

Std.: 9 (English)
Science 2
Chapter: 15
Q.1 Match the pair
2

1	Column A	Column B
i. Growth of pollen tube towards ovule	a. Gravitropic movement	
ii. Growth of root system	b. Chemotropic movement	
	c. Phototropic movement	
	d. Growth-irrelevant movement	

Ans	i. Growth of pollen tube towards ovule	Chemotropic movement
	ii. Growth of root system	Gravitropic movement

2	Column A	Column B
i. Growth of shoot system	a. Gravitropic movement	
ii. Growth towards water	b. Chemotropic movement	
	c. Phototropic movement	
	d. Hydrotropic movement	

Ans	i. Growth of shoot system	Phototropic movement
	ii. Growth towards water	Hydrotropic movement

Q.2 Write Short Notes
10
1 Root pressure

- Ans**
- i. Root cells are in contact with water and minerals in the soil. Water and minerals enter the cells on the root surface due to differences in concentration.
 - ii. As a result, these cells become turgid. These turgid cells exert pressure on the adjacent cells. This is called 'root pressure'.
 - iii. Under the effect of this pressure, water and minerals reach the xylem of the roots and to reduce this difference in concentration they are continuously pushed forward.
 - iv. As a result of this continuous movement, a water column is formed, which is continuously pushed ahead.
 - This pressure is sufficient to lift the water up in shrubs, small plants and small trees.

2 Transpiration

- Ans**
- i. Plants give out water in the form of vapour through the stomata on their leaves.
 - ii. Two cells called guard cells are present around the stomata. These cells control the opening and closing of stomata. Transpiration occurs through these stomata.
 - iii. Water is released into the atmosphere by leaves through the process of evaporation. As a result, water level in the epidermal layer of the leaf decreases.
 - iv. Water is brought up to the leaves through the xylem so as to compensate for the lost water. Transpiration helps in absorption of water and minerals and distribution to all parts of the plant.

3 Nerve cell

- Ans**
- Special types of cells which conduct impulses from one place to another in the body are called neurons.
 - Neurons are the structural and functional units of the nervous system. Nerve cells, the largest cells in the human body, may measure up to a few metres in length.
 - Nerve cells have the ability to generate and conduct electrochemical impulses.
 - The cells that support the nerve cells and help in their functioning are called neuroglia. Nerve cells and neuroglial cells together form the nerves.

4 Reflex action.

- Ans**
- An immediate and involuntary response given to a stimulus from the environment is called a reflex action.
 - Sometimes we react to an incident without any thinking on our part or control over the reaction.
 - This is a response given to a certain stimulus from the surroundings.
 - In such situations, proper control and co-ordination is achieved even without intervention of the brain.

5 Human brain

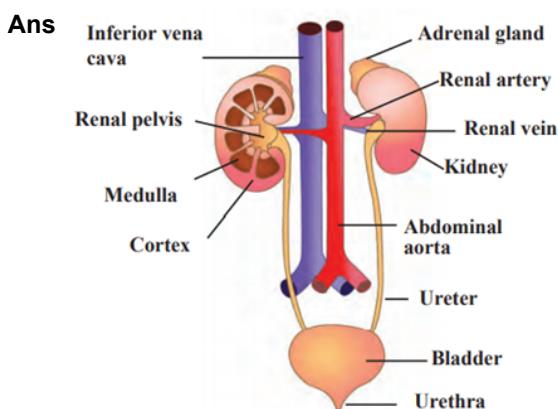
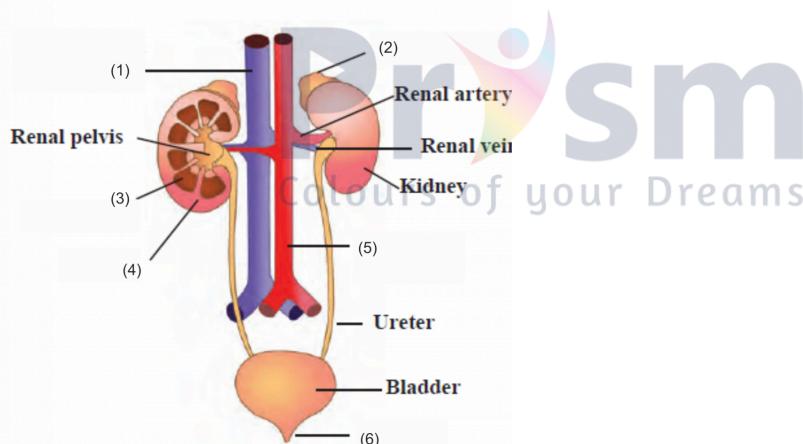
- Ans**
- The brain of an adult human weighs about 1300 – 1400 grams and consists of approximately 100 billion neurons.
 - Cerebrum is largest part of our brain and consists of two cerebral hemispheres. These hemispheres are joined with each other with the help of tough fibres and nerve tracts.
 - Cerebellum is the smaller part of the brain situated below the cerebrum at the back of the cranial cavity.
 - Medulla oblongata is the hind-most part of brain. There are two triangular swollen structures called pyramids on the upper side of medulla oblongata. The medulla oblongata continues downwards as the spinal cord.

Q.3

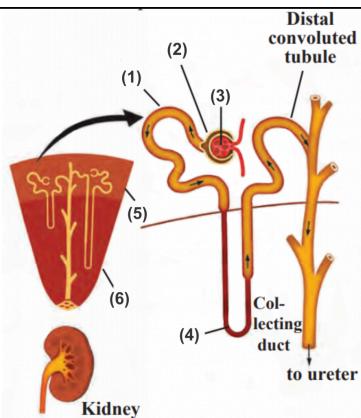
Attempt the following.

1 Label the diagram.

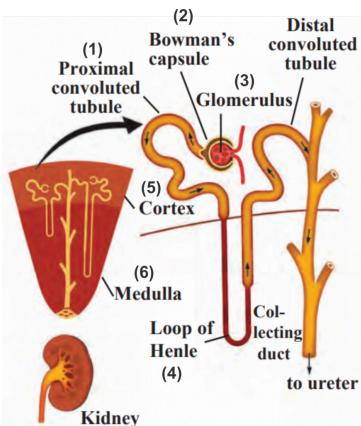
Human excretory system



2 Nephron

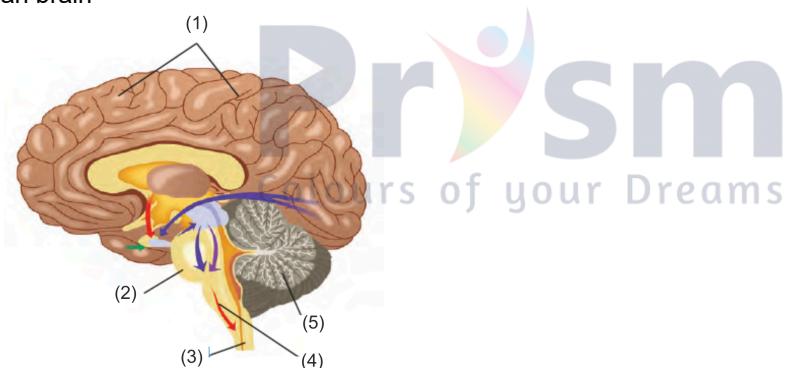


Ans



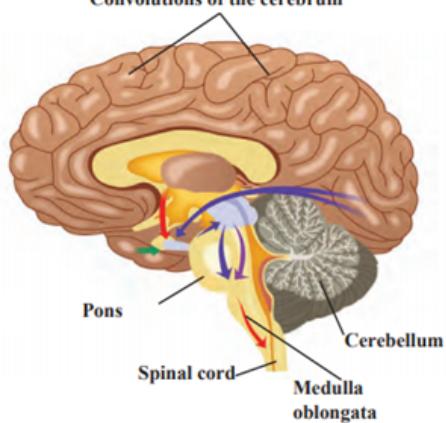
3 Label the diagram.

Human brain



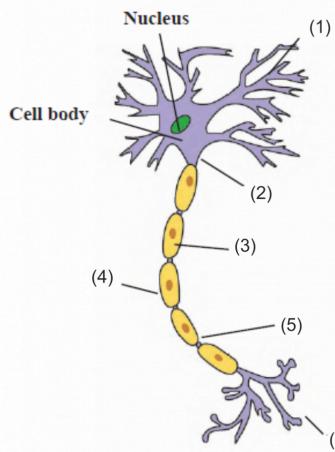
Ans

Convolutions of the cerebrum

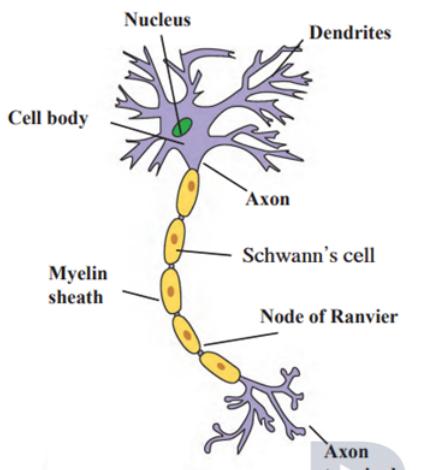


4 Label the diagram.

Nerve cell



Ans



Q.4

Complete the sentences in paragraph

1 Complete the paragraph:

(reflex action, muscle cell, nerve cells, axon, dendrite, synapse)

The milk was on the stove. Rasika was engrossed watching television. She smelled something burning. She ran towards the kitchen. The milk was boiling over. She held the vessel with her bare hands but, screaming, she let it go at once. This activity was controlled by Special ends of in these cells collected the information, from where it was transferred to the cell body and then towards the terminal end of the The chemicals produced at the terminal end passed through the minute space i.e. In this way, impulse is conducted in the body and the process of was completed by conducting the impulses to

Ans The milk was on the stove. Rasika was engrossed watching television. She smelled something burning. She ran towards the kitchen. The milk was boiling over. She held the vessel with her bare hands but, screaming, she let it go at once. This activity was controlled by **nerve cells**. Special ends of **dendrite** in these cells collected the information, from where it was transferred to the cell body and then towards the terminal end of the **axon**. The chemicals produced at the terminal end passed through the minute space i.e. **synapse**. In this way, impulse is conducted in the body and the process of **reflex action** was completed by conducting the impulses to **muscle cell**.

Q.5

Answer the following

1 How is excretion in plants useful to human beings?

Ans i. Human beings make use of waste products produced in plants.
ii. Some excretory products of plants and their uses are as follows:
iii. Latex - It is used for making rubber products.
iv. Resin - It is used for making varnishes, paints and gum.
v. Gum - It is used as an adhesive.

2 Explain chemical co-ordination in humans and give the names and functions of some hormones.

3

21

Ans i. The chemical co-ordination in human body is brought about with the help of certain chemical substances called as hormones.

ii. Hormones are secreted by endocrine glands.

These hormones are directly released into the blood circulation, thus they can reach all parts of the body via blood.

iii. Endocrine glands along with nervous system are responsible for the control and co-ordination in human body.

iv. These two systems help each other in controlling and integrating the various activities of the body.

v. Name and functions of some hormones: (Refer the table 'Endocrine glands: Location and important functions' given in memory map).

3 Name the hormones of the following endocrine glands and their function.

Thyroid, Adrenal.

Ans i. **Thyroid**

- a. **Thyroxine** controls growth of body and metabolic activities.
b. **Calcitonin** controls calcium metabolism and calcium level in blood.

ii. **Adrenal**

- a. **Adrenaline and Nor-adrenaline** controls behaviour during crisis and emotional situations.
b. They also stimulate heart and its conducting tissue and metabolic processes.
c. **Corticosteroid** maintains balance of Na^+ and K^+ and stimulates metabolism.

4 What is meant by co-ordination?

Ans i. Co-ordination is bringing about the different processes of body in the proper sequence.
ii. Proper co-ordination between different systems and organs participating at different steps is necessary for successful completion of a body activity.
iii. Due to lack of co-ordination or confusion at any step, the activity may not get completed.
iv. There needs to be proper co-ordination between the internal activities of the body resulting from various factors like body temperature, water-level, enzyme level, etc. or stimuli arising in the surrounding environment.
v. Co-ordination helps to maintain a state of equilibrium i.e. 'Homeostasis', which is required for optimal efficiency of the body.

5 Name the hormones of the following endocrine glands and their function.

Thymus, Testis, Ovary.

Ans i. **Thymus**

Thymosin controls the cells which give rise to immunity.

ii. **Testis**

Testosterone stimulates growth of secondary sexual characteristics like beard, mustache, hoarse voice, etc. in men

iii. **Ovary**

Oestrogen stimulates growth of endometrium. Also stimulates growth of secondary sexual

- a. characteristics in women.
b. **Progesterone** prepares the endometrium for conception and maintains the pregnancy.

6 Name the hormones of the following endocrine glands and their function.

Pituitary

Ans **Pituitary**

- a. **Growth hormone** stimulates growth of bones.
b. **Adrenocorticotrophic hormone** stimulates adrenal gland.
c. **Thyroid stimulating hormone** stimulates thyroid gland.
d. **Prolactin** stimulates milk producing.
e. **Follicle stimulating hormone** controls growth of gonads.
f. **Luteinizing hormone** controls menstrual cycle and ovulation.
g. **Oxytocin** contracts uterus during parturition.
h. **Antidiuretic hormone** regulates water level in the body.

7 Describe the transportation system in plants.

Ans i. Plants have two types of conducting tissues i.e. xylem (conducts water) and phloem (Atmosphere food).

- ii. During the process of transpiration, water from leaves gets released into the
- iii. As a result, water level in the epidermal layer of the leaf decreases.
- iv. Water absorbed by roots is transported up to the leaves through the xylem so as to compensate for the water loss due to transpiration.
- v. The food produced by leaves is transported to each cell of the plant body through phloem.
- vi. When the food material like sucrose, is transported towards a part of a plant through phloem, with the help of ATP, the water concentration decreases in that part.
- vii. Due to this, water enters the cell by diffusion process. Increase in cellular content results in increase in pressure on the cell wall.
- viii. Due to this increased pressure, food is pushed into the neighbouring cells where the pressure is low.
- ix. This process helps the phloem to transport food material from leaves to growing tissues.

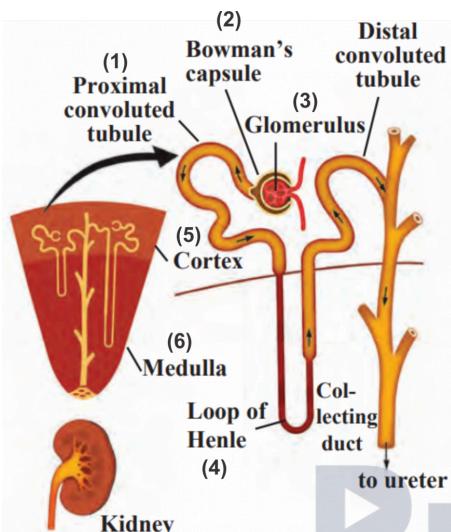
Q.6

Extra data

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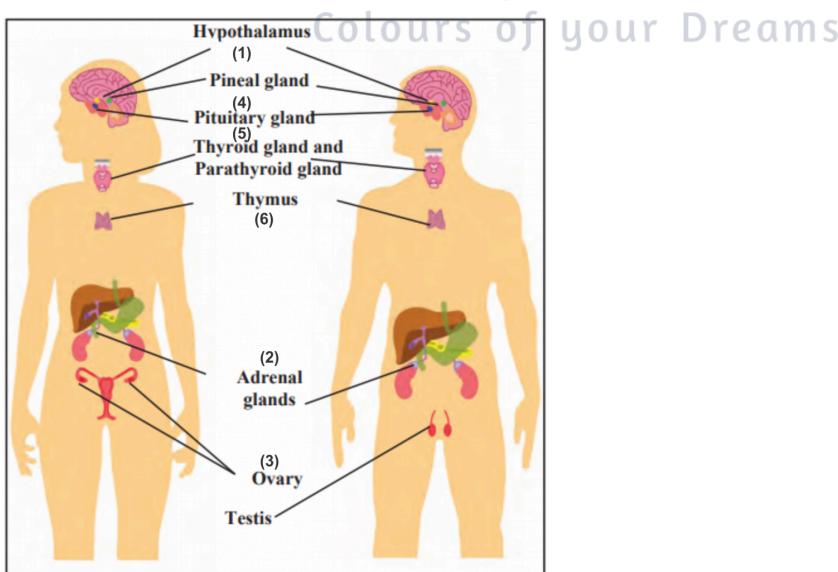
1 Nephron

Ans



2 Human endocrine glands

Ans



3 Name the hormones of the following endocrine glands and their function.

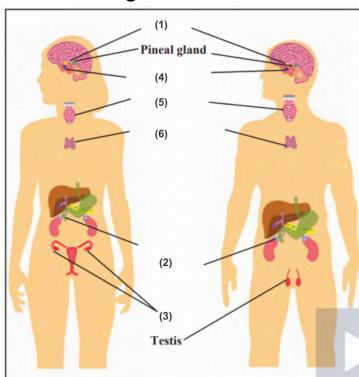
Pituitary, Thyroid, Adrenal, Thymus, Testis, Ovary.

Ans i. Pituitary

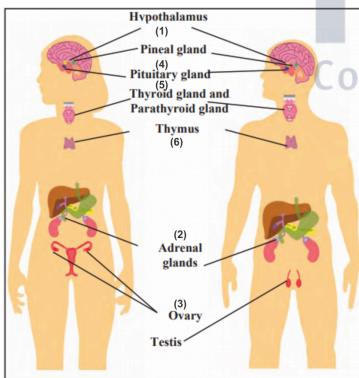
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- iv. **Thymus**
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 - Testosterone** stimulates growth of secondary sexual characteristics like beard, mustache, hoarse voice, etc in men
- vi. **Ovary**
 - Oestrogen** stimulates growth of endometrium. Also stimulates growth of secondary sexual characteristics in women.
 - b. **Progesterone** prepares the endometrium for conception and maintains the pregnancy.

4 Endocrine glands



Ans



Q.7

Answer the following in detail

10

1 Explain co-ordination in plants with the help of suitable examples.

- Ans i. Co-ordination is bringing about the different processes of body in the proper sequence.
- ii. Unlike animals, plants do not have a nervous system or muscular system to bring about co-ordination.
- iii. Co-ordination in plants is exhibited during various kinds of movements that are mainly in the form of responses given to the stimuli.
- iv. The various types of growth relevant movements are as follows:
- Tropic Movement:** Movement or growth of any part of the plant in response to an external stimulus is called tropic movement.
 - Phototropic Movement:** The shoot system of any plant responds to the stimulus of light i.e. it grows towards the source of light. This type of movement is called phototropic movement.
 - Gravitropic Movement:** The root system of plants respond to stimuli like gravitation. This response is called gravitropic movement.
 - Hydrotropic Movement:** When the root system of plants respond to stimuli like water and grow towards source of water, this type of movement is called hydrotropic movement.
 - Chemotropic Movement:** The movement shown by plants in response to specific chemicals is called chemotropic movement.

- chemotropic movement. For example, the growth of the pollen tube towards the ovule.
- v. Many plant hormones are also responsible for various kinds of movement in plants as a response to change in surrounding. For example:
 - a. Auxins produced in the apical part of the shoot helps in enlargement of cells.
 - b. Gibberellins help in stem elongation.
 - c. Cytokinins help in cell division.
 - d. Abscisic acid is effective in prevention and retardation of growth, leaf wilting, etc.
 - vi. Certain movements do not lead to the plant's growth and are called as growth irrelevant movements.
 - vii. In plants like touch-me-not (Mimosa), movements occur by changing the water content of the cells. These plants use electro-chemical impulses for transfer of information from one place to another.
 - viii. Plant cells change their shape by increasing or decreasing their water content and thus show movements.

2 How does excretion occur in human beings?

- Ans**
- i. The process of elimination of toxic and nitrogenous waste products from the body is called excretion.
 - ii. In human beings, excretory system carries out the function of excretion.
 - iii. The human excretory system consists of a pair of kidneys, a pair of ureters, the urinary bladder and the urethra.
 - iv. Kidneys separate the waste and unwanted excess substances from the blood and form urine.
 - v. Nephron, the functional unit of kidneys perform the basic function of filtration.
 - vi. Urea containing blood, enters the glomerulus where it is filtered through capillaries. Thus, urea and other substances get separated from the blood.
 - vii. Water and some other small molecules have the ability to cross semipermeable membrane of Bowman's capsule.
 - viii. The solution accumulated in the cavity of Bowman's capsule passes into the tubular part of the nephron where water and some other useful substances are reabsorbed into the blood.
 - ix. Urine formed from remaining solution of waste materials is carried by ureters and stored in the urinary bladder.
 - x. This urine is then given out through urethra.
 - xi. Human beings are able to keep a control on urination as the urinary bladder is under the control of nerves.
 - xii. Though kidneys are the main organs of excretion but skin and lungs also help in excretion in humans.