air.	It is an oxidation of food to form CO_2, H_2O and energy.
(ii)	It is a physical process.	It is a biochemical process.
(iii)	No energy is released, rather used.	Energy is released in the form of ATP.
(iv)	It occurs outside the cell, hence it is an extra-cellular process.	It is an intracellular process.
(v)	No enzymes are involved in this process.	Large number of enzymes are involved.
(vi)	It is confined to certain organs.	it occurs in all the living cells of the body.
(vii)	Specialised respiratory organs or cell membrane are involved.	Involves cytosol and mitochondria.

18. Zymase

19. Energy currency of living organisms is adenosine triphosphate (ATP). It is produced in the plants during light phase of photosynthesis and respiration while in animals, ATP is formed during respiration. The energy released during respiration is used to make ATP from ADP and inorganic phosphate, ADP + Pi $\rightarrow$ ATP.

20. The first step in energy production is the oxidation of glucose, a 6-carbon molecule into a 3-carbon molecule called pyruvate, by a process called glycolysis. It occurs in the cytoplasm. The fate of pyruvate depends upon the presence or absence of oxygen. Pyruvate may be converted into ethanol and carbon dioxide in the absence of oxygen. This process takes place in yeast during fermentation. It is called anaerobic respiration. During aerobic respiration, *i.e.*, in presence of oxygen, pyruvate breaks up into carbon dioxide and water using oxygen. The process takes place in mitochondria.

21. Muscle cramps occur due to the sudden accumulation of lactic acid in muscles when the muscles respire anaerobically while doing hard physical exercise.

22. Lenticel

23. The land plants die if their roots remain waterlogged for a considerable time because too much water expels all the air from in-between the soil particles. Due to this, oxygen is not available to the roots for aerobic respiration. Under these conditions, the roots will respire anaerobically, producing alcohol. This may kill the plant.

24. The net gas exchange in leaves during day time is : O_2 diffuses out and CO_2 diffuses in.

25. Alveoli

26. A breath means one inhalation plus one exhalation.

27. **(d) :** Breathing is a mechanical process which involves 2 steps :

(i) Inhalation - It is the process of intaking fresh atmospheric air into the lung alveoli. It involves contraction of respiratory muscles due to which ribs moves upward and outward and diaphragm gets lowered and becomes flat. These movements cause increase in thoracic cavity.

(ii) Exhalation - It is a passive process and involves decrease in the size of the thoracic cavity.

The alveoli or air sacs are richly supplied with blood vessels. The oxygen present in the air we breathe in, enters into the blood contained in the alveolar capillaries. The carbon dioxide present in the blood passes out of the blood into the air sacs. Thus, exchange of gases takes place in the alveoli of the lungs.

Haemoglobin has greater affinity for oxygen than carbon dioxide, so it carries much amount of available oxygen in the blood after exchange. Alveoli provides large surface area for gaseous exchange.

28. Unlike unicellular organisms, in higher multicellular forms including man, every cell of the body is not in direct contact with the external environment. Only the surface layer cells of skin are exposed to the surrounding environment. On the other hand, diffusion is a slow process so cell to cell diffusion is not a good way to provide oxygen to all the cells. So, exchange of gases by diffusion is not possible in multicellular organisms. Thus, multicellular organisms require certain specialised organs for breathing, exchange of gases and transport of gases to meet the oxygen requirement.

29. Terrestrial organisms consume atmospheric oxygen, while aquatic organisms thrive on the dissolved oxygen present in water. Air contains about 21% of oxygen while water has less than 1% oxygen in dissolved state. Oxygen diffuses through water at a much slower rate as compared to air. Thus, a terrestrial organism has the advantage of utilising greater amount of oxygen at a faster rate with lesser effort whereas aquatic organisms have to exert more effort to obtain the same amount of oxygen.

30. Sphygmomanometer is used to measure blood pressure.

31. Blood circulation in human heart is called double circulation because it follows two separate circulatory pathways :

(i) Pulmonary circulation - Circulation of deoxygenated blood from the right ventricle to the lungs and the return of oxygenated blood from lungs to left atrium is called pulmonary circulation.

(ii) Systemic circulation - Circulation of oxygenated blood from the left ventricle to all body parts and deoxygenated blood from body parts to the right atrium is called systemic circulation.

32. Ventricles have to pump blood into various organs with high pressure so they have thicker muscular walls than atria.

33. Valves are present in veins to ensure that blood do not flow backward, *i.e.*, to allow flow of blood only in one direction. In arteries, blood flows with high pressure in one direction, so valves are not present in arteries.

34. Lymph is a colourless fluid that flows from tissues to heart. It carries digested and absorbed fats from intestine. It also drains excess fluid from extracellular space back into the blood.

35. The loss of water in the form of vapour from the exposed parts of a plant is called transpiration.

36. Transpiration creates transpirational pull in plants and helps in ascent of sap from the root to the aerial parts of the plants. Thus, it helps in the absorption and upward movement of water and minerals in the plant.

37. Transport system in highly organised plants consists of two main components - xylem and phloem.

(i) Xylem : It is responsible for transport of water and minerals and its components are xylem vessels, xylem tracheids, xylem parenchyma and xylem fibres.

(ii) Phloem : It is responsible for transport of food substances and its components are sieve tubes, companion cells, phloem parenchyma and phloem fibres.

38. Cohesion and adhesion forces and transpirational pull force are responsible for development of water column in plants.

39. (i) *Nereis* – Nephridia

(ii) Prawn – Antennary or Green glands

(iii) *Herdmania* – Neural gland

(iv) Snake – Kidney

(v) Starfish – Dermal papulae

40. Differences between egestion and excretion are as follows :

S. No.	Egestion	Excretion
(i)	It is a process of expelling of undigested food out of body.	It is a process of expelling of nitrogenous wastes like urea.
(ii)	The process involves large intestine and anus of digestive system.	The process involves kidneys and other parts of excretory system.
(iii)	It occurs through anus.	It occurs through urinary aperture of urethra.

41. Nephron is the structural and functional unit of kidney.

42. The process of purifying blood by an artificial kidney is called haemodialysis.

43. If one kidney of a person is removed, he can still survive and continue normal functions because the other kidney will increase its filtering capacity to compensate the loss. So, a single kidney is sufficient to excrete the nitrogenous wastes from our body.

44. Kidney dialysis machine acts in the similar way as a normal kidney by regulating the normal concentration of the blood. Urea and excess mineral salts in the body diffuses from patients blood across the selectively permeable walls of the tubules into the dialysis fluid. In this way, working dialysis machine is similar to a normal healthy kidney.

45. In some deciduous plants, the excretory matter is thrown out in the form of fallen leaves.

46. Oxygen is the gas produced during photosynthesis. It is removed through stomata present on leaves and lenticels in stems.

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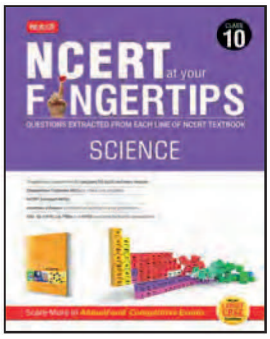

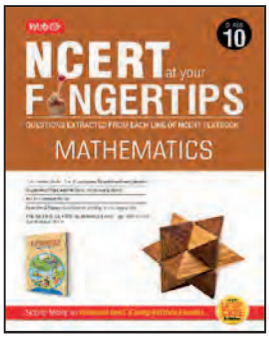

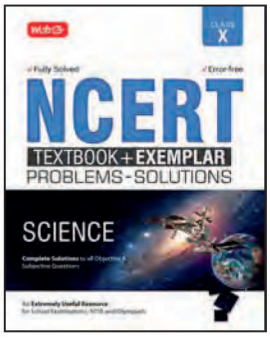

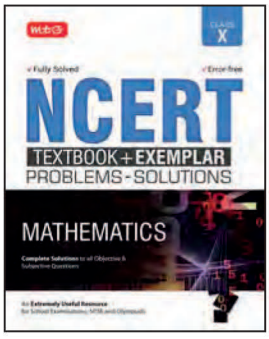

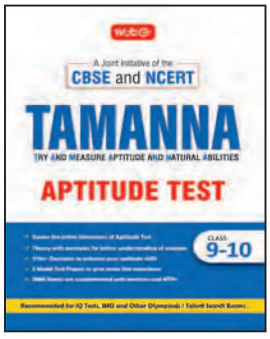

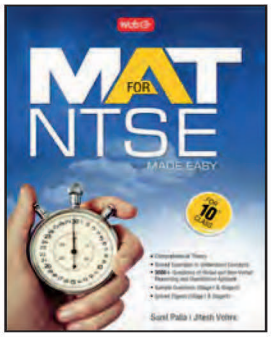

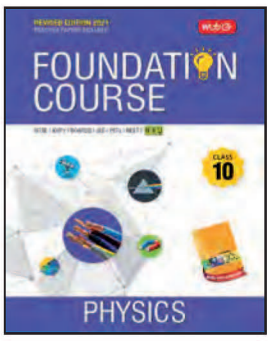

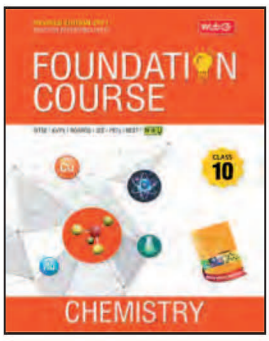

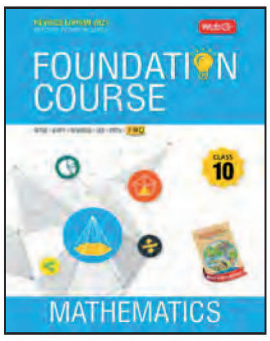

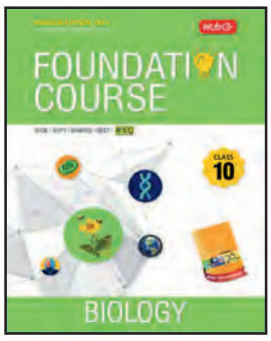

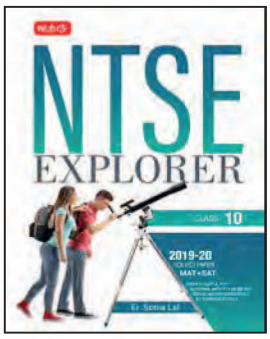

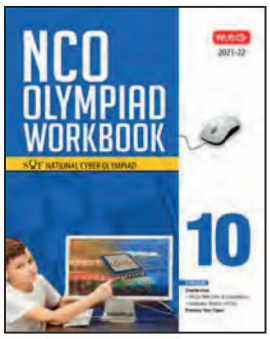

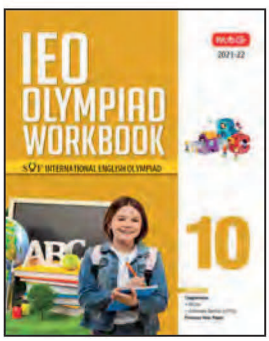

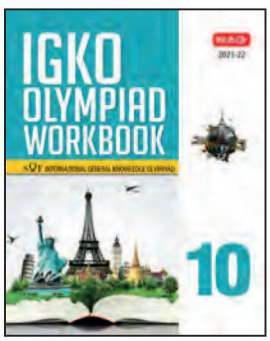

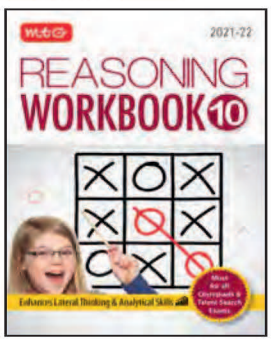

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