

Bihar Board Class 10 Science Solved Question Papers 2019

1. The loss of oxygen from a substance during chemical reaction is called

- (A) Oxidation
- (B) Reduction
- (C) Corrosion
- (D) None of these

Answer: B

2. Food cans are coated with tin, not with zinc because

- (A) Zinc is costlier than tin
- (B) Zinc has a higher melting point than tin.
- (C) Zinc is more reactive than tin
- (D) Zinc is less reactive than tin.

Answer: D

3. Which substance changes colour of Red Litmus in Blue.

- (A) Acid
- (B) Base
- (C) Salt
- (D) None of these

Answer: B

4. Which gas is responsible for the global warming?

- (A) Carbon dioxide
- (B) Oxygen
- (C) Nitrogen

(D) None of these

Answer: A

5. The process of forming a thick oxide layer on aluminum is called

(A) Galvanisation

(B) Anodizing

(C) Enrichment

(D) None of these.

Answer: B

6. How many electrons are there in the outer orbit of an atom of sulphur.

(A) 4

(B) 5

(C) 6

(D) 7

Answer: C

7. How many chambers are present in human heart?

(A) 2

(B) 3

(C) 4

(D) 5

Answers: 4

8. An example of homologous organs are

(A) Our arm and dog's foreleg

- (B) Our teeth and elephant's tusk
- (C) Potato and runners of grass
- (D) All of the above.

Answer: D

9. Which of the following is unsaturated hydrocarbon

- (A) CH_4
- (B) C_2H_6
- (C) C_2H_4
- (D) All of these

Answer: C

10. Which of the following compounds can be used as a fuel?

- (A) Ethanol
- (B) Propanol
- (C) Ethanoic Acid
- (D) All of these

Answer: A

11. The chemical formula for bleaching powder is

- (A) $\text{Ca}(\text{OH})_2$
- (B) CaOCl_2
- (C) CaCO_3
- (D) $\text{Ca}(\text{CHO}_3)_2$

Answer: B

12. On decreasing the number of resistors from a parallel combination of resistors, the total resistors of the new combination of resistors in parallel.

- (A) Increases
- (B) Decreases
- (C) Remains the same
- (D) None of these

Answer: A

13. Which one of the following term represents electric power in circuit?

- (A) I_2R
- (B) IR_2
- (C) V_2I
- (D) VI_2

Answer: A

14. What is the commercial unit of electric energy?

- (A) Watt
- (B) Watt/Hour
- (C) Unit
- (D) None of these

Answer: D

15. Which lens can be used for the correction of hypermetropia?

- (A) Concave Lens

- (B) Convex Lens
- (C) Sometimes concave lens and sometimes concave lens
- (D) Cylindrical lens

Answer: B

16. Which of the following is not a receptor organ?

- (A) Ear
- (B) Eye
- (C) Nose
- (D) Brain

Answer: D

17. The number of group in the modern periodic table is

- (A) 7
- (B) 8
- (C) 9
- (D) 18

Answer: D

18. Which phenomenon of light does the Tyndall effect show?

- (A) Reflection of Light
- (B) Refraction of Light
- (C) Dispersion of Light
- (D) Scattering of Light

Answer: D

19. Which of the following is a malarial parasite?

- (A) Plasmodium
- (B) Leishmania
- (C) Protozoa
- (D) None of these

Answer: A

20. The pH value of pure water is

- (A) 6
- (B) 7
- (C) 8
- (D) 9

Answer: B

21. Which mirror is commonly used as rear-view mirror in vehicles?

- (A) Plane mirror
- (B) Concave mirror
- (C) Convex mirror
- (D) None of these

Answer: C

22. According to Fleming's Left Hand Rule, the index from the left hand side indicates

- (A) Direction of electric force applied on a conductor
- (B) Direction of Magnetic field

- (C) Direction of the flow of electric current in a conductor
- (D) None of these

Answer: B

23. Which of the following is an example of regeneration?

- (A) Hydra
- (B) Amoeba
- (C) Spirogyra
- (D) None of these

Answer: D

24. Which colour has the largest wave-length?

- (A) Red
- (B) Blue
- (C) Yellow
- (D) Violet

Answer: A

25. Which is not responsible for Ganga's pollution?

- (A) Fish Framing in Ganga
- (B) Washing of clothes in Ganga
- (C) Immersion of unburnt corpse in Ganga
- (D) Emission of chemical effluents in Ganga

Answers: A

26. According to New Cartesian sign convention, the object distance of an object placed before a mirror is taken

- (A) Positive
- (B) Negative
- (C) Sometimes positive and sometimes negative
- (D) None of these

Answer: B

27. A rectangular coil of a copper wire is rotated in a magnetic field. The direction of the induced current in the coil changes once in every –

- (A) Two rotations
- (B) One rotations
- (C) Half-rotation
- (D) One-fourth rotation

Answer: C

28. Which of the following carbon compound is the most reactive?

- (A) CH_4
- (B) C_2H_6
- (C) C_2H_4
- (D) C_3H_8

Answer: C

29. Which of the following constitutes a food chain?

- (A) Grass, wheat and mango

- (B) Grass, goat and human
- (C) Goat, cow and elephant
- (D) Grass, fish and goat

Answer: B

30. Which among these do not act as an endocrine gland as well as an exocrine gland?

- (A) Pancreases
- (B) Pituitary Gland
- (C) Ovary
- (D) Testes

Answer: B

31. Which of the following is an ideal source of energy?

- (A) Coal
- (B) Wood
- (C) Petroleum
- (D) Bio-mass

Answer: D

32. Which is a non-biodegradable waste?

- (A) Tissue Paper
- (B) Peel of banana
- (C) Thermocol
- (D) All of these

Answer: C

33. How many atoms of oxygen are there in one molecule of Glucose?

- (A) 4
- (B) 6
- (C) 8
- (D) 12

Answer: B

34. How many bonds are formed between two atoms of hydrogen?

- (A) Single Bond
- (B) Double Bond
- (C) Triple Bond
- (D) None of these

Answer: A

35. The far - point for normal vision is

- (A) 25m
- (B) 25cm
- (C) 25mm
- (D) Infinity

Answer: B

36. Which type of mode of nutrition is found in fungi?

- (A) Saprophytic

- (B) Holozoic
- (C) Autotrophic
- (D) None of these

Answer: A

37. Bile juice is secreted from-

- (A) Pancreases
- (B) Liver
- (C) Small Intestine
- (D) None of these

Answer: B

38. Male reproductive flower is

- (A) Stamen
- (B) Pistil
- (C) Petal
- (D) None of these

Answer: A

39. Which one of the following lenses has positive focal length?

- (A) Concave lens
- (B) Convex lens
- (C) Plano-concave lens
- (D) None of these

Answer: B

40. Which one of the following character is not inheritable?

- (A) Colour of Eye
- (B) Colour of Skin
- (C) Size of Body
- (D) Nature of Hair

Answer: C

SECTION – B (PHYSICS)

1. Why do we prefer a convex mirror as a rear-view mirror in vehicles?

Answer: We prefer a convex mirror as a rear-view mirror in vehicles because it gives a wider field of view, which allows the driver to see most of the traffic behind him. Convex mirrors always form a virtual, erect, and diminished image of the objects placed in front of it.

2. Why is a normal eye not able to see clearly the objects placed closer than 25cm?

Answer: A normal eye is unable to clearly see the objects placed closer than 25 cm because the ciliary muscles of eyes are unable to contract beyond a certain limit.

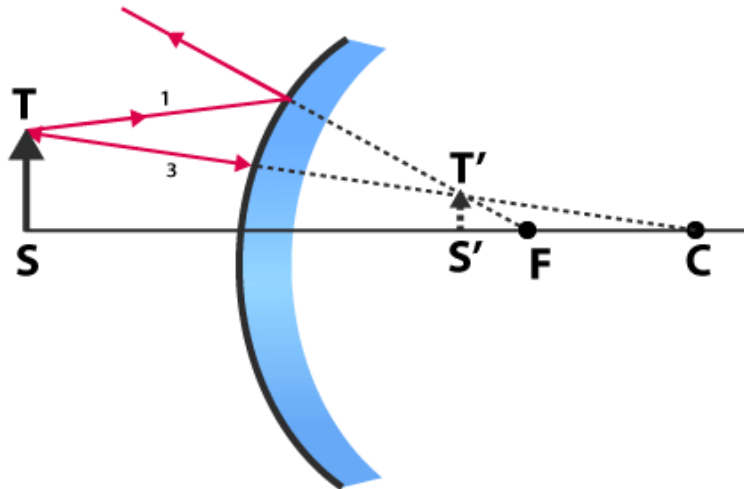
3. Define refractive index? The refractive index of diamond is 2.42. What is the meaning of the statement?

Answer: Refractive index means the ratio of speed of light in vacuum to its speed in a specific medium. The speed of light in a medium depends on the properties of the medium.

The refractive index of diamond is 2.42. This means that the speed of light in diamond will reduce by a factor of 2.42 as compared to its speed in air. In other words, the speed of light in diamond is $1/2.42$ times the speed of light in vacuum.

4. Draw a ray diagram for image of an object placed on the principal axis of a convex mirror. Write the nature, position and size of the image formed by the mirror.

Answer:



Nature – Virtual and Erect
Position – B/W focus and pole.
Size – Diminished

5. What is electric current? Write SI unit of electric current.

Answer: Electric Current is the rate of flow of electrons in a conductor.

$$I = q/t$$

The SI Unit of electric current is the Ampere.

6. An electric lamp with voltage rating 60W; 220V is connected to the main supply of 100V. What current is drawn by the lamp from the main supply?

Answer: $P = V^2/R$

$$60 = 220 \times 220/R$$

$$R = 220 \times 220/60$$

$$V = IR$$

$$110 = I = 220 \times 220/60$$

$$\Rightarrow I = (110 \times 60)/220 \times 220$$

= 3/22 A current is drawn by the lamp from the main supply.

7. What is an earth wire? What is its functions?

Answer: Earth wire is a low resistance wire which connects an appliance to earth so that all the excess current passes to the earth from the wire instead of human body and hence saves from shock.

The main function of the earth wire is to conduct the leaking current from the electrical appliance to the ground. It is connected to the outer metallic body of the appliance.

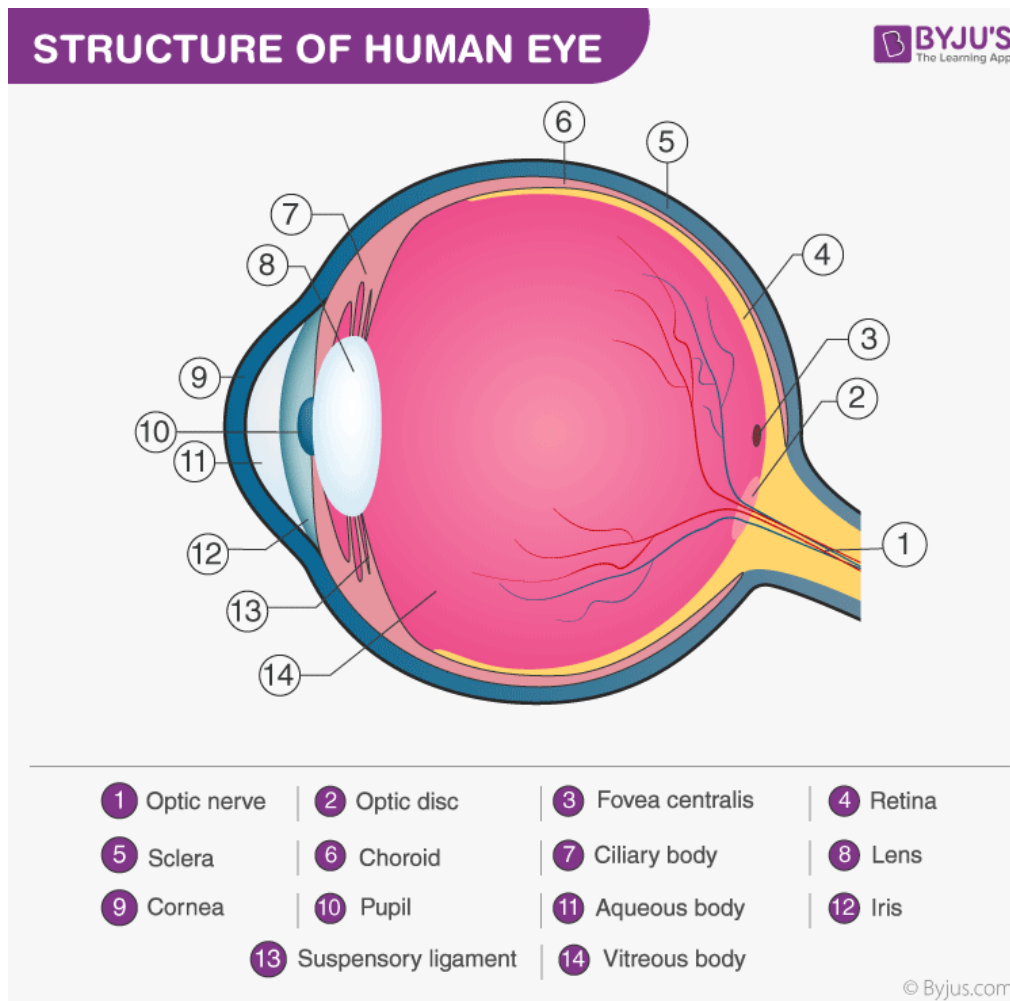
8. Why does the sun appear reddish early in the morning?

Answer: During sunrise, the light rays coming from the Sun have to travel a greater distance in the earth's atmosphere before reaching our eyes. In this journey, the shorter wavelengths of lights are scattered out and only longer wavelengths are able to reach our eyes. Since blue colour has a shorter wavelength and red colour has a longer wavelength, the red colour is able to reach our eyes after the atmospheric scattering of light. Therefore, the Sun appears reddish early in the morning.

9. (a) Draw a well-labelled diagram of human eye.

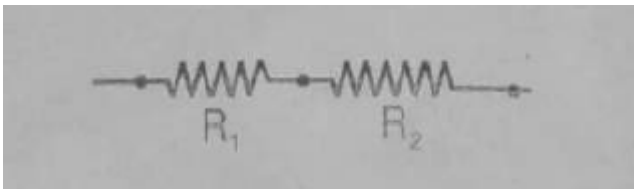
(b) How do ciliary muscles accommodate focal length of eye lens to see nearby objects and far objects?

Answer a:



Answer b: By changing the curvature of lens ciliary muscles accommodate focal length of eye lens to see nearby objects and far objects.

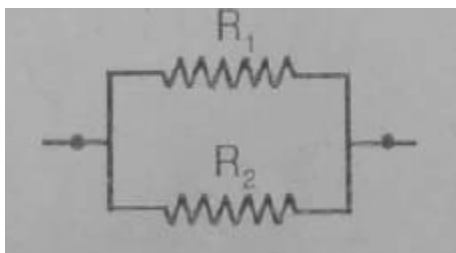
10. (a)



Prove that $R = R_1 + R_2$

Where R is the equivalent resistance of resistors R_1 and R_2 connected in series

(b)



Prove that $1/R = 1/R_1 + 1/R_2$

Where R is the equivalent resistance of resistors R₁ and R₂ connected in parallel.

Answer a: $V_1 = iR_1$

$V_2 = iR_2$

$V_1 + V_2 = V$

$iR_1 + iR_2 = I (R_{eq})$

$R_{eq} = R_1 + R_2$

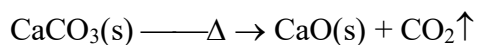
Answer b: $i_1 + i_2$

$V/R_1 + V/R_2 = V/R_{eq}$

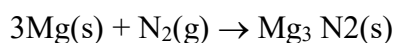
$1/R_{eq} = 1/R_1 + 1/R_2$

11. Write one equation each for decomposition reaction and combination reaction

Answer: One equation for decomposition reaction



One equation for combination reaction



12. Differentiate between washing soda and baking soda.

Answer:

| Washing Soda | Baking Soda |
|---|---|
| It has a pH level of 11 | It has a pH level of 8.1 |
| It derives naturally from plant ashes | It is collected from a natural mineral called nahcolite |
| Its molecular formula is Na_2CO_3 , chemically known as Sodium Carbonate | Its molecular formula is NaHCO_3 , chemically known as Sodium Bicarbonate |
| It is caustic and may scratch surfaces; not safe to eat; should not be applied to the skin. | It is mild and does not damage surfaces; edible and can be used in baking and cooking; can be applied to the skin |

13. Why distilled water does not conduct electricity, whereas rain water does?

Answer: Distilled water does not conduct electricity because it does not contain any dissolved salts. Rain water conducts electricity because it contains dissolved impurities which are capable of conducting electricity.

14. What are alloys? Give two examples of alloys.

Answer: Alloys are metal mixtures with other elements, the precise combination of which is governed by the properties required. In general, alloys are considered metallic in nature, i.e. they have good thermal and electrical conductivity. An alloy is a homogeneous mixture of two or more metals or a metal and a nonmetal. Eg: Brass and Bronze.

15. Give two ways to prevent iron from rusting.

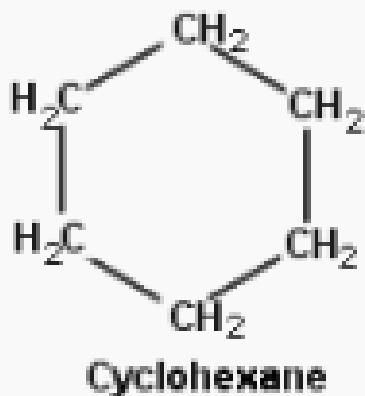
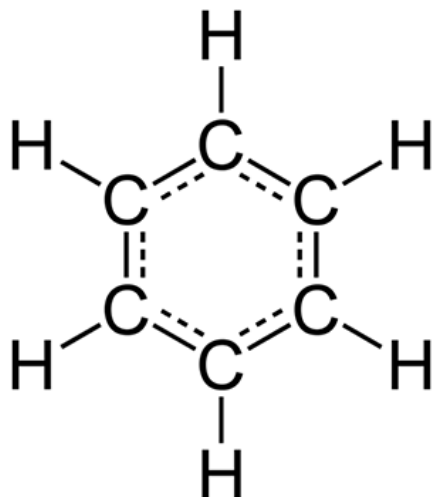
Answer: Two ways to prevent iron from rusting are:

- (i) By painting or greasing
- (ii) By alloying

16. Draw the structure of Benzene and Cyclohexane.

Answer:

STRUCTURE OF BENZENE



17. How the electron configuration of atom is related to its position in the Modern Periodic Table.

Answer: In the Modern Periodic Table the position of an atom is related to the number of electrons in the outermost shell. In a given column or group, all elements have the same number of electrons in their outermost shells.

18. What are the following reaction?

- (i) Addition reactions
- (ii) Substitution reaction
- (iii) Esterification Reaction

Answer i: An addition reaction is a chemical reaction wherein two or more reactants come together to

form a larger single product. But only chemical compounds containing multiple bond character can undergo an addition reaction as a double or triple bond is usually broken to form the required single bonds.



Answer ii: The substitution reaction is defined as a reaction in which the functional group of one chemical compound is substituted by another group or it is a reaction which involves the replacement of one atom or a molecule of a compound with another atom or molecule.



Answer iii: The chemical reaction that takes place during the formation of the ester is called esterification.



19. Write the steps involved in the extraction of metals from their ores.

Answer: The steps involved in the extraction of metal from its ore are as follows:

1. Ores
2. Powdering of ore
3. Concentration of ore
4. Conversion of ore into metal oxide
5. Reduction of metal oxide into metal (Crude metal is obtained)
6. Refining
7. Pure metal

1. Powdering of ores - Ores are broken into small pieces with the help of crushers. These pieces are then reduced to fine powder with the help of a ball mill or a stamp mill.

2. Concentration of ore- The process of removal of unwanted impurities (gangue) from the ore is called ore concentration. It can be done by hydraulic washing, Magnetic separation, Froth floatation leaching.

3. Conversion of ore into metal oxide : It can be done by two process

(i) Calcination (for carbonate ores)

(ii) Roasting (sulphide ores)

4. Reduction of metal oxide into metal: This process depends upon the nature and chemical reactivity of metal.

(i) For low reactive metal : self-reduction process

(ii) For middle reactive metal:

a. Carbon reduction

b. Reduction with CO

c. Reduction with aluminum

(iii) For high reactive metal : Electrolytic reduction

5. Refining of impure metal

- (i) Distillation refining: for refining volatile metals e.g. Zn, Hg
- (ii) Liquation: For refining low m.p. metals e.g. lead, tin
- (iii) Electrolytic refining: For metals like, e.g. Cu, Al etc.

20. Differentiate between autotrophic nutrition and heterotrophic nutrition?

Answer: Autotrophic and heterotrophic nutrition are the two modes of nutrition.

Difference between Autotrophic nutrition and heterotrophic nutrition

| Autotrophic Nutrition | Heterotrophic Nutrition |
|---|---|
| Organisms prepare their own food using simple substances that are available in their surroundings | Organisms obtain their food by digesting organic compounds |
| Phototrophic and Chemotrophic are the two types of autotrophic nutrition | Holozoic, parasitic, symbiotic association, and saprophytic are the four types of heterotrophic nutrition |
| Plants are an example for autotrophic nutrition | Animals and some plants are an example for heterotrophic nutrition |
| Autotrophs are the producers in the food chain | Heterotrophs are the consumers in the food chain |

21. Define hormone. Name any two plant hormones.

Answer: Hormones are chemicals released by the body to control and regulate the activity of certain cells and organs. Special glands known as endocrine glands secrete these hormones.

Two plant hormones are: Auxin and Gibberellins.

22. Give reasons for adopting contraceptive methods.

Answer: Contraceptive methods are mainly adopted because of the following reasons:

- (i) To prevent unwanted pregnancies.
- (ii) To control population rise or birth rate.
- (iii) To prevent the transfer of sexually transmitted diseases.

23. Distinguish between self-pollination and cross-pollination?

Answer:

| Self-Pollination | Cross-Pollination |
|--|---|
| Transfer pollen grains from the anther to the stigma of the same flower. | Transfer pollen grains from the anther to the stigma of the different flower. |
| This process can take place either in the same flower or another flower of the same plant. | This process can take place between two flowers on different plants. |
| It occurs in the flowers which are genetically same. | It occurs between flowers which are genetically different. |
| Occurs only in perfect flowers. | Occurs both in perfect or imperfect flowers. |
| Causes homogenous conditions in progenies. | Causes heterozygous condition in progenies. |
| Self-pollination increases genetic uniformity and decreases genetic variation. | Cross-pollination decreases genetic uniformity and increases genetic variation. |
| Causes inbreeding. | Causes outbreeding. |
| Reduces the gene pool. | Maintains the gene pool. |
| Produces limited amounts of pollen grains. | Produces large amounts of pollen grains. |
| In self-pollination, both the stigma and anther mature at the same time. | In cross-pollination, both the stigma and anther mature at the different time. |
| Transfers few numbers of pollen. | Transfers large numbers of pollen. |
| This process is carried out even when the flowers are closed. | For cross-pollination to happen flower should be open. |
| No need of pollinators to transfer pollen grains. | Require pollinators to transfer pollen grains. |
| Pollen grains are directly transferred onto the stigma of the flower. | Pollen grains are transferred through insects, wind, water, animals, etc. |

24. What do you mean by biological magnification?

Answer: Biomagnification refers to the accumulation of toxic substances in the food chain. The toxic

chemicals that are released into the environment are absorbed by the lower organisms such as plants, earthworms, etc. These chemicals are then transferred to different trophic levels when lower organisms are eaten by other organisms.

The pesticides and chemicals such as DDT, and mercury released into the lakes and rivers are ingested by the aquatic organisms. These get accumulated in their body tissues and are transferred to other organisms that feed on them. Since the pesticides are industrially processed they contain traces of heavy metals such as lead, arsenic, cadmium, etc. These metals have been found in the bodies of animals and humans and are believed to have an adverse effect on them.

25. Give two suggestions to make your school environment friendly.

Answer: Two suggestions to make school environment friendly are:

1. Turn off lights and shut down computers at the end of the day. For environmentally-friendly classrooms, make sure they are well insulated and use sustainable materials.
2. Tell children to bring in old objects and up cycle them into a new creation.

26. How is food transported into plants?

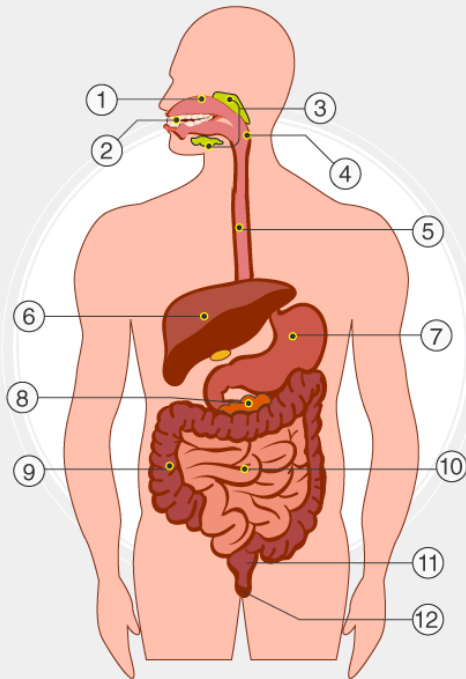
Answer: Transportation is a vital process in all living organism and is involved in the movement of water, minerals and other necessary nutrients to all parts of the plant.

In plants, the synthesized food molecules by the leaves are transported to the different storage organs- roots, stem, fruits with the help of vascular tissue called phloem. The phloems are the complex living tissue present in all vascular plants and are mainly composed of different specialized cells called such as-companion cells, phloem fibres, phloem parenchyma cells and sieve tubes.

27. Draw a well-labelled diagram of human digestive system and describe the digestion of food.

Answer:

HUMAN DIGESTIVE SYSTEM



- | | | | |
|-------------------|--------------------|-------------------|------------|
| 1 Mouth | 2 Teeth | 3 Salivary glands | 4 Pharynx |
| 5 Esophagus | 6 Liver | 7 Stomach | 8 Pancreas |
| 9 Large intestine | 10 Small intestine | 11 Rectum | 12 Anus |

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Digestion Process

The process of digestion begins from the mouth and ends in the small intestine – the large intestines' main function is to absorb the remaining water from the undigested food and enable bacterial fermentation of materials that can no longer be digested.

The alimentary canal or the gastrointestinal tract is a series of hollow organs and tubes that begins from the mouth cavity and continues into the pharynx, through the stomach, small intestines, large intestines, and finally ending at the anus. Food particles get digested gradually as they travel through various compartments of the gastrointestinal tract.

The digestion process takes place in the following steps.

1. Ingestion

The very first step involves mastication (chewing). The salivary glands, along with the tongue helps to moisten and lubricate food, before being pushed down into the food pipe.

2. Mixing and Movement

It involves the process of lubricating and manipulating food and pushing it down the food through the food pipe (using peristalsis), and into the stomach.

3. Secretion

The stomach, small intestine, liver, and pancreas secrete enzymes and acids to aid the process of digestion. It functions by breaking down food particles into simple components and easily absorbable components.

4. Digestion

The process of converting complex food particles into simpler substances in the presence of enzymes and acids secreted by different digestive organs.

5. Absorption

This process begins in the small intestine where most of the nutrients and minerals are absorbed. The excess water in the indigestible matter is absorbed by the large intestines.

6. Excretion

The process of removing indigestible substances and waste by-products from the body through the process of defecation.

28. Describe the structure of Human Brain.

Answer: Human Brain

The human brain controls nearly every aspect of the human body ranging from physiological functions to cognitive abilities. It functions by receiving and sending signals via neurons to different parts of the body. The human brain, just like most other mammals, has the same basic structure, but it is better developed than any other mammalian brain.

Parts of Human Brain

Following are the major parts of the human brain:

Forebrain: It is the anterior part of the brain. The forebrain parts include:

- Cerebrum
- Hypothalamus
- Thalamus

Forebrain Function: Controls the reproductive functions, body temperature, emotions, hunger and sleep.

Fact: The largest among the forebrain parts is the cerebrum. It is also the largest part of all vertebrate brains.

Midbrain: It is a small and central part of the brainstem and consists of:

- Tectum
- Tegmentum

Hindbrain: It is the central region of the brain and is composed of:

Cerebellum

Medulla

Pons

Hindbrain function: The three regions of the hindbrain coordinates all processes necessary for survival. These induce breathing, heartbeat, sleep, wakefulness and motor learning.