

UPDAAN



2025

Control and Coordination

Biology

Lecture – 07

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Topics

to be covered

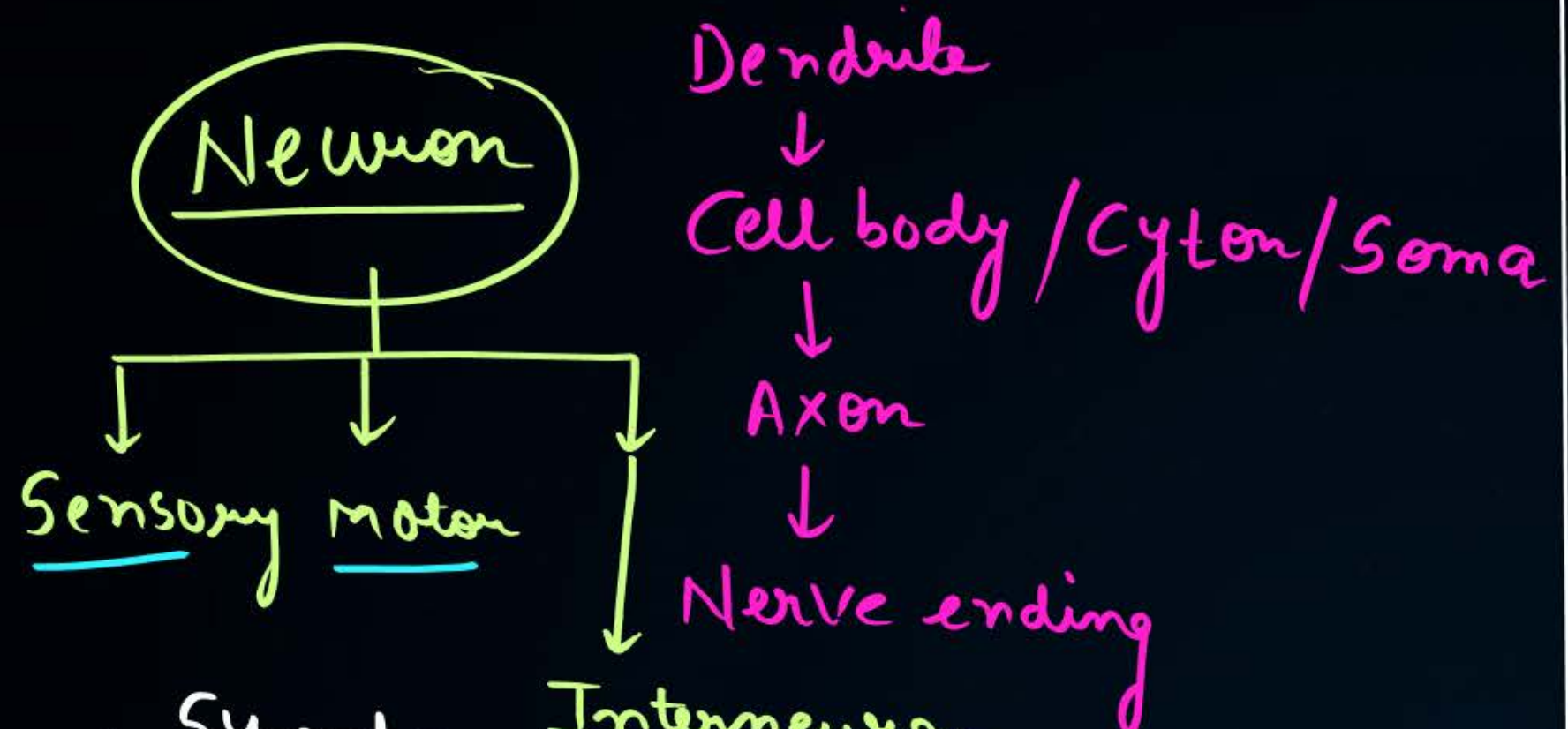
1 Question Practice ✓

→ MCQ

→ Subjective Q's

2 Doubt Discussion





- Synapse Interneuron (Relay)
- Neuro-Muscular junction [NMJ]

ABA

DAP

CSF

- Nastic Movements [No growth]
- Tropic Movement [Growth]

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Syllabus and weightage

Analysis

Control & Coordination \Rightarrow [4-6 marks]



Lists of Concept Names	Years				
	2020	2021	2022	2023	2024
Nervous System (Nervous system; Voluntary, involuntary and ✓ reflex action)	—	Exam not conducted	—	—	—
Plant Movement (Tropic movements in plants; Introduction of plant hormones)	—		—	1 Q (1 M)	1 Q (1 M) 1 Q [2 m]
Human Endocrine System ✖✖ (Control and co-ordination in animals: chemical co-ordination: animal hormones)	1 Q (4 M)		—	—	1 Q (1 M) 1 Q (5 M)

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PYQ's and Important

**Multiple choice ✓
questions**

QUESTION

Reflex action → (S.C) → Brain



If a person's spinal cord is injured at the lower back, what immediate effect would this injury have on the body's ability to perform reflex actions below the point of injury?

- A** Reflex actions in the upper body will be significantly enhanced. ✗
- B** Reflex actions in both the upper and lower body will remain unaffected. ✗
- C** Reflex actions in the lower body, below the point of injury will probably be impaired or paralyzed. ✓ ✓ ✓
- D** Only the involuntary actions in the lower body will be impaired or paralyzed. ✓ ✓

Q-1 (un)

QUESTION

at synapse electrical signal is converted into chemical signal

In a synapse chemical signal is transmitted from _____. (Re)

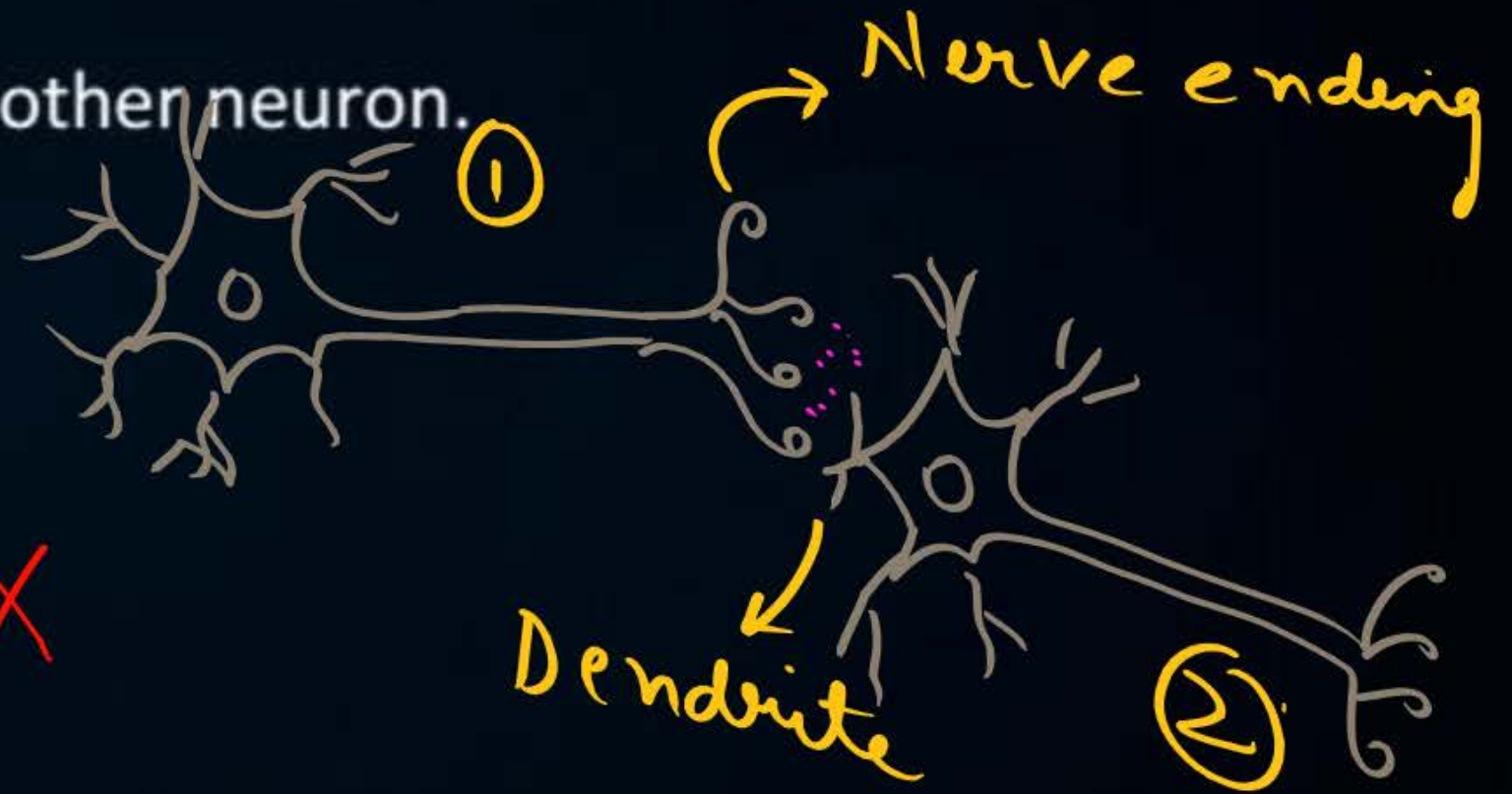
Q-2

A dendrite of one neuron to axonal end of other neuron.

B axon to cell body of same neuron. X

C cell body to axonal end of same neuron. X

☒ **D** axonal end of one neuron to dendrite of another neuron.



1. ✓ ✓ ✗
2. ✓ ✓
3. ✓
4. ✓
5. ✓
6. ✓
7. ✓
8. ✓
- 9.
- 10.



QUESTION

✓ Q-3



A student can still play a piano piece flawlessly even after not practicing for months. This ability to remember and execute the piano piece without recent practice involves which part of the brain? (An)

- ☒ **A** Cerebrum ✓✓
- ☐ **B** Cerebellum ✗
- ☐ **C** Medulla ✗
- ☐ **D** Hypothalamus ✗

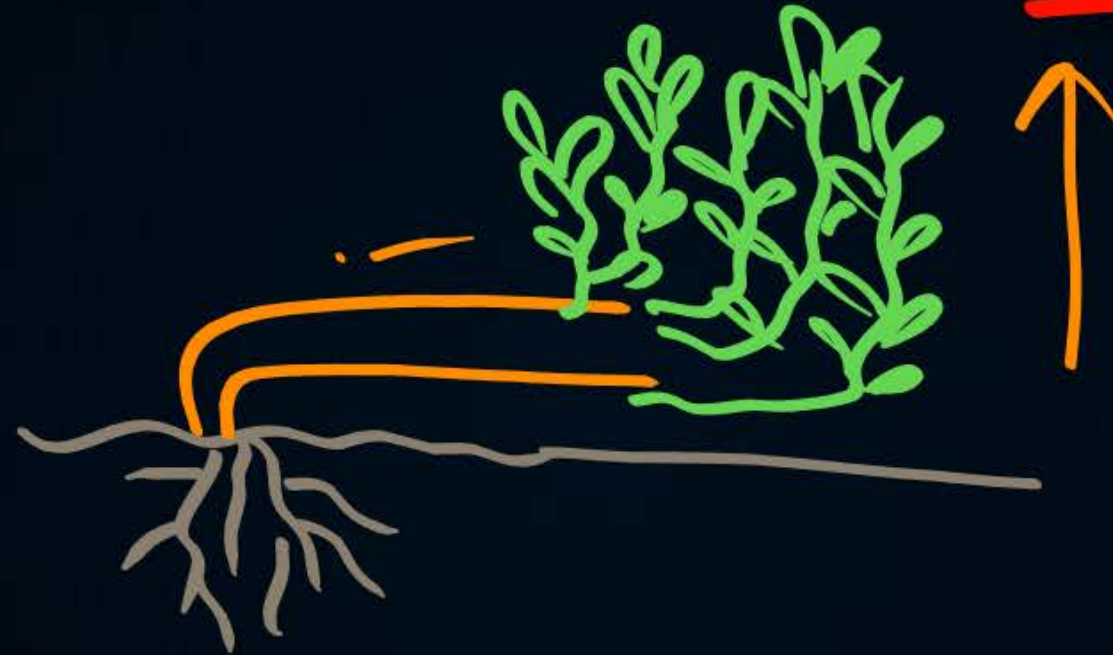
QUESTION

✓ Q.4



A big tree falls in a forest, but its roots are still in contact with the soil. The branches of this fallen tree grow straight up (vertically). This happens in response to: (Un)

- A** Water
- B** Minerals
- C** Gravity
- D** Light



QUESTION

H.Q ✓ Q.5



The main function of abscisic acid in plants is to (Re) (NCERT Exemplar)

- A** Increase the length of cells. *Auxin*
 Growth inhibiting hormone
- B** Promote cell division. *[cytokinin]*
- C** Inhibit growth. ✓
- D** Promote growth of stem. *Gibberellin*

QUESTION

✓ Q-6



Select from the following the correct statement about tropic movement in plants:
(Re) (CBSE, 2023)

- A** It is due to stimulus of touch and temperature. ✗
- B** It does not depend upon the direction of stimulus received. ✗
- C** It is observed only in roots and not in stems. ✗
- D** It is a growth related movement. ✓

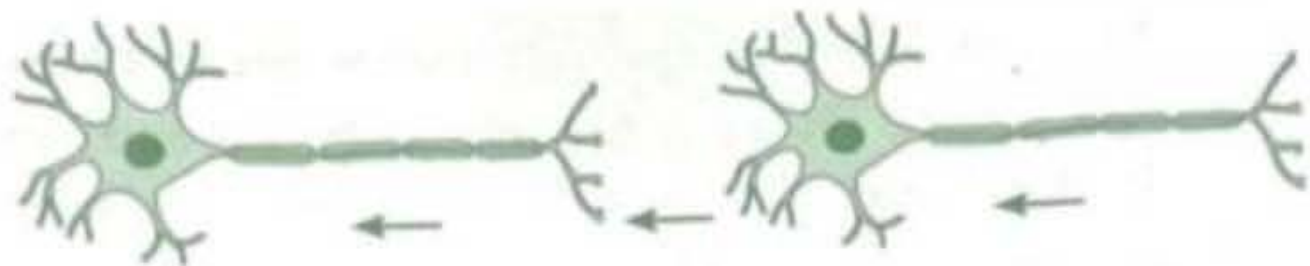
QUESTION

✓ Q.7

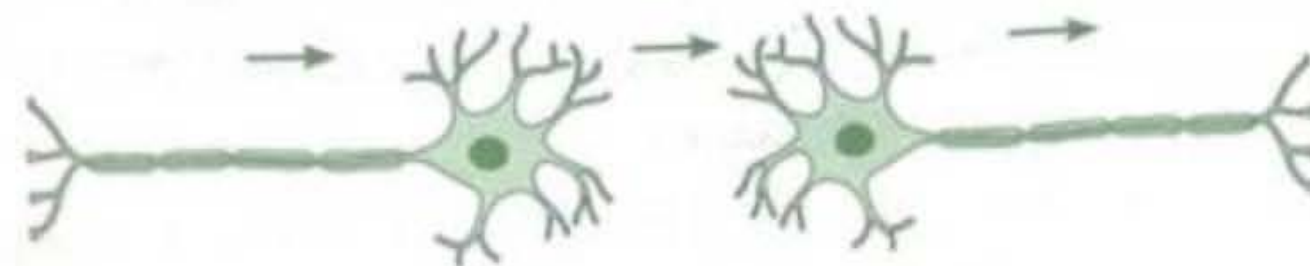


What is the correct direction of flow of electrical impulses?
(An) (NCERT Exemplar)

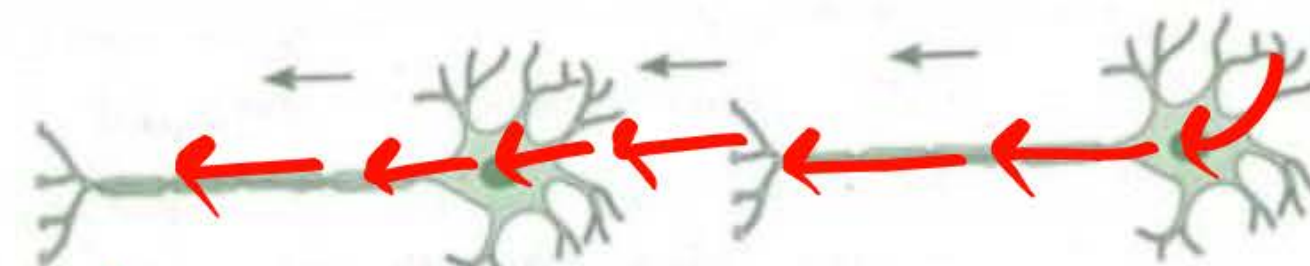
A



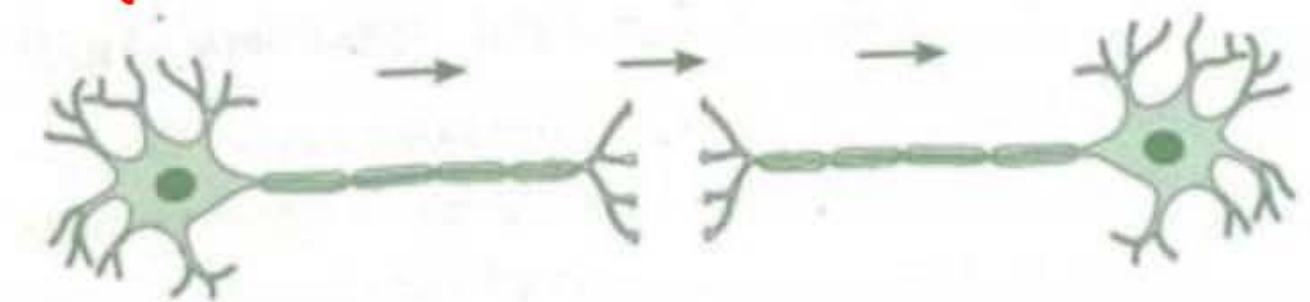
B



C



D



QUESTION

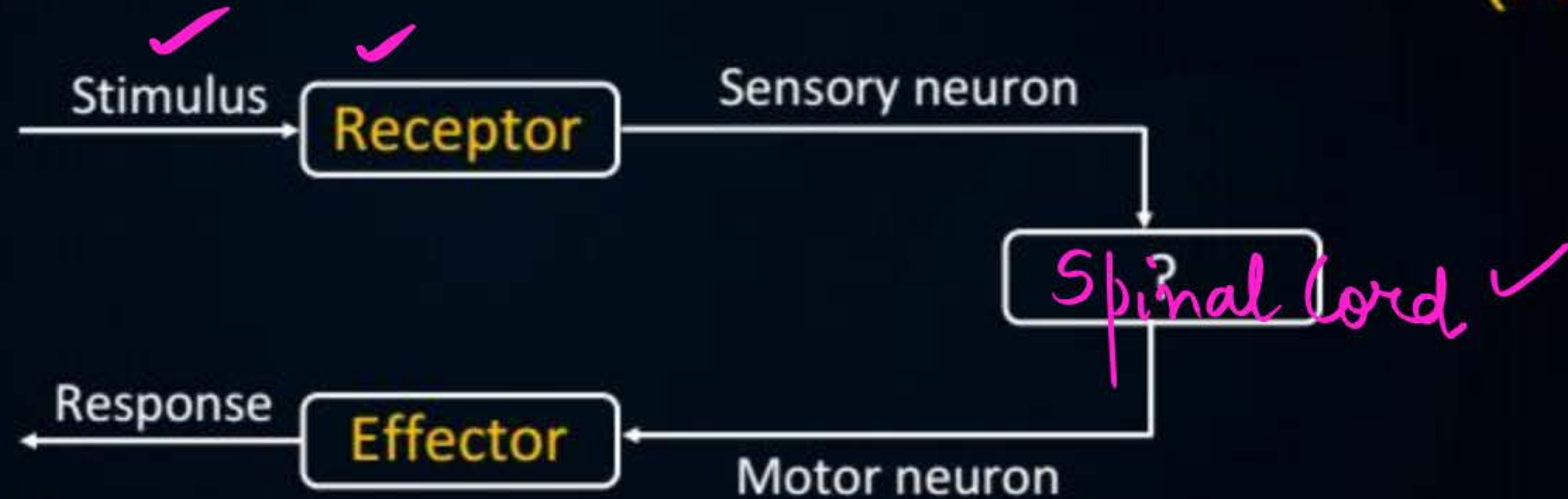
✓ Q.8



While walking, you accidentally stepped on a sharp stone. You quickly jumped away as a response. Examine the diagram showing the series of actions taking place in the body and identify the missing term (?).

(An)

- ☒ **A** Spinal cord
- ☐ **B** Brain
- ☐ **C** Cranial nerve
- ☐ **D** PNS



QUESTION

✓ Q.9



Sarah accidentally touches a hot stove while cooking. She quickly withdraws her hand from the stove without consciously thinking about it. Explain the nature of this response and choose the correct option. (An)

- A** A conscious response to changes in the environment. ✗
- B** An unconscious response to changes in the environment. ✓
- C** A response that involves thinking about the situation. ✗
- D** A response that involves feeling in control of our reactions.

QUESTION

✓ Q. 10



Which of the following statements is correct about receptors?
(Re) (NCERT Exemplar)

☒ **A** Gustatory receptors detect taste while olfactory receptors detect smell.

☐ **B** Both gustatory and olfactory receptors detect smell.

aaaaaa!

☐ **C** Auditory receptors detect smell and olfactory receptors detect taste.

☐ **D** Olfactory receptors detect taste and gustatory receptors smell.

QUESTION



✓ Q-11

Which of the following statements are true? (Re) (NCERT Exemplar)

- (i) ✓ Sudden action in response to something in the environment is called reflex action.
- (ii) ✗ Sensory neurons carry signals from the spinal cord to muscles.
- (iii) ✗ Motor neurons carry signals from receptors to the spinal cord.
- (iv) ✓ The path through which signals are transmitted from a receptor to a muscle or a gland is called a reflex arc.

A (i) and (ii)

B (i) and (iii)

✓ **C** (i) and (iv)

D (i), (ii) and (iii)

QUESTION



Considering the hormone insulin, which of the following statement is correct?

↳ decreases blood glucose levels (Re)

A It decrease blood glucose level by breaking down glycogen in the liver. X

B ✓ It decreases blood glucose level by facilitating cellular uptake of glucose.

C Insulin secretion decreases when blood glucose levels are high. ↑↑↑ X

D Insulin stimulates the conversion of excess glucose into proteins. X

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Assertion- Reason Questions

QUESTION

✓ Q-12 ✓



Assertion (A) : Phototropism is the plant movement towards light. (Re)

Reason (R) : Root shows negative phototropism. ✓

- 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.

QUESTION

✓ Q.13



Assertion (A) : Reflex action has a very fast response that takes place without thinking. ✓✓ (Un)

Reason (R) : Reflex action is controlled by the spinal cord. ✓✓

- 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.

QUESTION

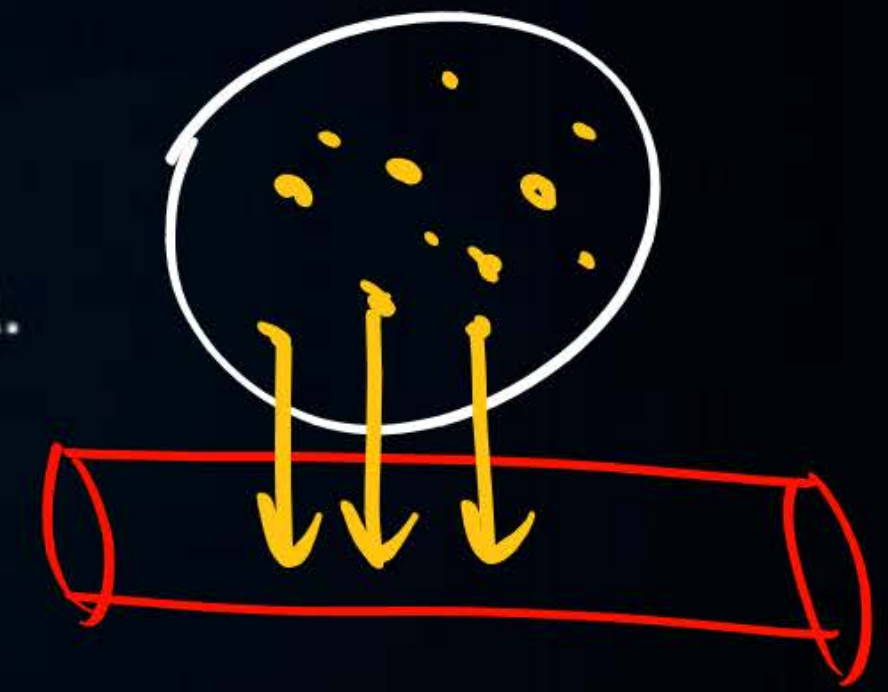


Q.14

Assertion (A) : Endocrine glands send their secretions directly into the bloodstream. ✓✓

Reason (R) : Endocrine glands are ductless glands. ✓✓

- 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.



Samvidhi bookie



14/14

- More than 10 ✓
- 6-10 ✓
- below 6

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[Top Ten]

Subjective Questions

QUESTION



You've likely noticed how drunk individuals have trouble walking in a straight line. Why do you think that happens?

✓ Cerebellum

Solution



Alcohol affects the cerebellum, a brain part responsible for coordinating muscles movements. When the cerebellum is impaired by alcohol, it leads to difficulties in maintaining balance, making it hard for drunk individuals to walk straight.

QUESTION



Why is chemical communication better than electrical impulses as a means of communication between cells in a multicellular organism.

(Un) (CBSE, 2020) ✓

↳ Nervous Tissue
(Neuron) →

Chemical communication is a better means of communication than electrical impulses because:

1. **It is mediated through hormones:** Hormones can diffuse to different regions of the body, thereby allowing cells to communicate even without interacting with each other and can be maintained at a steady rate and easily regulated.
2. It doesn't require specialized tissue like nervous tissue used in electrical impulses.
3. **Provide widespread communication:** Unlike electrical impulses, which are region-specific and limited to specific areas connected by nerves, chemical communication occurs throughout the body.

QUESTION

Voluntary
action

Reflex action



- (a) Sheila saw a snake and instantly jumped back. She then slowly moved away from the snake. What is the difference between these two actions?
- (b) 'Brain and spinal cord are two vital organs of our body.' How is our body designed to protect them? (An, Un)

- (a) Sheila's instant jump back is a reflex action, a quick, automatic response to a stimulus that does not involve conscious thought, primarily for protection and is mediated by the spinal cord. Whereas, slowly moving away involves voluntary action, which is a conscious, deliberate movement where she decides to avoid the snake, showing control and coordination of muscles after processing the situation.
- (b) The brain is enclosed within a protective bony enclosure called the skull or cranium and is surrounded by a fluid-filled sac that shields it from shocks. The spinal cord is safeguarded by the vertebral column.



QUESTION



Stimulus

How is an electric impulse created in the human nervous system? Identify the parts of a neuron which helps the nerve impulse to travel: (Re)

- (a) Towards the cell body → Dendrite → Cell body
- (b) Away from the cell body

↓
Axon

A nerve impulse is generated when the stimulus triggers the receptors present in the sensory organs, causing electrical and chemical changes in the neuron. This impulse then travels through and across neurons as an electrical or chemical signal, effectively transmitting essential information and responses.

The part of the neuron:

- (a) Which helps the nerves impulse to travel towards the cell body is dendrite.
- (b) Which helps the nerve impulse to travel away from the cell body is axon.

QUESTION



Name the glands and the hormone secreted by the gland, which are associated with the following problems: (Re)

- (i) A girl has impaired immunity.
- (ii) A woman has a menstrual irregularities.

WBC

Thymosin

Oestrogen

Solution

- (i) Thymus → Thymosin
- (ii) Ovary → Oestrogen, Progesterone

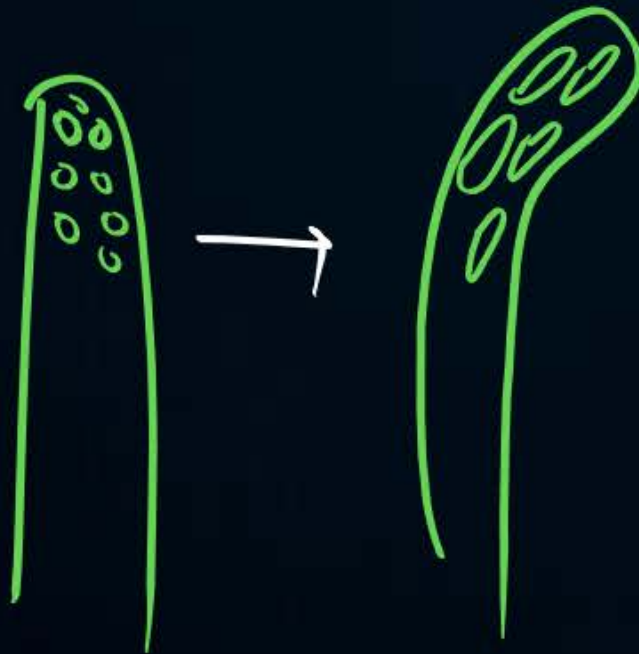


QUESTION



Auxin → Tip of Shoot

- (a) Name the hormone which is secreted when growing plants detect light. Mention its site of secretion in a plant. (Re)
- (b) Explain why do plants appear to bend towards light.



cell elongation → Auxin

Solution



- (a) Auxin hormone is secreted in the growing plant which detects light. It is present in the tip of the growing stem.
- (b) When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light.

[Nastic Movement]

- (a) Plants do not have any nervous system but yet, if we touch a sensitive plant, some observable changes take place in its leaves. Explain how could this plant respond to the external stimuli and how it is communicated.
- (b) Name the hormone that needs to be administered to
- (i) increase the height of a dwarf plant. → (GA)
 - (ii) cause rapid cell division in fruits and seeds. (Ap) (CBSE, 2019)

↳ Cytokinin

- (a) When we touch the compound leaf of the sensitive plant, (*Mimosa pudica*) it collapses and its leaflets fold together. This response occurs due to:
- The change in amount of water in the cell at the region of contact.
 - The external stimulus of touch is communicated by the changes in concentration of ions.
- (b) (i) Gibberellin
(ii) Cytokinin

QUESTION



Given reasons:

- (a) Iodine plays a vital role in thyroid function and growth regulation. (Re) (CBSE, 2023)
- (b) Pancreas helps in digestion and also regulates blood sugar level.
- (c) Endocrine glands secrete hormones in precise quantities rather than in a continuous or unregulated manner. (Re)

→ Thyroxine

→ feedback Mechanism

- (a) Iodine is essential for thyroxin synthesis by the thyroid gland, which regulates fat and carbohydrate metabolism for optimal growth. Deficiency can lead to goitre and metabolic disorders.
- (b) Pancreas acts as mixed gland:
- Exocrine cells secrete digestive enzymes like lipase and trypsin that assist in the digestion of food.
 - Endocrine cells secrete hormones such as insulin and glucagon, which are critical for regulating blood sugar levels.
- (c) Endocrine glands control the body's functions by releasing just the right amount of hormones for:
- **Feedback Regulation:** It accurately modulates hormone secretion in response to stimuli, for example, elevating insulin level when blood sugar rises and reducing it as blood sugar levels decline to a level.
- Health Impact:** Maintaining hormonal balance is vital for health; imbalances can result in various conditions such as goitre, diabetes, dwarfism, and gigantism.

QUESTION

Nervous

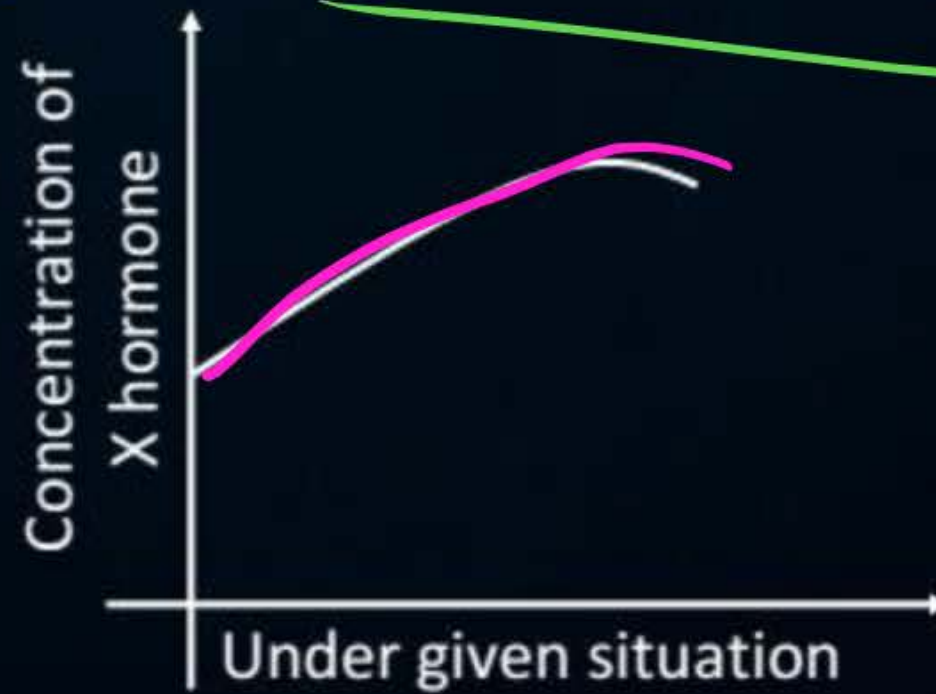
Stressful Situation



Rahul, a 10 year old boy with a fear of public speaking, is asked to give an important speech in front of his entire class. As Rahul begins to speak, his anxiety escalates, and he starts to experience rapid heavy breathing and sweating. Given below is the graphical representation of the hormonal changes in Rahul's body during this challenging situation. Based on your analysis of the graph, respond to the following questions.

(a) Identify the hormone denoted as 'X'.

Adrenaline ✓



Solution



- (a) The hormone denoted as 'X' is adrenaline (also known as epinephrine).

QUESTION



What are the limitations of electric impulse?

The limitations that nerve impulses have are as follows:

- (1) The impulses can move only in one direction. This is because the nerves are structured to allow unidirectional flow.
- (2) The electrical impulses are quite short acting. The message is only sent in the presence of the stimulus

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Common Doubts



→ Auxin

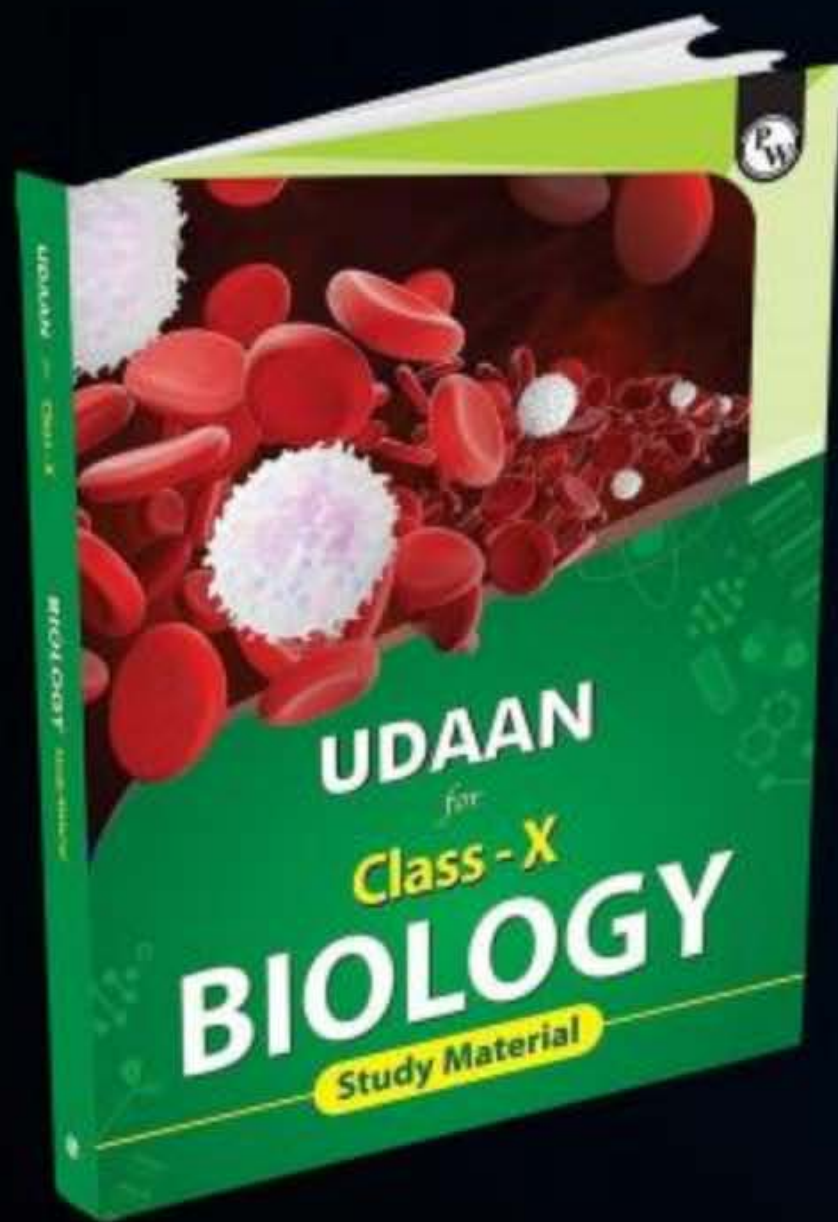
cell division

internode
elongation

GA → Stem elongate

Auxin → Cell elongate

Homework from Udaan Module



FROM PW MODULE
(Udaan - CLASS 10)

PAGE : 101 — Q-31 , Q-32



THANK
YOU

