

SCIENCE

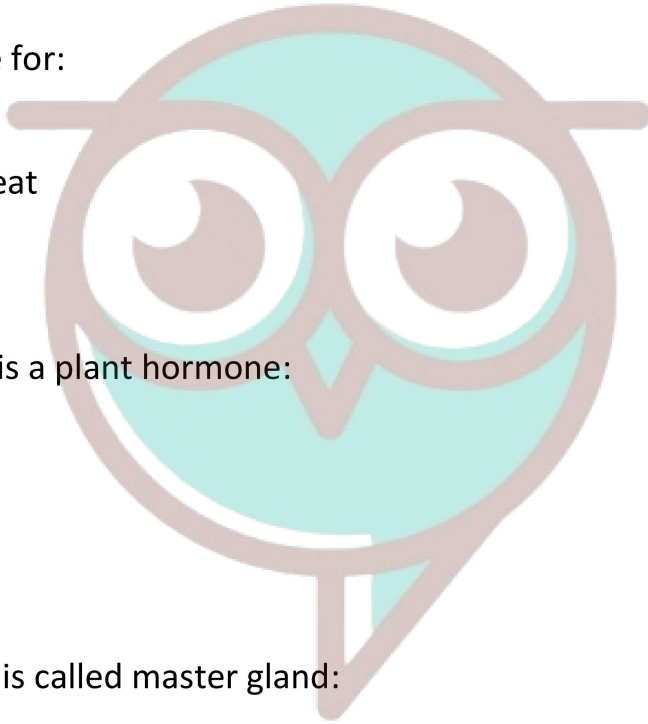
(Biology)



Important Questions

➤ Multiple Choice Questions:

1. The gap between two neurons is called a:
 - (a) dendrite
 - (b) synapse
 - (c) axon
 - (d) impulse
2. The brain is responsible for:
 - (a) thinking
 - (b) regulating the heart beat
 - (c) balancing the body
 - (d) all of the above
3. Which of the following is a plant hormone:
 - (a) insulin
 - (b) thyroxin
 - (c) oestrogen
 - (d) cytokinin
4. Which endocrine gland is called master gland:
 - (a) pituitary
 - (b) adrenal
 - (c) thyroid
 - (d) pancreas
5. Cartisons are secreted by:
 - (a) pancreatic gland
 - (b) adrenal gland
 - (c) thyroid gland
 - (d) pituitary gland
6. Female sex hormone is:
 - (a) estrogen
 - (b) androgen



Swotters

(c) insulin

(d) adrenalin

7. Insulin is secreted by:

(a) stomach

(b) liver

(c) pancreas

(d) kidney

8. In case of emergency which structure becomes very active:

(a) adrenal medulla

(b) adrenal cortex

(c) thyroid gland

(d) pancreas

9. Growth, mental development and tissue differentiation is controlled by:

(a) glucagon

(b) parathormone

(c) thyroxine

(d) cortisol

10. Heartbeat is increased by:

(a) thyroxine

(b) adrenalin

(c) gastrin

(d) glucagon

➤ **Very Short Question:**

1. Write the function of hormone thyroxine in our bodies.
2. Name the part of hind brain which takes part in regulation of respiration.
3. Which hormones helps in lowering the level of blood glucose in human beings?
4. We suddenly withdraw our hand when a pin pricks. Name the type of response involved in this action.
5. Which hormone is responsible for the development of moustache and beard in man?
6. Which type of glands in human body secrete hormones? State any one location for them.
7. Name the structural and functional units of human nervous system.

8. What is neuron?
9. What are phytohormones?
10. Name the largest cell present in human body.

➤ Short Questions:

1. Name two hormones secreted by pancreas. Write one function of each hormone named.
2. Name the hormone responsible for regulation of
 - Metabolism of carbohydrates, fats and proteins
 - Balance of calcium and phosphate
 - Blood pressure
 - Water and electrolyte balance.
3. What is reflex action? Explain the mechanism of reflex action with a suitable example.
4. Name the three major regions of human brain. Which part of brain maintains posture and equilibrium of the body?
5. Maintenance of Posture and Equilibrium. Cerebellum.
 - (a) Distinguish between voluntary and involuntary actions of our body.
 - (b) Choose involuntary actions, amongst the following:
Reading, Beating of heart, Salivation in the mouth on viewing tasty food, Talking.
6. Explain the cause of shoots of the plant bending towards light?
7. What are nastic and curvature movements? Give one example of each.
8. Draw a diagram of a nerve cell and label on it following:
 - (a) Nucleus
 - (b) Dendrites

➤ Long Questions:

1. (a) What is reflex action? Give its two examples. Illustrate the pathway followed by a message from the receptor in a reflex arc.
 - (b) Name the actions of sympathetic and parasympathetic systems on eye.
2. (a) What are "hormones"?
- (b) List four characteristics of hormones
- (c) Name the hormone required for the following:
Functioning of mammary glands

Regulation of calcium and phosphate

Lowering of blood glucose

Development of moustache and beard in human male.

3. (a) What is

- Phototropism and
- Geotropism?

With labelled diagrams describe an activity to show that light and gravity change the direction that plant parts grow in.

(b) Mention the role of each of the following plant hormones:

- Auxin
- Abscisic acid.

➤ Assertion Reason Questions:

1. Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true, and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Assertion(A): Insulin regulates blood sugar level.

Reason (R): Insufficient secretion of insulin will cause diabetes.

2. Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true, and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

Assertion(A): Animals can react to stimuli in different ways.

Reason (R): All animals have a nervous system and an endocrine system involving hormones.

✓ Answer Key-

➤ Multiple Choice Answers:

1. (b) synapse
2. (d) all of the above
3. (d) cytokinin

4. (a) pituitary
5. (b) adrenal gland
6. (a) estrogen
7. (c) pancreas
8. (a) adrenal medulla
9. (c) thyroxine
10. (b) adrenalin

➤ Very Short Answers:

1. Answer: It controls basal metabolic rate and regulates metabolism of carbohydrates, fats and proteins.
2. Answer: Medulla oblongata.
3. Answer: Insulin.
4. Answer: Reflex action.
5. Answer: Testosterone.
6. Answer: Endocrine or ductless glands, e.g., thyroid in neck region around trachea.
7. Answer: Neuron.
8. Answer: Neuron or nerve cell is a structural and functional unit of nervous system that is specialized to receive, conduct and transmit impulses.
9. Answer: Phytohormones are chemical substances other than nutrients produced naturally in plants which regulate growth, development, differentiation and a number of physiological processes, e.g., auxin, gibberellins, abscisic acid, cytokinin's.
10. Answer: Neuron (length 90-100 cm).

➤ Short Answer:

1. Answer:

Insulin (secreted by β -cells of islet of Langerhans)

Recognition of glucose by cells for absorption and conversion of glucose into glycogen in liver and muscles.

Glucagon (secreted by α -cells of islet of Langerhans)

Formation of glucose from glycogen and other sources and its release into blood.

2. Answer:

- Thyroxine
- Parathormone (also calcitonin)

- Adrenaline
- ADH or vasopressin and aldosterone (a mineralocorticoid).

3. Answer:

Reflex Action: It is an automatic nerve mediated response to a stimulus without consulting the will of the individual, e.g., withdrawal of hand on being pricked or coming in contact with hot surface.

Mechanism: The stimulus for reflex action is picked up by a receptor located in the organ on which stimulus is acting. One or more sensory neurons carry the impulse from receptor to the central nervous system (e.g., spinal cord). CNS functions as modulator. It transfers the sensory nerve impulse to one or more motor neurons. The motor neurons carry the impulse to effectors which provide a proper response to the stimulus.

Stimulus → Receptor → Sensory neurons → CNS → Motor neurons → Effectors → Response.

4. Answer: Major Regions of Brain

Fore Brain: Olfactory lobes (2), Cerebrum (2 cerebral hemispheres) and diencephalon.

Mid Brain: Cerebral peduncles (crura cerebri) and four quadrigemina.

Hind Brain: Cerebellum, pons and medulla oblongata.

5. Answer:

(a) Differences between Voluntary and Involuntary Actions

Voluntary Actions	Involuntary Actions
1. Will. They are under control of the will.	They are performed without consulting the will.
2. Muscles. The actions are performed with the help of striated muscles.	The actions are performed with the help of smooth muscles.
3. Activities. They are connected with the functioning of external organs.	They are connected with the functioning of internal organs.

(b) Beating of heart, salivation in the mouth on viewing of tasty food.

6. Answer: Stems are positively phototropic and bend towards the direction of light. The movement is due to occurrence of more auxin on the darker side and lesser auxin on the illuminated side. As a result, there is more growth on the darker side which causes the stem to bend towards light.

7. Answer:

(a) Nastic Movements: They are non-directional curvatures movements of turgor or growth where the movements are determined by the structure of the responding organ irrespective of the direction of stimulus which is generally diffuse. Ex. Drooping and folding of leaves in Sensitive Plant in response to shock (seismonasty).

(b) Curvature Movements: They are changes in orientation of some plant parts in relation to others caused by intrinsic or external stimuli. Ex. Sleep movement or nyctinasty of legume leaves, bending of stems towards light (or positive phototropism of stems).

8. Answer:

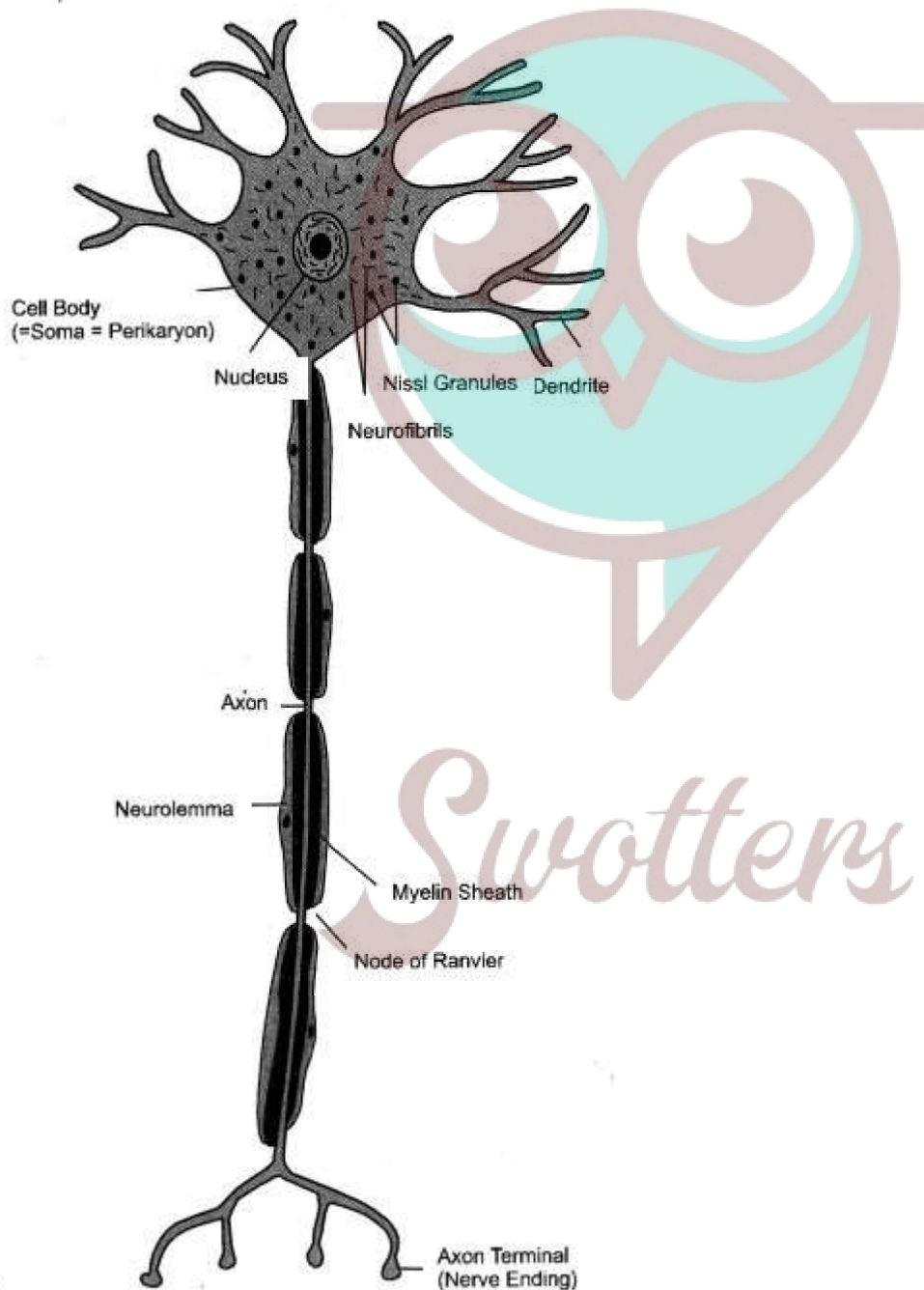


Fig. 2.1. Structure of a neuron.

➤ Long Answer:

1. Answer:

(a) Reflex Action: It is an automatic, spontaneous nerve mediated response to a stimulus without consulting the will of the individual.

e.g., withdrawal of hand on being pricked or coming in contact with hot surface.

(b) Effect on Pupil,

- Sympathetic - dilation
- Parasympathetic - constriction.

2. Answer:

(a) Definition: Hormones (Gk. hormein— to excite) are chemical messengers or informational molecules produced by ductless glands which are translocated by circulatory system to other body parts for inducing and coordinating their activities including growth. First hormone, secretin, was discovered by Bayliss and Starling (1902). The term hormone was coined by Starling (1905)

(b) Characteristics:

- Hormones are produced by endocrine or ductless glands.
- They are poured into circulatory system for passage to different body parts.
- Target Sites. Hormones act on specific cells, tissues and organs called target sites, generally away from the place of their synthesis.
- They function as chemical messengers or informational molecules that trigger specific chemical and physiological processes of target cells.
- Slow Action. Since hormones reach the target sites through blood, their effect appears after a lag period. They are slow acting with the exception of adrenaline.
- Chemical Nature. Hormones are small sized organic molecules which are of diverse origin— proteins, peptides, amino acids, amines and steroids.
- Non-nutrient Nature. Hormones are nonnutrient in nature. They have no role in providing energy or body building materials. Hormones take part in stimulation or inhibition of physiological processes.
- The hormones are effective in very low concentration, e.g., adrenaline one in 300 million parts.
- It is very specific. TSH acts only on thyroid while thyroxine affects all body parts.
- Hormones are generally produced in response to specific stimuli.

- Hormones are ultimately broken down or consumed during their activity in target cells.
- Deficiency or Excess. Both deficiency and excess of hormone are harmful, often leading to serious disorders.

(c) The Hormone are Required:

- Functioning of Mammary Glands. Prolactin.
- Regulation of Calcium and Phosphate in Blood. Parathormone.
- Lowering of Blood Glucose. Insulin.
- Development of Moustache and Beard in Human Male. Testosterone.

3. Answer:

(a) Definition of Phototropism: It is directional growth movement of curvature which occurs in plants in response to stimulus of unilateral light.

Definition of Geotropism: It is directional growth movement of curvature which occurs in response to force of gravity. Main root shows positive geotropism while main stem shows negative geotropism.

Activity: Phototropism and Geotropism- Take two potted plants. Place one plant near a window. Keep the other pot tilted horizontally in the open. Water the plants on alternate days. Observe after a week. Potted plant kept near the window shows bending of young stems towards the window. They are positively phototropic. In the horizontal pot, the stem bends upward as it is negatively geotropic. Its root if taken out, shows downward bending indicating its positive geotropic nature.

(b)

- Role of Auxin. It promotes cell enlargement, fruit growth, apical dominance, rooting of cuttings, prevention of abscission and differential growth during tropic movements.
- Role of Abscisic Acid. It checks excessive activity of auxin and gibberellins, closes stomata in water deficiency, induces dormancy of buds and seeds.

➤ Assertion Reason Answer:

1. (a) Both A and R are true, and R is the correct explanation of A.
2. (a) Both A and R are true, and R is the correct explanation of A.