Life Processes in Living Organisms

Exercises

Q. 1. Match the pairs and explain.

'A'	'B'
1. Growth of pollen tube towards ovule	a. Gravitropic movement
2. Growth of shoot system	b. Chemotropic movement
3. Growth of root system	c. Phototropic movement
4. Growth towards water	d. Growth-irrelevant movement
	e. Hydrotropic movement

Answer :

'A'	'B'	Explanation
Growth of pollen tube towards ovule	Chemotropic movement	Pollen tube grows towards ovule due to presence of sugar (chemical) in style.
Growth of shoot system	Phototropic movement	Shoot (stem and leaves) grows towards the light (photo).
Growth of root system	Gravitropic movement	Root grows towards the gravity or opposite to light.
Growth towards water	Hydrotropic movement	Movement root towards water (hydro).

Q. 2. Complete the paragraph.

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 ..... cells. Special ends of ..... in these cells collected the information, from where it was transferred to the ..... 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, ……. were conducted in the body and the process of ..... was completed by conducting the impulses from.... ..... to .....

(Nerve, muscle cell, impulse, dendrite, synapse, axon, reflex action, cell body)

Answer :

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..... were conducted in the body and the process of .....reflex action.... was completed by conducting the impulses from....nerve cells ..... to ....muscle cells....

Q. 3. Write notes on-

Root pressure, Transpiration, Nerve cell, Human brain, Reflex action

Answer : Root pressure: After absorbing water from the soil root cell swells (turgid). The turgid root cell put pressure on the adjacent root cell. This pressure is called root pressure. Water and minerals reach to the water conducting (xylem) of the root due to this pressure.

Transpiration: Removal of water in the form of vapours through pores (stomata) present in the leaves is called transpiration. It occurs during day. Transpiration promotes absorption and distribution of water and minerals. It gives cooling effect to the plants.

Nerve cell: Nerve cell or neuron is the largest cell of the human body. It consist of a cell body, dendrites and axon. Neurons are the structural and functional units of the nervous system. They conduct impulses from one place to another in the body.

Human brain: Human brain is very delicate organ. An adult human brain weighs about 1.3 kg to 1.4 kg and has 100 billion of nerve cells. It is the main controlling part of the nervous system and it is safely located in the cranial cavity. It is protected by three layers called meninges. In the brain there are various cavities called ventricles. In the ventricles the long tubular cavity of the spinal cord is called the ‘central canal’. The ventricles, central canal and in the layers of meninges are filled with cerebro-spinal fluid. This fluid supplies nutrients to the central nervous system and protects it from shock.

The human brain has the following parts:

i. Cerebrum: The largest part of the brain, occupies two-thirds of brain and consists of two cerebral hemispheres. They are joined by nerve tracts. It control of voluntary movements such as decision-making, memory, intelligence.

ii. Cerebellum: this part is smaller than the cerebrum, situated below the cerebrum at the back of the cranial cavity. It maintains the body's balance and co-ordinates of voluntary movements.

iii. Medulla oblongata: The hind-most part of brain. The medulla oblongata continues downwards as the spinal cord. It controls involuntary activities (activities which are not our control) such as of the heart, blood circulation, breathing, sneezing, coughing, etc.

Reflex action: Reflex actions are sudden, automatic reactions of the body in response to stimuli (The change which promotes a reaction in an organ or tissue in response to that change). Reflex actions occur without the involvement of the brain, these actions involved spinal cord.

For examples, contraction of the pupils of the eye when exposed to light, Withdrawal of the hands when one touches a burning candle.

Q. 4. Name the hormones of the following endocrine glands and the function of each.

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

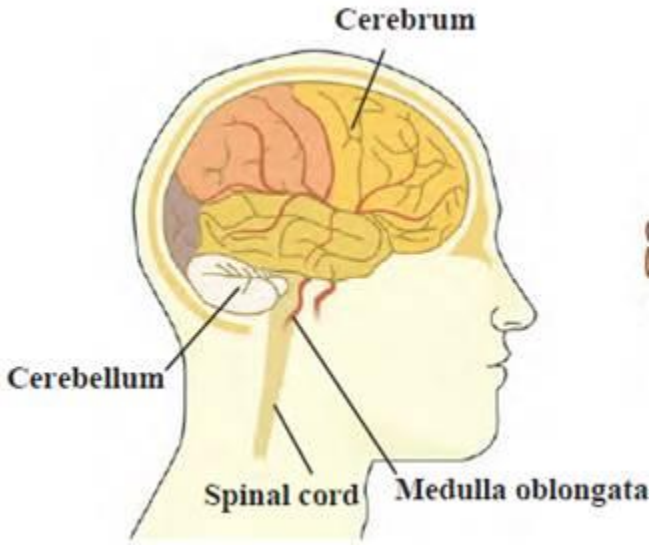
Answer :

Glands	Hormones	Functions
Pituitary	Growth Hormone Adrenocorticotropic hormone Thyroid stimulating hormone Prolactin Follicle stimulating hormone Luteinizing hormone Oxytocin Antidiuretic hormone	It regulate height and growth Controls the adrenal gland Controls the thyroid gland Regulates milk production Stimulates ovary to produce estrogen and release of egg Stimulates ovaries to produce the corpus luteum (for ovulation) from ruptured follicle. Contracts uterus during child birth. Regulates water-level in the body
Thyroid	Thyroxine Calcitonin	Controls body growth and metabolism Maintains calcium and phosphorus balance in the body.
Adrenal	Adrenaline Nor-adrenaline	It is stress hormone, it controls behavior during emergency and emotional situations. It maintains balance of Na^+ and K^+ and stimulates metabolism
Thymus	Thymoson	It is part of body defense which gives immunity.
Testis	Testosterone	Stimulates growth of secondary sexual characters such as beard, moustache, pubic hair, etc. in men
Ovary	Oestrogen Progesterone	Responsible for female sexual characteristics breast growth, growth of pubic and underarm hair. Prepares the uterus for pregnancy.

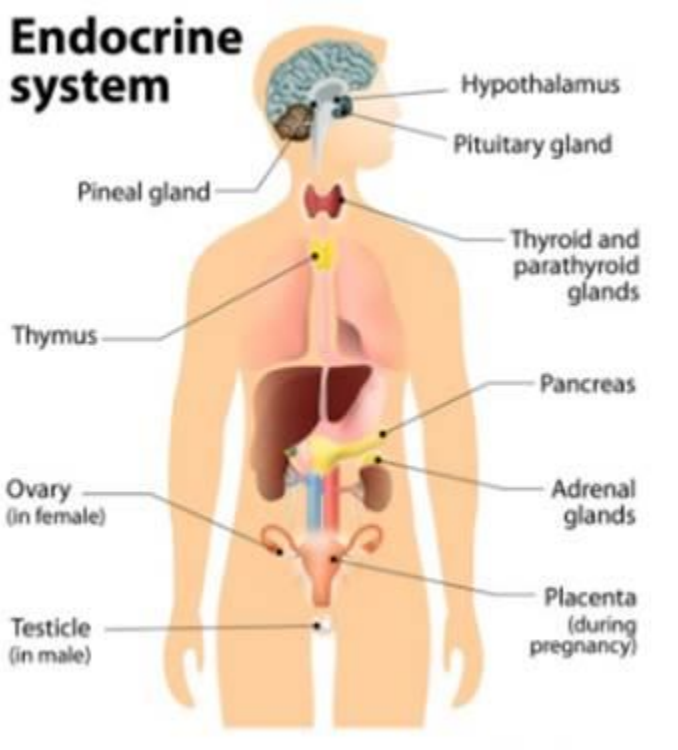
Q. 5. Draw and label the diagrams.

Human endocrine glands, Human brain, Nephron, Nerve cell, Human excretory system.

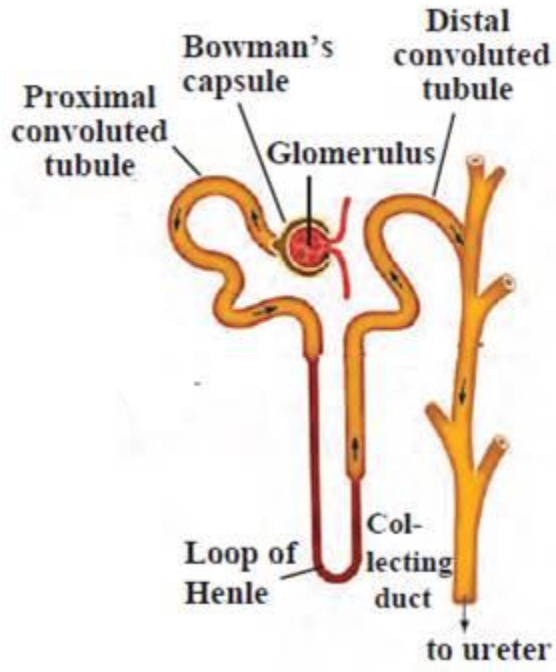
Answer : Human brain:



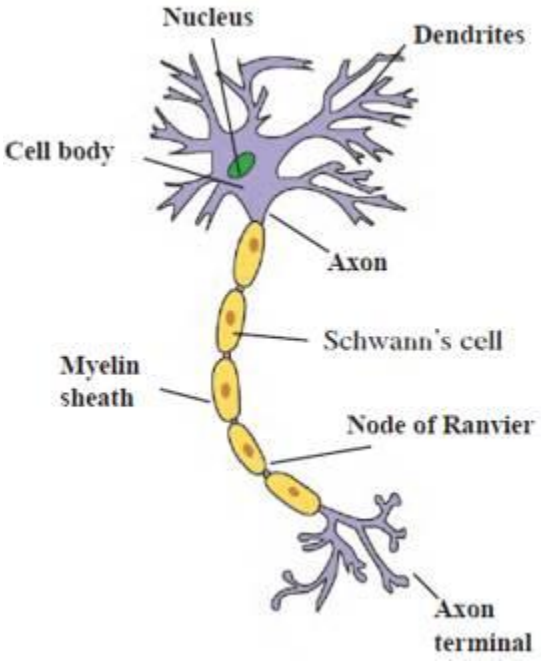
Human endocrine glands:



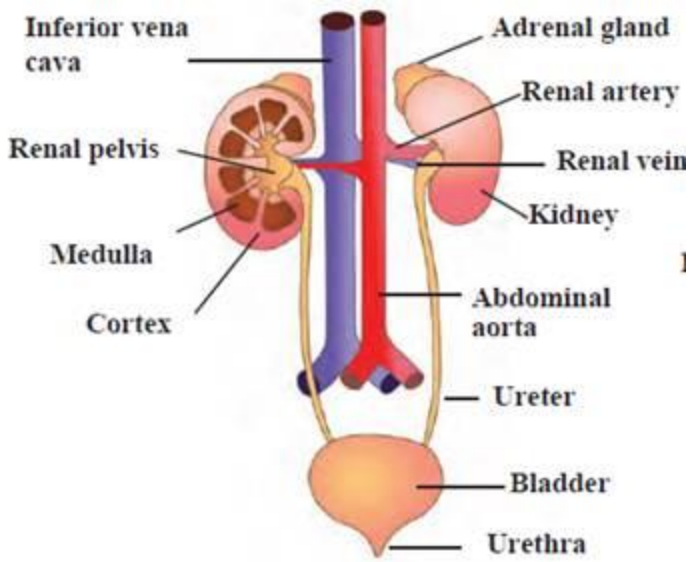
Nephron:



Nerve cell:



Human excretory system:



Q. 6. Answer the following.

A. Explain chemical co-ordination in humans and give the names and functions of some hormones.
B. Explain the difference between the excretory system of humans and plants.
C. Explain co-ordination in plants with the help of suitable examples.

Answer : A. Human body is chemically coordinated by the complex chemical compounds called **hormones**. They are secreted by endocrine glands, examples thyroid, pituitary, adrenal glands. Hormones are released directly into blood circulation and transport to the target organ for chemical co-ordination.

Some of the hormones are:

i. Growth hormone: It regulate height and growth of human body.

ii. Thyroxine: Stimulate tissue metabolism and maintains basic metabolic rate.

iii. Adrenaline: It is stress hormone, it controls behaviour during emergency and emotional situations.

B.

•Removal of waste products from the body is called excretion. Excretion is carrued out by the excretory system.

•The primary components of the excretory system are the kidneys, the ureter, the urinary bladder, and the urethra.

•When blood reaches the kidneys, useful substances are absorbed back into blood, while the waste materials are dissolved in water and removed from the body in the form of urine.

•Plants remove waste materials by various processes as they do not have any excretory system.

•Oxygen, a by-product of photosynthesis is removed through stomata.

•Most of the waste substances of plants are stored in vacuoles of leaf-cells and in flowers, fruits and the bark of the stem.

•Some waste materials are stored in xylem the form of resin and gum. Some waste materials excreted through roots into the surrounding soil.

C.

Nervous system and muscular system bring movement in animals. These systems are absent in plants. It doesn't mean that plant do not show movement. Plants also show movements, called growth movements. The plant hormones or growth regulators bring about coordination in plants.

Examples:

•**Auxin:** it promotes growth in the stem and root.

•**Gibberelin:** it promotes seed germination.

•**Cytokinin:** it promotes cell division.

•**Abscisic acid:** it prevents seed germination.

Q. 7. Explain in your own words with suitable examples.

A. What is meant by co-ordination?
B. How does excretion occur in human beings?
C. How is excretion in plants useful to human beings?
D. Describe the transportation system in plants.

Answer : A.

The working together of various organs of the body of an organism in a proper manner to produce an appropriate reaction to the changes in the environment is called coordination. In humans, coordination is done by the nervous system and the endocrine system. Neurons and hormones together bring growth and movements in humans.

In plants, plant hormones such as auxin, cytokinin bring coordination.

B.

The primary components of the excretory system are the kidneys. The kidney is made of its units called nephron. When blood reaches the kidneys, nephrons filter blood. The useful substances are absorbed back into the blood, while the waste materials are dissolved in water and removed from the body in the form of urine. With the help of ureter, urinary bladder, and urethra, the urine is discharged.

C.

The excretory products of plants such as Rubber, wax, gums, resins. All these products are used by humans in their daily activities.

D.

The transport system in plants consists of xylem and phloem. Xylem transports water and minerals from the soil to the roots and from roots to every part of the plant. Phloem transports food from leaves to other parts of the plant.

Q. 8. Collect information about the evolution of the brain of vertebrates and present it in the classroom.

Answer : The brain structure in all vertebrate (animals with backbone) is basically the same. In the course of evolution, the vertebrate brain has undergone changes, and become more effective. In lower animals frogs and lizards most of the brain structure is transfer from one generation to other. Therefore, their behaviour is mostly without any teaching. In mammals, and especially in humans, the brain is developed further during life by learning. This has the benefit of helping them fit better into their environment.

Q. 9. Explain the functions of various endocrine glands by presenting an act like 'Why I Am Important?'

Answer : Hello!! I am pituitary gland, I secrete many hormones, I am important because I regulates growth and stimulate other glands to secrete their hormones.

Hello!! I am thyroid gland, I secrete thyroxine, I am important because I control growth and metabolic activities.

Hello!! I am adrenal gland, I secrete adrenaline, I am important because I help in bearing stress during emergency.

Hello!! I am thymus gland, I secrete thymosin, I am important because I protect your body from diseases.

Q. 10. Collect the information to justify the statement 'Human beings are intelligent and different from other animals' and present it in the classroom.

Answer : Human beings are intelligent and different from other animals due to the following reasons:

I. Size of the brain: in enlarged brain in neuron connections more which increases IQ. Whereas, the number of brain cells actually remains constant in other animals.

II. Development of large number of folds: a greater number of folds in the cerebral cortex is a significant step in human brain evolution, it increases intelligence.

III. Division of cerebrum: Another unique feature of the human brain division of the cerebrum into 2 halves. The left side of our brain controls the right side of our body and right side of our brain controls left side of the body.