

CBSE CLASS X
Science (086)

ANSWER KEY

From previous CBSE Board Exam questions

Code: A39EPS **Questions: 67** **Maximum Marks: 147** **Generated: 2026-06-15 13:05****SELECTIONS USED**

Source	Previous-year board
Subject	Science
Lessons	Control and Coordination
Year	2022-2026
Questions selected	67

Composition — Types: 24 MCQ · 16 Short · 13 Very short · 8 Long · 2 Assertion–reason · 2 source_based · 2 Case-based

Q1. § 6.2.2 Movement Due to Growth

[1]

The growth of tendrils in grapes plants is due to :

- (A) Effect of light
- (B) Effect of gravity
- (C) Rapid cell division in tendril cells in contact with the support
- (D) Rapid cell division in tendril cells that are away from the support

Previously asked in: 2026 31/3/1 Q7

♦ **Control and Coordination** Tropic Movements – Thigmotropism

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Model Answer**(D) Rapid cell division in tendril cells that are away from the support****Explanation**

The passage clearly states that the part of the tendril **away from** the object grows more rapidly than the part in contact with the support. This unequal growth causes the tendril to curl and cling. Do not confuse this with phototropism (light) or geotropism (gravity) — it is a thigmotropism-related growth response.

Source: Chapter 6, Section 6.2.2 — Movement Due to Growth

Q2. § 6.2.2 Movement Due to Growth

[1]

Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule from the following options.

- (A) Hydrotropism
- (B) Geotropism
- (C) Chemotropism
- (D) Phototropism

Previously asked in: 2026 31/2/1 Q2

♦ **Control and Coordination** Chemotropism

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Model Answer**(C) Chemotropism**

The growth of the pollen tube towards the ovule is directed by chemical substances, making it an example of chemotropism.

Source: Chapter 6, Section 6.2.2 — Movement Due to Growth

Explanation

The textbook explicitly states: "One example of chemotropism is the growth of pollen tubes towards ovules." Chemotropism is directional growth in response to a chemical stimulus. Students often confuse this with hydrotropism (response to water) or phototropism (response to light). Remember the keyword: **chemical** → **chemotropism**.

Q3. § 6.1 ANIMALS – NERVOUS SYSTEM

[2]

What happens at synapse between two neurons ? State briefly.

Previously asked in: 2023 31/6/1 Q22(b)

♦ Control and Coordination Synapse – transmission of nerve impulse between two neurons

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Model Answer

At a synapse, the electrical impulse travelling along the axon of one neuron triggers the release of **chemicals** at the axon's end. These chemicals cross the gap (synapse) and generate a similar electrical impulse in the **dendrite of the next neuron**, thus transmitting the signal from one neuron to another.

Explanation

Examiners look for two key steps: (1) conversion of electrical impulse → chemical release at axon end, and (2) chemicals crossing the gap → new electrical impulse in next neuron's dendrite. Both steps are needed for full 2 marks. Avoid just saying "signals are passed" – specify the electrical-to-chemical-to-electrical sequence.

Source: Chapter 6, Section 6.1 Animals – Nervous System

Q4. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.2.1 Immediate Response to Stimulus § 6.3 HORMONES IN ANIMALS

[1]

In a nerve cell, the site where the electrical impulse is converted into a chemical signal is known as :

- (a) Axon
- (b) Dendrites
- (c) Neuromuscular junction
- (d) Cell body

Previously asked in: 2024 31/1/1 Q10

♦ Control and Coordination Synapse – conversion of electrical impulse to chemical signal

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Model Answer**(c) Neuromuscular junction**

At the end of the axon, the electrical impulse sets off the release of chemicals that cross the synapse — this junction between a neuron and a muscle cell is the neuromuscular junction.

Source: Chapter 6, Section 6.1

Explanation

The passage states: "At the end of the axon, the electrical impulse sets off the release of some chemicals... A similar synapse finally allows delivery of such impulses from neurons to other cells, such as muscle cells" — this site is the **neuromuscular junction** (shown in Fig. 6.1b). Students often confuse "synapse" with "neuromuscular junction"; remember that a neuromuscular junction is the specific synapse between a motor neuron and a muscle fibre where electrical → chemical conversion enables muscle action.

Q5. § 6.1 ANIMALS – NERVOUS SYSTEM

[1]

The part in which gustatory receptors are present in our body is :

- (a) inner ear
- (b) skin
- (c) tongue
- (d) inner lining of nose

Previously asked in: 2023 31/5/1 Q11

♦ Control and Coordination Gustatory Receptors

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Model Answer**(c) tongue**

Gustatory receptors, which detect taste, are present in the tongue.

Explanation

The passage directly states: "*gustatory receptors will detect taste*" and lists the tongue as one of the sense organs where receptors are located. "Gustatory" means related to taste, so the tongue is the correct answer. Olfactory receptors (for smell) are in the nose — do not confuse the two.

Q6. § 6.1 ANIMALS – NERVOUS SYSTEM

[1]

The sense organ in which olfactory receptors are present is :

- (A) Nose
- (B) Skin
- (C) Tongue
- (D) Inner ear

Previously asked in: 2024 31/5/1 Q8

♦ Control and Coordination Olfactory receptors and the sense of smell (nose)

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Model Answer

(A) Nose

Olfactory receptors detect smell and are located in the nose.

Source: Chapter 6, Section 6.1 – Animals: Nervous System

Explanation

The passage directly states: "*gustatory receptors will detect taste while olfactory receptors will detect smell*," and lists the nose among the sense organs where receptors are located. "Olfactory" relates to smell → nose. This is a straightforward recall question; just write the option and one supporting line.

Q7. § 6.1 ANIMALS – NERVOUS SYSTEM

[1]

In a synapse, the chemical signal is transmitted from :

- (A) Dendritic end of one neuron to axonal end of another neuron.
- (B) Axon to cell body of the same neuron.
- (C) Cell body to axonal end of the same neuron.
- (D) Axonal end of one neuron to dendritic end of another neuron.

Previously asked in: 2026 31/3/1 Q4

♦ Control and Coordination Synapse and Chemical Signal Transmission

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Model Answer

(D) Axonal end of one neuron to dendritic end of another neuron.

Explanation

The textbook states that at the end of the axon, chemicals are released which cross the synapse and start an electrical impulse in the **dendrite of the next neuron**. So transmission is always axon → synapse → dendrite (of next neuron). Option D is the only one that correctly identifies both ends.

Q8. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.1 What happens in Reflex Actions? § 6.2 COORDINATION IN PLANTS

[2]

State two differences between the act of chewing food and salivation on sight of food.

Previously asked in: 2026 31/1/1 Q11(a)

♦ Control and Coordination Reflex action vs voluntary action

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Model Answer

| Chewing food | Salivation on sight of food |

|---|---|

| It is a **voluntary action** controlled consciously by the individual. | It is an **involuntary/reflex action** controlled by the nervous system automatically. |

| It involves **muscular movement** of jaws (mechanical process). | It involves **secretion by salivary glands** triggered by a sensory stimulus (sight). |

Explanation

The key distinction examiners expect is **voluntary vs. involuntary (reflex)** control, and the nature of the action — mechanical (chewing) vs. glandular secretion (salivation). These relate to Chapter 6 concepts of voluntary and reflex actions. Presenting the answer as a comparison table is clean and exam-friendly for a 2-mark difference question.

Q9. § 6.1.2 Human Brain

[3]

In the given diagram

- (i) Name the parts labelled A, B, and C.
- (ii) Write the functions of A and C.
- (iii) Reflex arcs have evolved in animals ? Why ?

Previously asked in: 2023 31/6/1 Q29(b)

♦ Control and Coordination

Evolution and Significance of Reflex Arcs in Animals

Functions of Components of Reflex Arc

Reflex Arc – Structure and Components

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Model Answer**(i) Names of labelled parts:**

- A – Sensory nerve fibre (afferent neuron)
- B – Relay/Association neuron (within spinal cord)
- C – Motor nerve fibre (efferent neuron) / effector region

(ii) Functions:

- A (**Sensory nerve**): Carries impulse from the receptor (sense organ/skin) to the spinal cord.
- C (**Motor nerve**): Carries impulse from the spinal cord to the effector (muscle), causing response.

(iii) Reflex arcs have evolved because they allow animals to respond **immediately** to dangerous stimuli (like heat or pain) without waiting for the brain to process information. This quick, involuntary response protects the body from harm and increases survival chances.

Explanation

- Part (i) is pure labelling — one mark for all three names.
- Part (ii) asks for functions of A and C only (not B) — state direction of impulse transmission clearly.
- Part (iii): Emphasise **speed/survival advantage** — examiners expect the idea that brain involvement takes time, so spinal reflex arcs evolved for faster protective responses. Avoid vague answers.

Q10. § 6.1.1 What happens in Reflex Actions? § 6.1.2 Human Brain

[3]

Define reflex action. With the help of a flow chart show the path of a reflex action such as sneezing.

Previously asked in: 2024 31/1/1 Q30

♦ Control and Coordination

Reflex Action and Reflex Arc

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Model Answer

Reflex action: It is a spontaneous, automatic and immediate response to a stimulus that does not involve thinking. It is controlled by the spinal cord through a reflex arc.

Path of reflex action (sneezing):

Stimulus (irritant in nose) → Receptor (sensory cells in nose) → Sensory nerve → Spinal cord (reflex arc) → Motor nerve → Effector

Source: Chapter 6, Section 6.1.1 — What happens in Reflex Actions?

Explanation

- **Definition** fetches 1 mark: include key words — *sudden/automatic, without thinking, response to stimulus*.
- **Flow chart** fetches 2 marks: must show all five steps — stimulus → receptor → sensory nerve → spinal cord → motor nerve → effector → response. Missing any node loses a mark.
- Examiners accept a linear arrow diagram (as above) or a box-and-arrow chart; both are valid.
- The role of the **spinal cord** (not the brain) in completing the arc is essential to mention.

Q11. § 6.1.1 What happens in Reflex Actions? § 6.1.2 Human Brain § 6.1.4 How does the Nervous Tissue cause Action?

[5]

Answer the following about voluntary action and reflex action.

- (a) Differentiate between voluntary and involuntary action.
- (b) Define reflex action. With the help of a flow diagram, show the correct sequence of path of Nerve impulse from place of its origin.

Previously asked in: 2025 31/5/1 Q35 (B)

♦ Control and Coordination Reflex Action and Reflex Arc Voluntary vs Involuntary Actions

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Model Answer**(a) Voluntary vs. Involuntary Action:**

| Voluntary Action | Involuntary Action |

|---|---|

| Controlled by thinking; decision is made consciously. | Occurs without conscious thought or control. |

| Controlled by the fore-brain. | Controlled by mid-brain and hind-brain (medulla). |

| Examples: writing, walking, clapping. | Examples: heartbeat, salivation, blood pressure. |

(b) Reflex Action:

Reflex action is a sudden, automatic response to a stimulus that occurs without conscious thinking. It is a quick response controlled by the spinal cord through a reflex arc.

Flow diagram of the nerve impulse path:

Stimulus → Receptor → Sensory Nerve → Spinal Cord (Reflex Arc) → Motor Nerve → Effector (Muscle) → Response

(Information also travels from the spinal cord to the brain, but the response is initiated at the spinal cord itself.)

Source: Chapter 6, Sections 6.1.1 and 6.1.2

Explanation

- **(a):** Examiners expect at least 2–3 clear points of difference, ideally in a table. Key distinction: voluntary = brain (fore-brain) + thinking; involuntary = mid/hind-brain, no thinking.
- **(b):** Define reflex action clearly (sudden, without thinking, via spinal cord). The flow diagram must show the correct sequence: Stimulus → Receptor → Sensory nerve → Spinal cord → Motor nerve → Effector → Response. Many students forget to mention that the impulse *also* reaches the brain, but the *response* originates at the spinal cord — include this for full marks.

Q12. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.1 What happens in Reflex Actions?

[1]

The correct sequence of events that occur when a person unknowingly touches a hot object is :

- (A) Receptors in skin → Relay neuron → Sensory neuron → Motor neuron → Effector muscle in arm
- (B) Receptors in skin → Sensory neuron → Relay neuron → Motor neuron → Effector muscle in arm
- (C) Receptors in skin → Sensory neuron → Relay neuron → Motor neuron → Effector muscle in arm
- (D) Receptors in skin → Sensory neuron → Motor neuron → Relay neuron → Effector muscle in arm

Previously asked in: 2024 31/5/1 Q7

♦ Control and Coordination Reflex Arc and Sequence of Reflex Action

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Model Answer**(B)** Receptors in skin → Sensory neuron → Relay neuron → Motor neuron → Effector muscle in arm**Explanation**

This is a reflex arc. The correct order is: receptor detects stimulus → sensory neuron carries impulse to spinal cord → relay neuron (in spinal cord) connects them → motor neuron carries impulse to muscle → effector responds. Options (A) and (D) have incorrect sequences; (B) and (C) appear identical — (B) is the standard correct answer. Source: Chapter 6, Section 6.1.1.

Q13. § 6.1.2 Human Brain

[5]

- (i) Define a reflex arc. Why have reflex arcs evolved in animals? Trace the sequence of events which occur, when you suddenly touch a hot object.
 (ii) Name the part of nervous system which helps in communication between the central nervous system and other parts of the body. What are the two components of this system?

Previously asked in: 2024 31/4/1 Q35 (a)

◆ **Control and Coordination** Peripheral Nervous System and its Components (Somatic and Autonomic Nervous System)
 Reflex Arc – Definition, Evolution, and Sequence of Events

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Model Answer**(i) Reflex Arc:**

A reflex arc is the pathway taken by a nerve impulse during a reflex action — from receptor to effector without involving the brain. It is formed in the spinal cord itself.

Why evolved: Reflex arcs evolved because the brain's thinking process is too slow for urgent situations. Even animals with little or no complex neuron networks need quick responses to danger.

Sequence of events when touching a hot object:

1. Heat receptors in the skin (dendrite tips) detect the stimulus.
2. An electrical impulse travels along the sensory neuron to the spinal cord.
3. The spinal cord (reflex arc) relays the impulse via a relay neuron to the motor neuron.
4. The motor neuron carries the impulse to the muscle (effector).
5. The muscle contracts and the hand is pulled away. Simultaneously, the information also reaches the brain (we feel pain).

(ii) The Peripheral Nervous System (PNS) facilitates communication between the central nervous system and other parts of the body.

Two components:

- **Cranial nerves** — arising from the brain
- **Spinal nerves** — arising from the spinal cord

Source: Chapter 6, Sections 6.1, 6.1.1, 6.1.2

Explanation

- Part (i) carries ~3 marks: definition (1) + reason for evolution (1) + sequence (1). List the sequence as numbered steps — examiners follow them point by point.
- Part (ii) carries ~2 marks: name the PNS (1) + both components (1). Don't just say "nerves"; specify cranial and spinal nerves.
- The key phrase for reflex arc definition is "pathway of nerve impulse from receptor to effector through spinal cord, bypassing the brain."
- Always mention that the information *also reaches the brain* — this is a common detail students miss.

Q14. § 6.1.2 Human Brain

[1]

Assertion (A) : In our actions of writing or talking, our nervous system communicates with the muscles.

Reason (R) : Cranial nerves and spinal nerves form the peripheral nervous system.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
 (C) Assertion (A) is true, but Reason (R) is false.
 (D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 31/3/1 Q18

◆ **Control and Coordination** Nervous system communicating with muscles (voluntary actions) Peripheral nervous system – cranial and spinal nerves

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Model Answer

(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A). The brain sends messages to muscles via the nervous system for voluntary actions; the PNS definition is a separate fact.

Explanation

- **A is true:** The textbook states that for actions like writing and talking, "the brain also has to send messages to muscles" — this is the second way the nervous system communicates with muscles.
- **R is true:** The textbook explicitly states "the peripheral nervous system consisting of cranial nerves arising from the brain and spinal nerves arising from the spinal cord."
- **R does NOT explain A:** The PNS definition (R) merely names the components; it does not explain *why* or *how* the nervous system communicates with muscles during voluntary actions. Hence option **(B)**.

Q15. § 6.3 HORMONES IN ANIMALS

[2]

Electrical impulse is an excellent means to transmit information in the animal body, but there are some limitations to the use of electrical impulses. State any two limitations.

Previously asked in: 2026 31/2/1 Q10 (b)

♦ **Control and Coordination** Limitations of electrical impulse as a means of information transmission

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Model Answer

Two limitations of electrical impulses for transmitting information:

1. **Limited reach:** Nerve impulses can only instruct tissues directly connected by nerve cells. They cannot reach every cell in the body, so the range of tissues that can be coordinated is limited.
1. **Wide-ranging changes not possible:** If the body relied only on electrical impulses, it could not bring about the broad, body-wide changes (e.g., preparing muscles, heart, lungs simultaneously) needed in complex situations like fight-or-flight responses.

Source: Chapter 6, Section 6.3 — Hormones in Animals

Explanation

The textbook explicitly states: *"If the body design relied only on electrical impulses via nerve cells, the range of tissues instructed to prepare for the coming activity would be limited."* Examiners expect both points — limited reach (only nerve-connected tissues) and inability to cause wide-ranging/body-wide changes. Avoid vague answers; use the context of the fight-or-flight example to support your points.

Q16. § 6.1.2 Human Brain § 6.1.4 How does the Nervous Tissue cause Action?

[1]

Give differences between the following : Sensory nerve and motor nerve

Previously asked in: 2026 31/1/1 Q14 (b)

♦ **Control and Coordination** Sensory neuron vs motor neuron

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Model Answer

Sensory nerve: Carries impulses from receptors/sense organs to the central nervous system (brain/spinal cord).

Motor nerve: Carries impulses from the central nervous system to effectors (muscles/glands).

Explanation

For a 1-mark difference question, one clear contrasting point is sufficient. Examiners look for the direction of impulse travel — sensory nerves carry impulses *towards* the CNS, motor nerves carry impulses *away from* the CNS. Avoid writing extra points; one sharp contrast earns full marks.

Q17. § 6.1.1 What happens in Reflex Actions? § 6.1.2 Human Brain

[1]

Assertion (A) : Reflex actions do not involve thinking.

Reason (R) : Most reflex actions are controlled by the spinal cord.

- A Both, Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
 B Both, Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
 C Assertion (A) is true, but Reason (R) is false.
 D Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2026 31/1/1 Q8

♦ **Control and Coordination** Reflex Action and Reflex Arc

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Model Answer

Option A is correct. Both A and R are true, and R is the correct explanation of A. Reflex actions do not involve thinking because they are processed in the spinal cord (reflex arc), bypassing the brain.

Explanation

The textbook states that reflex arcs are formed in the spinal cord itself, allowing quick responses without involving the brain's thinking process. Since the spinal cord handles reflex actions, thinking (a brain function) is not required — making R the correct explanation of A.

Q18. § 6.1.2 Human Brain

[1]

Human brain has various parts or regions that help in different actions, responses and coordination. From the following, identify the part responsible for precision of voluntary actions :

- A Cerebrum
- B Cerebellum
- C Medulla
- D Pons

Previously asked in: 2026 31/1/1 Q4

♦ Control and Coordination Human brain – parts and functions (cerebellum: precision of voluntary actions)

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Model Answer**B) Cerebellum**

The cerebellum, a part of the hind-brain, is responsible for precision of voluntary actions and maintaining posture and balance of the body.

Source: Chapter 6, Section 6.1.2 Human Brain

Explanation

The textbook explicitly states: "a part of the hind-brain called the cerebellum... is responsible for precision of voluntary actions and maintaining the posture and balance of the body." Do not confuse cerebellum (precision/balance) with cerebrum/fore-brain (thinking/voluntary initiation) or medulla (involuntary actions like blood pressure, vomiting).

Q19. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.1 What happens in Reflex Actions?

[2]

Sunil unconsciously touched the hot iron rod and immediately withdrew his hand. Which type of action is involved ? Also define this action. Draw a flow chart to show the path followed for this action.

Previously asked in: 2026 31/4/1 Q12 (B)

♦ Control and Coordination Reflex Action and Reflex Arc

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Model Answer

Type of Action: Reflex action

Definition: A reflex action is a spontaneous, automatic, and rapid response to a stimulus that occurs without conscious thinking, controlled by the spinal cord.

Flow Chart (Reflex Arc):

Hot iron rod (Stimulus) → Receptor (skin) → Sensory nerve → Spinal cord (nerve centre) → Motor nerve → Effector (muscle) → H

Source: Chapter 6, Section 6.1.1 – Reflex Actions

Explanation

- Examiners expect **three things**: name of action, definition, and flow chart — all in one question.
- The flow chart must show the **reflex arc pathway**: receptor → sensory nerve → spinal cord → motor nerve → effector/muscle → response. Do NOT say the signal goes to the brain first; reflex arcs are processed in the **spinal cord**.
- Definition should mention: **involuntary/without conscious thinking, sudden**, controlled by **spinal cord**.
- Using arrows in the flow chart is important for full marks.

Q20. § 6.1.2 Human Brain § 6.1.3 How are these Tissues protected? § 6.1.4 How does the Nervous Tissue cause Action?

[3]

Answer the following:

- (a) List two constituents of Central Nervous System (CNS). How are these components protected from injuries ?
- (b) Write two limitations of the use of electrical impulses.

Previously asked in: 2024 31/3/1 Q30

♦ Control and Coordination

Central Nervous System (CNS) – components and protection

Limitations of electrical impulses as a means of communication in the body

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Model Answer

(a) The two constituents of the Central Nervous System (CNS) are:

1. **Brain**
2. **Spinal cord**

Protection: The brain is protected by a hard bony box called the **cranium**, and the spinal cord is protected by the **vertebral column**. Both are further enclosed in three membranous layers called **meninges**.

(b) Two limitations of electrical impulses:

1. Electrical impulses can reach only those cells that are connected by nervous tissue — **not all cells** in the body are connected this way.
2. Once an impulse is delivered and the response is complete, the cell takes time to reset; thus, it **cannot continuously transmit** impulses.

Explanation

- Part (a) is standard 2-mark content from the Control and Coordination chapter — always name both CNS components and mention both cranium and vertebral column for full marks. Mentioning meninges adds accuracy.
- Part (b) tests why chemical coordination (hormones) is also needed. Examiners expect limitations related to *reach* and *continuity/speed for long-term responses*. These are the textbook-stated reasons for needing a chemical communication system alongside the nervous system.

Q21. § 6.1.3 How are these Tissues protected?

[2]

Answer the following about the human brain.

- (a) How is brain protected in our body ?
- (b) A doctor finds in one of his patients that he is not maintaining a proper posture and balance of his body. State the region of brain and also the part of brain which is responsible for it.

Previously asked in: 2025 31/6/1 Q22

♦ Control and Coordination

Cerebellum – Role in Posture and Balance

Protection of the Brain (Skull and Cerebrospinal Fluid)

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Model Answer

(a) The brain is protected by a **bony box** (cranium/skull). Inside the skull, the brain is enclosed in a **fluid-filled balloon** which provides shock absorption. The spinal cord is protected by the **vertebral column**.

(b) The region responsible is the **hind-brain**. The specific part is the **cerebellum**, which is responsible for maintaining posture and balance of the body.

Source: Chapter 6, Section 6.1.2 and 6.1.3

Explanation

- For part (a), mention **both** layers of protection — the bony skull AND the fluid-filled balloon — to score full marks. Many students forget the fluid-filled balloon.
- For part (b), examiners expect **both** the region (hind-brain) **and** the specific part (cerebellum). Writing only one will cost you marks. The exact NCERT phrase "posture and balance" should be used.

Q22. § 6.1.2 Human Brain

[1]

Which among the following is not a neural action controlled by the part of human brain labelled 'X' in the figure above?

- A Salivation
- B Hunger
- C Vomiting
- D Blood Pressure

Previously asked in: 2025 31/5/1 Q9

♦ Control and Coordination Parts of the Human Brain and their Functions

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Model Answer

The answer is **(B) Hunger**.

'X' points to the medulla (hind-brain), which controls involuntary actions — blood pressure, salivation, and vomiting. Hunger is controlled by the **fore-brain**.

Source: Chapter 6, Section 6.1.2 Human Brain

Explanation

The passage explicitly states: "All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain." It also states that the sensation of hunger is associated with "a centre... in a separate part of the fore-brain." So hunger is the odd one out — eliminate it as the answer. In MCQs like this, identify which option belongs to a *different* brain region than the one labelled.

Q23. § 6.1.2 Human Brain

[2]

(A) Name the part of brain which is responsible for the following actions :

- (i) Maintaining posture and balance
- (ii) Beating of heart
- (iii) Thinking
- (iv) Blood pressure

Previously asked in: 2023 31/4/1 Q22 (A)

♦ Control and Coordination Parts of the Brain and their Functions

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Model Answer

- (i) **Cerebellum** (part of hind-brain) — maintains posture and balance of the body.
- (ii) **Medulla** (part of hind-brain) — controls involuntary actions like beating of heart.
- (iii) **Fore-brain** — it is the main thinking part of the brain.
- (iv) **Medulla** (part of hind-brain) — controls blood pressure.

Source: Control and Coordination, Section 6.1.2 Human Brain

Explanation

- The question tests knowledge of the three main brain regions and their specific functions.
- Cerebellum → posture/balance/precision of voluntary actions.
- Medulla (hind-brain) → all involuntary actions: heartbeat, blood pressure, salivation, vomiting.
- Fore-brain → thinking, sensory interpretation, voluntary muscle control.
- Note: Both (ii) and (iv) have the **same answer — Medulla**; don't be confused. Examiners expect this.

Q24. § 6.1.3 How are these Tissues protected?

[1]

The part of the brain which maintains the posture and balance of the body is :

- (A) Pons
- (B) Cerebrum
- (C) Cerebellum
- (D) Medulla

Previously asked in: 2025 31/3/1 Q7

♦ Control and Coordination

Parts of the Brain and their Functions – Cerebellum

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Model Answer**(C) Cerebellum**

The cerebellum, a part of the hind-brain, is responsible for precision of voluntary actions and maintaining the posture and balance of the body.

Source: Human Brain, Chapter 6

Explanation

The passage clearly states: "*a part of the hind-brain called the cerebellum... is responsible for precision of voluntary actions and maintaining the posture and balance of the body.*" Medulla controls involuntary actions like blood pressure; cerebrum (fore-brain) handles thinking; pons is not discussed in this context. Cerebellum is the only correct answer.

Q25. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.2 Human Brain § 6.1.3 How are these Tissues protected?

[1]

Following are the statements about the different parts of the brain. Select the correct statements.

- (i) The thinking part of the brain is the forebrain.
- (ii) Centres for smell, hearing, memory, sight are located in forebrain.
- (iii) Salivation, vomiting, blood pressure are controlled by medulla in the hind brain.
- (iv) Cerebellum does not control the posture and balance of the body.

- (A) (i), (ii) and (iii)
- (B) (ii), (iii) and (iv)
- (C) (i), (ii) and (iv)
- (D) (i), (iii) and (iv)

Previously asked in: 2026 31/4/1 Q5

♦ Control and Coordination

Human Brain (Forebrain, Midbrain, Hindbrain)

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Model Answer**(A) (i), (ii) and (iii)**

Statements (i), (ii), and (iii) are correct. Statement (iv) is false because cerebellum **does** control posture and balance.

Source: Chapter 6, Section 6.1.2 Human Brain

Explanation

- Statement (iv) is clearly wrong — the textbook states cerebellum **is** responsible for maintaining posture and balance. Eliminating it instantly rules out options B, C, and D.
- Statements (i), (ii), and (iii) are directly supported: forebrain = thinking part; forebrain has centres for smell, hearing, sight, memory; medulla (hind-brain) controls salivation, vomiting, blood pressure.
- In MCQs, identify the **false statement** first to eliminate wrong options quickly.

Q26. § 6.1.1 What happens in Reflex Actions?

[4]

In life there are certain changes in the environment called 'stimuli' to which we respond appropriately. Touching a flame suddenly is a dangerous situation for us. One way is to think consciously about the possibility of burning and then moving the hand. But our body has been designed in such a way that we save ourselves from such situations immediately.

Read the source and answer the questions that follow.

- (i) Name the action by which we protect ourselves in the situation mentioned above and define it. [1]
 (ii) Write the role of (a) motor and (b) relay neuron. [1]
 (iii) What are the two types of nervous system in human body? Name the components of each of them. [2]

Previously asked in: 2025 31/4/1 Q38

◆ Control and Coordination Central and Peripheral Nervous System – Components Reflex Action and Reflex Arc Types of Neurons – Motor and Relay Neuron

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Model Answer

(i) The action is called **Reflex Action**. It is a spontaneous, automatic, and involuntary response to a stimulus that occurs without conscious thinking.

(ii)

- (a) **Motor neuron**: Carries impulse from the spinal cord/brain to the effector (muscle or gland).
- (b) **Relay neuron**: Connects the sensory neuron to the motor neuron within the spinal cord.

(iii) The two types of nervous system are:

1. **Central Nervous System (CNS)** — Components: Brain and Spinal Cord.
2. **Peripheral Nervous System (PNS)** — Components: Cranial nerves (arising from brain) and Spinal nerves (arising from spinal cord).

Source: Chapter – Control and Coordination, Nervous System

Explanation

- (i) Examiners expect both the name and a one-line definition for 1 mark.
- (ii) Many students confuse motor and relay neurons — remember: relay connects, motor acts.
- (iii) A common mistake is listing only CNS. Always name **both** systems and their components separately. Each system with components earns 1 mark each.

Q27. § 6.2 COORDINATION IN PLANTS § 6.2.2 Movement Due to Growth

[1]

Select from the following the correct statement about tropic movement in plants :

- (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.

Previously asked in: 2023 31/1/1 Q11

◆ Control and Coordination Tropic Movements in Plants

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Model Answer

(d) It is a growth related movement.

Tropic movements are directional growth movements in plants in response to an external stimulus (light, gravity, water, etc.), where the direction of movement depends on the direction of the stimulus.

Source: Chapter 6, Section 6.2 – Coordination in Plants / Movement Due to Growth

Explanation

- Option (a) is wrong — touch causes nastic/seismonastic movement (e.g., Mimosa), not tropic movement; temperature is not the primary stimulus for tropism.
- Option (b) is wrong — tropic movement **does** depend on the direction of stimulus (that is what makes it "directional").
- Option (c) is wrong — both roots and stems show tropic movements (e.g., shoots bend towards light, roots away from light).
- Option (d) is correct — the textbook explicitly states: "*The directional movement of a seedling is caused by growth*" and "*these directional, or tropic, movements*" are growth-related.

Key term to remember: Tropic movements = directional + growth-dependent + stimulus-directed.

Q28. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[2]

How is the movement of leaves of a sensitive plant different from the downward movement of the roots ?

Previously asked in: 2024 31/1/1 Q23(A)

♦ Control and Coordination

Tropic vs. Nastic movements – touch-sensitive plant (Mimosa pudica) vs. geotropism in roots

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Model Answer

The movement of leaves of a sensitive plant is **independent of growth** — cells change shape by losing water, causing leaves to fold rapidly in response to touch.

The downward movement of roots is a **growth-dependent** movement (geotropism) — roots grow downward in response to gravity, and if growth is prevented, this movement will not occur.

Source: Chapter 6, Section 6.2 – Coordination in Plants

Explanation

Examiners look for two clear contrasting points:

1. Sensitive plant movement = **not due to growth** (change in water content of cells).
2. Root movement = **due to growth** (geotropic/directional growth).

Label or contrast these explicitly. Avoid writing lengthy paragraphs — two focused sentences earn full marks here. The key terms are "growth-independent" and "growth-dependent" (or geotropism).

Q29. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[1]

Observe the given figures A and B. When chhui-mui (sensitive) plant is touched, its leaves fold. This is due to :

- (A) Hormonal effect
- (B) Thermal effect
- (C) Change in amount of water in cells
- (D) Electromagnetic effect

Previously asked in: 2025 31/2/1 Q8

♦ Control and Coordination

Nastic movements in plants – Touch-sensitive response of Mimosa pudica (chhui-mui)

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Model Answer**(C) Change in amount of water in cells**

When chhui-mui is touched, plant cells change shape by changing the amount of water in them, causing swelling or shrinking, which results in the leaves folding.

Source: Chapter 6, Section 6.2.1 – Immediate Response to Stimulus

Explanation

The textbook explicitly states: "plant cells change shape by changing the amount of water in them, resulting in swelling or shrinking." This is not a hormonal response (hormones cause slow, growth-related movements like bending towards light). The movement of the sensitive plant is rapid and growth-independent — remember this distinction for both MCQs and short-answer questions.

Q30. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[1]

The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is :

- (A) Cytokinins
- (B) Gibberellins
- (C) Adrenaline
- (D) Auxins

Previously asked in: 2025 31/1/1 Q9

♦ Control and Coordination

Auxin and Phototropism

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Model Answer

(D) Auxins — Auxin diffuses towards the shady side of the shoot, stimulating cells to grow longer on the side away from light, causing the shoot to bend towards light.

Explanation

The passage directly states: "This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light." Adrenaline is an animal hormone (not a plant hormone), while cytokinins promote cell division and gibberellins promote stem growth — neither causes phototropic bending. Auxin is the correct answer.

Q31. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[1]

A plant growth inhibitor hormone which causes wilting of leaves is called :

- A Auxin
- B Cytokinin
- C Absciscic acid
- D Gibberellin

Previously asked in: 2024 31/4/1 Q7

♦ **Control and Coordination** Plant Growth Inhibitor Hormones – Absciscic Acid (ABA) and Wilting of Leaves

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Model Answer

C — Absciscic acid

Absciscic acid is a plant growth **inhibitor** hormone whose effects include wilting of leaves.

Explanation

The textbook explicitly states: "Absciscic acid is one example of a hormone which inhibits growth. Its effects include wilting of leaves." Auxin and gibberellin promote stem growth; cytokinin promotes cell division — none inhibit growth or cause wilting.

Q32. § 6.2.1 Immediate Response to Stimulus

[2]

List two differences between the movement of leaves of a sensitive plant and the movement of a shoot towards light.

Previously asked in: 2023 31/6/1 Q22(a)

♦ **Control and Coordination** Differences between nastic and tropic movements in plants Nastic movement (Thigmonasty) in sensitive plant (Mimosa pudica)
Tropic movement – Phototropism in shoot

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Model Answer

| Basis | Movement of sensitive plant leaves | Movement of shoot towards light |

| --- | --- | --- |

| Cause | Caused by touch (stimulus) | Caused by light (stimulus) |

| Growth | **Not** dependent on growth; cells change shape by losing/gaining water | **Dependent on growth**; auxin causes unequal growth on two sides of shoot |

In short: sensitive plant movement is growth-independent and rapid, while shoot bending towards light (phototropism) is growth-dependent and slower.

Source: Chapter 6, Section 6.2 / 6.2.1 / 6.2.2

Explanation

Examiners expect exactly **two** clear, contrasting differences. The two key points are:

1. **Growth involvement** — sensitive plant = no growth; phototropism = growth-dependent. This is explicitly stated in the textbook.
2. **Mechanism** — sensitive plant uses change in water content of cells; shoot bending uses auxin-driven differential growth.

Stating only one difference will fetch only 1 mark. A table format is acceptable and often preferred for "difference" questions as it is clear and saves time.

Q33. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[2]

Where are auxins synthesized ? How do they promote phototropism ?

Previously asked in: 2024 31/3/1 Q22

♦ **Control and Coordination** Role of auxins in phototropism Synthesis and site of production of auxins

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Model Answer

Auxins are synthesized at the **shoot tip (apical meristem)**.

When light falls from one side, auxins migrate to the **shaded side** of the shoot. This causes cells on the shaded side to elongate more than those on the lit side, making the shoot **bend towards the light** — this is phototropism.

Explanation

Examiners look for two things: (1) the site of synthesis and (2) the mechanism — unequal distribution of auxin causing differential cell elongation leading to bending. Both points must be mentioned to score full 2 marks. Avoid vague answers like "auxins cause growth"; be specific about *unequal* elongation.

Q34. § 6.2 COORDINATION IN PLANTS

[5]

- (i) Leaves of chhui-mui plant begin to fold up and droop in response to a stimulus. Name the stimulus and write the cause for such a rapid movement. Is there any growth involved in the movement ?
- (ii) Define geotropism in plants. What is meant by positive and negative geotropism ? Give one example of each type.

Previously asked in: 2024 31/4/1 Q35 (b)

♦ Control and Coordination

Geotropism – positive and negative geotropism with examples

Nastic movements – Touch stimulus in Mimosa pudica (chhui-mui)

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Model Answer

(i)

Stimulus: Touch

Cause: The leaves of chhui-mui (Mimosa) move because plant cells change their shape by **changing the amount of water** in them. When touched, information is transmitted from cell to cell by electrical-chemical means, causing cells to lose water and shrink. This results in the leaves folding up and drooping.

Growth involved: No. This movement is **independent of growth**; it is an immediate response to the stimulus.

(ii)

Geotropism is the directional growth movement of plant parts in response to the pull of gravity (earth).

- **Positive geotropism:** Growth in the direction of gravity (downward). *Example:* Roots of a plant grow downwards into the soil.
- **Negative geotropism:** Growth against the direction of gravity (upward). *Example:* Shoots/stems of a plant grow upwards, away from the earth.

Source: Chapter 6, Sections 6.2, 6.2.1, 6.2.2

Explanation

- Part (i) carries ~2–3 marks: name the stimulus (1 mark), explain the cause using water movement in cells (1 mark), and state no growth is involved (1 mark).
- Part (ii) carries ~2 marks: define geotropism, then define positive and negative with one example each. Examiners expect the word "gravity" in the definition.
- Key phrase to remember: plant cells **change shape by changing the amount of water in them** — this explains chhui-mui movement without growth.
- Don't confuse phototropism (light) with geotropism (gravity).

Q35. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[3]

Plants have neither a nervous system nor muscles, even then they respond to stimuli. For example, the leaves of chhui-mui (touch-me-not) plant when touched begin to fold up and droop.

- (a) How is the information communicated in "touch-me-not" plants ? [1]
- (b) What enables the plant cells to bring out the observable response ? [1]
- (c) Differentiate the movement mentioned above from the movement of tendrils in a pea plant. [1]

Previously asked in: 2025 31/1/1 Q29

♦ Control and Coordination

Nastic movement vs. Tropic movement – touch-me-not (seismonastic) vs. tendril movement (thigmotropism)

Plant movements – touch-me-not (Mimosa pudica) response and electrical/ionic signal transmission

Turgor pressure changes in plant cells enabling movement

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Model Answer

(a) In touch-me-not plants, information is communicated from cell to cell through **electrical-chemical means**. However, unlike animals, there is no specialised tissue for conduction of this information.

(b) Plant cells change their **shape by changing the amount of water** in them, resulting in swelling or shrinking. This change in turgor pressure enables the observable movement (folding/drooping of leaves).

(c) The movement of leaves in touch-me-not is **independent of growth** — it occurs due to change in water content in cells. The movement of tendrils in a pea plant is **dependent on growth** — it is a directional growth response (thigmotropism).

Source: Chapter 6, Section 6.2 and 6.2.1

Explanation

- (a) Examiner wants the phrase "electrical-chemical means" and the point that no specialised tissue exists — both earn the mark.
- (b) Key term is **turgor change / change in water content** causing cells to swell or shrink. Don't write "proteins" here — that's for animal muscles.
- (c) The one-mark distinction is simply: sensitive plant movement = **growth-independent**; tendril movement = **growth-dependent**. Use these exact contrasting terms.

Q36. § 6.3 HORMONES IN ANIMALS

[3]

Name the gland and the hormone secreted by it in scary situations in human beings. List any two responses shown by our body when this hormone is secreted into the blood.

Previously asked in: 2023 31/6/1 Q29(a)

♦ **Control and Coordination** Adrenal gland and adrenaline (epinephrine) – fight or flight response

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Model Answer

Gland and Hormone: In scary situations, the **adrenal glands** (located on top of the kidneys) secrete the hormone **adrenaline** into the blood.

Two responses shown by the body:

1. **Heart beats faster** — resulting in more oxygen supply to the muscles.
2. **Breathing rate increases** — due to contractions of the diaphragm and rib muscles, supplying more oxygen to the body.

(Other valid responses: blood is diverted from digestive system/skin to skeletal muscles; contraction of muscles around small arteries in digestive system and skin.)

Source: Chapter 6, Section 6.3 — Hormones in Animals

Explanation

- Examiners expect: **name of gland** (adrenal) + **name of hormone** (adrenaline) — both needed for full credit.
- Two responses must be distinct body changes; don't repeat the same idea in different words.
- Common mistakes: writing "kidney gland" instead of adrenal gland, or giving vague responses like "body becomes active."
- The question is 3 marks: 1 mark for gland + hormone, 1 mark each for two responses.

Q37. § 6.2.1 Immediate Response to Stimulus § 6.3 HORMONES IN ANIMALS

[3]

State two limitations of electrical impulses in multicellular organisms. Why is chemical communication better than electrical impulses as a means of communication between cells in multicellular organisms?

Previously asked in: 2025 31/4/1 Q30

♦ **Control and Coordination** Chemical communication vs electrical impulses in multicellular organisms Limitations of electrical impulses in multicellular organisms

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Model Answer**Limitations of electrical impulses:**

1. Electrical impulses can only reach cells connected by nervous tissue; they cannot instruct all body tissues.
2. The range of cells and tissues that can be reached is limited.

Why chemical communication is better:

Chemical signals (hormones) are released directly into the blood and carried to **all cells** of the body. This allows wide-ranging, coordinated changes across many different tissues simultaneously — something electrical impulses alone cannot achieve. For example, adrenaline prepares the entire body for fight or flight by affecting the heart, muscles, digestive system, and breathing rate at once.

Source: Chapter 6, Section 6.3 — Hormones in Animals

Explanation

- The question has two parts: **limitations (1 mark)** and **why chemical is better (2 marks)** — answer both clearly.
- The key phrase from the textbook is: "If the body design relied only on electrical impulses via nerve cells, the range of tissues instructed would be limited." Use this idea directly.
- For the second part, stress that hormones travel through **blood** and reach **all cells**, enabling **wide-ranging** changes — the examiner looks for these keywords.
- Adrenaline as an example strengthens the answer and shows application.

Q38. § 6.3 HORMONES IN ANIMALS

[3]

Name the hormone released and the gland which secretes it in human beings during scary situations. How does the body respond to enable it to deal with the situation ?

Previously asked in: 2023 31/2/1 Q30

♦ **Control and Coordination** Adrenaline hormone and fight-or-flight response

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Model Answer

Hormone: Adrenaline

Gland: Adrenal glands (located above the kidneys)

Adrenaline is secreted directly into the blood and carried to various target organs. The body responds as follows:

- **Heart:** Beats faster, supplying more oxygen to muscles.
- **Blood vessels:** Blood supply to digestive system and skin is reduced; blood is diverted to skeletal muscles.
- **Breathing:** Rate increases due to contraction of diaphragm and rib muscles.

These responses together prepare the body to either fight or flee from the scary situation.

Source: Chapter 6, Section 6.3 — Hormones in Animals

Explanation

- The question has **three parts** embedded: (1) name the hormone, (2) name the gland, (3) describe the body's response — award ~1 mark each.
- Examiners expect all three responses (heart rate, blood diversion, breathing) to be mentioned; missing even one may cost a mark.
- "Adrenal glands" must be named specifically — writing only "endocrine gland" is insufficient.
- The phrase "**fight or flight**" context is useful to set up the answer but is not mandatory.

Q39. § 6.1.2 Human Brain § 6.1.3 How are these Tissues protected?

[1]

Walking in a straight line and riding a bicycle are the activities which are possible due to a part of the brain. Choose the correct location and name of this part from the given table :

- Fore brain | Cerebrum
- Mid brain | Hypothalamus
- Hind brain | Cerebellum
- Hind brain | Medulla

Previously asked in: 2023 31/6/1 Q6

♦ **Control and Coordination** Cerebellum – location and function in coordinating voluntary movements

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Model Answer

(c) Hind brain | Cerebellum

Explanation

The textbook explicitly states: "*activities like walking in a straight line, riding a bicycle... are possible due to a part of the hind-brain called the cerebellum.*" Cerebellum controls precision of voluntary actions and maintains posture and balance — not the medulla (which controls involuntary actions like blood pressure) or cerebrum (main thinking part).

Source: Chapter 6, Section 6.1.2 – Human Brain

Q40. § 6.1.4 How does the Nervous Tissue cause Action?

[2]

Answer the following:

- Write the role of insulin in regulating blood sugar levels in human body. Mention the disease caused due to it.
- How is the timing and the amount of release of insulin in the blood regulated ?

Previously asked in: 2023 31/1/1 Q22

♦ **Control and Coordination** Feedback Mechanism in Hormonal Regulation Role of Insulin in Blood Sugar Regulation and Diabetes

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Model Answer

(a) Insulin is secreted by the pancreas and helps in lowering blood glucose levels by facilitating the uptake of glucose by body cells. Deficiency or improper functioning of insulin causes **diabetes mellitus (sugar diabetes)**.

(b) The timing and amount of insulin released is regulated by **feedback control** — when blood sugar level rises, more insulin is secreted; when it falls back to normal, secretion reduces automatically.

Explanation

- This question is from Chapter 7 (Control and Coordination) — Biology. The source passages provided are unrelated, but the answer is based on standard NCERT Class 10 Science content.
- Key terms to include: *pancreas*, *lowers blood glucose*, *diabetes mellitus*, and *feedback mechanism*.
- Examiners expect the disease name clearly mentioned in part (a) and the term "feedback" or "feedback control" in part (b).

Q41. § 6.1.2 Human Brain § 6.1.3 How are these Tissues protected? § 6.2 COORDINATION IN PLANTS

[5]

Answer the following :

- (i) Distinguish between hormonal co-ordination in plants and animals.
- (ii) Which part of the brain is responsible for – (1) intelligence (2) riding a bicycle (3) vomiting (4) controlling hunger
- (iii) How is brain and spinal-cord protected against mechanical injuries ?

Previously asked in: 2024 31/2/1 Q35(a)

♦ Control and Coordination Hormonal coordination in plants vs animals Parts of the Brain and their Functions Protection of brain and spinal cord

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Model Answer**(i) Hormonal co-ordination: Plants vs. Animals**

| Plants | Animals |

|---|---|

| Hormones are called phytohormones (e.g., auxin, gibberellin) | Hormones are secreted by endocrine glands (e.g., insulin, adrenaline) |

|

| No specific glands; produced in various tissues | Produced by specific ductless glands |

| Response is slow | Response is comparatively faster |

(ii) Parts of brain responsible for:

1. **Intelligence** – Cerebrum (forebrain)
2. **Riding a bicycle** – Cerebellum (hindbrain)
3. **Vomiting** – Medulla oblongata (hindbrain)
4. **Controlling hunger** – Hypothalamus (forebrain)

(iii) Protection of brain and spinal cord:

- The **brain** is enclosed in a bony box called the **cranium** (skull).
- The **spinal cord** is enclosed in a **vertebral column** (backbone).
- Both brain and spinal cord are covered by three membranes called **meninges**.
- A fluid-filled space between the meninges acts as a **shock absorber**, protecting these organs from mechanical injury.

Explanation

- Sub-question (i) carries ~1–2 marks: a short comparison table or 2–3 contrasting points is sufficient.
- Sub-question (ii) carries ~2 marks: one line per part; examiners expect exact brain region names.
- Sub-question (iii) carries ~1–2 marks: mention cranium, vertebral column, meninges, and cerebrospinal fluid — all four points are expected.
- These answers come from Chapter 7 (Control and Coordination), NCERT Class 10 Science. The source passages provided were from other chapters and were not relevant, so standard NCERT content was used.

Q42.

[1]

Select out of the following a gland which does NOT occur as a pair in the human body :

- (A) Pituitary
(B) Ovary
(C) Testis
(D) Adrenal

Previously asked in: 2024 31/2/1 Q9

♦ Control and Coordination Endocrine Glands – Paired vs Unpaired Glands in Human Body

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Model Answer**(A) Pituitary**

The pituitary gland is a single (unpaired) gland located at the base of the brain, whereas ovaries, testes, and adrenal glands occur as pairs in the human body.

Explanation

The question tests knowledge of paired vs. unpaired glands. Ovaries (female), testes (male), and adrenal glands all occur as pairs. The pituitary is a single master endocrine gland — examiners expect you to identify it as the odd one out. Remember: "pair" means two of the same gland exist in the body.

Q43. § 6.1.3 How are these Tissues protected? § 6.3 HORMONES IN ANIMALS

[1]

A pair of endocrine glands located in the human brain is

- (A) Parathyroid and Pituitary
- (B) Pineal and Thymus
- (C) Hypothalamus and Thymus
- (D) Hypothalamus and Pineal

Previously asked in: 2025 31/6/1 Q9

♦ Control and Coordination Endocrine Glands in the Brain (Hypothalamus and Pituitary)

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Model Answer**(D) Hypothalamus and Pineal**

Both the hypothalamus and the pineal gland are endocrine glands located within the human brain.

Source: Chapter 6, Section 6.3 – Hormones in Animals

Explanation

- **Pituitary** is attached to the base of the brain (not inside brain tissue itself); **parathyroid** and **thymus** are located in the neck/chest — all outside the brain.
- **Hypothalamus** is a brain region that releases regulatory hormones; **pineal gland** is embedded in the brain and secretes melatonin.
- The textbook's Fig. 6.7 and the "Do You Know?" box on hypothalamus confirm both are brain-located endocrine glands, making **(D)** the correct choice.

Q44. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[5]

Answer the following:

- (i) List three points of difference between nervous and hormonal mechanisms for control and coordination in animals.
- (ii) How are auxins related with the bending of plant shoot towards unidirectional light ? Explain.

Previously asked in: 2023 31/2/1 Q35 (a)

♦ Control and Coordination Differences between nervous and hormonal mechanisms of control and coordination

Role of auxins in phototropism / bending of plant shoot towards unidirectional light

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Model Answer**(i) Differences between Nervous and Hormonal Mechanisms:**

| Nervous Mechanism | Hormonal Mechanism |

|---|---|

| Information transmitted as electrical impulses | Information transmitted as chemical hormones through blood |

| Response is very fast | Response is slow |

| Effect is short-lived | Effect is long-lasting |

(ii) Auxins and Phototropism:Auxins are plant hormones produced at the shoot tip. When light falls from one side (unidirectional), auxins migrate to the **shaded (darker) side** of the shoot.The higher concentration of auxins on the shaded side causes cells there to **elongate faster** than cells on the illuminated side. This unequal growth causes the shoot to **bend towards the light source**.This bending movement is called **phototropism**, and it is a positive phototropic response — the shoot grows in the direction of light.

Source: Chapter 7 — Control and Coordination

Explanation

- For part (i), examiners expect **three clear points** as a table or parallel list. Common accepted points: speed of response, duration of effect, medium of communication (electrical vs. chemical), localised vs. widespread effect.
- For part (ii), the key steps are: auxin production at tip → migration to shaded side → differential cell elongation → bending toward light. Missing "differential elongation" loses a mark. Name the response as phototropism for full credit.
- The source passages provided are unrelated (Chemistry/Physics chapters), so this answer is based on the standard NCERT Chapter 7 Biology content, which is the prescribed source for this topic.

Q45. § 6.1.4 How does the Nervous Tissue cause Action? § 6.3 HORMONES IN ANIMALS

[3]

Taking the example of any two animal hormones along with their gland of secretion, explain how these hormones help (i) in growth and development and (ii) regulate metabolism, in the body.

Previously asked in: 2024 31/5/1 Q29

♦ **Control and Coordination** Animal hormones – glands of secretion and their functions Role of hormones in growth and development
Role of hormones in regulation of metabolism

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Model Answer

Two animal hormones:

1. **Thyroxin** (secreted by the thyroid gland) — regulates the rate of metabolism (carbohydrates, fats, and proteins). It also controls body growth and development. Deficiency causes goitre.
1. **Testosterone** (secreted by the testes) — regulates the formation of sperms and brings about changes in appearance (voice, facial hair, muscle growth) during puberty, thus controlling growth and development.

Both hormones are regulated by a **feedback mechanism** to maintain balance in the body.

Source: Chapter 6 (Control and Coordination); Chapter 7 (Reproduction)

Explanation

- The question asks for **two hormones**, their **glands**, and their role in **(i) growth and development** and **(ii) metabolism** — address all parts.
- Thyroxin is the classic example for metabolism; testosterone is directly mentioned in the source passage for growth/development at puberty.
- Mentioning the feedback mechanism earns an extra point and shows conceptual understanding.
- Avoid writing lengthy paragraphs — examiners reward concise, point-wise answers for 3-mark questions.

Q46. § 6.3 HORMONES IN ANIMALS

[4]

A person while climbing up a rocky hill comes into a panic state and fear. His body starts reacting in a "flight-or-flight" condition to adjust to the dangerous and stressful situation.

Read the following case and answer the questions that follow.

- (a) (i) Name the hormone secreted in the blood of the person in this situation. [1]
- (b) State any two responses in the body of the person as a result of the secretion of this hormone. [2]
- (c) How does the action of the chemical signal in terms of hormones differ from the electrical impulses via nerve cells? [1]

Previously asked in: 2025 31/3/1 Q38

♦ **Control and Coordination** Adrenaline hormone and fight-or-flight response Hormonal vs. nervous system coordination – chemical signals vs. electrical impulses

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Model Answer

(a)(i) The hormone secreted in this situation is **Adrenaline** (also called epinephrine), secreted by the adrenal glands.

(b) Two responses in the body due to adrenaline secretion:

1. Heart rate increases, supplying more oxygen to the muscles.
2. Breathing rate increases and blood is diverted away from digestive organs to skeletal muscles, preparing the body for quick action.

(c) Electrical impulses via nerve cells act **faster but only on specific cells** connected by the nerve. Hormones (chemical signals) act **more slowly** but have a **widespread effect** as they are transported through the bloodstream and can target many tissues/organs at once.

Source: Life Processes / Control and Coordination, Chapter 7, NCERT Class 10 Science

Explanation

- Adrenaline is the classic answer for "fight-or-flight" — examiners specifically look for this term.
- For part (b), any two valid physiological responses score full marks: heart rate ↑, breathing rate ↑, dilation of pupils, reduced digestion activity — pick two clearly.
- For part (c), the key contrast is **speed vs. reach**: nerves = fast + localised; hormones = slower + widespread. One clear sentence covering both sides is enough for 1 mark.

Q47. § 6.2.1 Immediate Response to Stimulus § 6.3 HORMONES IN ANIMALS [2]

Answer the following: "Hormones should be secreted in precise quantities. We have a feedback mechanism through which this is done." With the help of an example justify the statement.

Previously asked in: 2025 31/2/1 Q29 (b)

♦ Control and Coordination Feedback Mechanism in Hormone Secretion

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Model Answer

Hormones must be secreted in precise amounts for the body to function properly. This is controlled by **feedback mechanisms**.

Example: When blood sugar rises, the pancreas detects this and secretes more **insulin**, which lowers blood sugar. As the blood sugar level falls, insulin secretion is reduced. Thus, the hormone level is self-regulated.

Source: Chapter 6, Section 6.3 – Hormones in Animals

Explanation

- The examiner expects you to state that feedback mechanism controls hormone secretion, and then support it with the insulin-blood sugar example from the textbook.
- Mention both parts of the feedback loop: **rise in sugar → more insulin secreted** AND **fall in sugar → insulin secretion reduced**. Missing either part loses marks.
- Adrenaline/thyroxin can also work as examples, but insulin is the clearest one explicitly described in the chapter.

Q48. § 6.3 HORMONES IN ANIMALS [1]

Answer the following: Define hormone.

Previously asked in: 2025 31/2/1 Q29 (a)

♦ Control and Coordination Definition of Hormone

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Model Answer

A hormone is a chemical substance produced in one part of an organism that moves to another part to bring about a specific effect, regulated by a feedback mechanism.

Source: What you have learnt, Chapter 6

Explanation

The examiner expects a concise definition covering two key points: (1) hormones are chemicals produced in one part and (2) they act on another part. Mentioning the feedback mechanism adds completeness. Avoid long explanations for a 1-mark question.

Q49. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.2 Human Brain § 6.1.3 How are these Tissues protected? [2]

Name the parts of hind-brain of the human brain. Which part of the hind-brain controls involuntary actions such as blood pressure and salivation ?

Previously asked in: 2025 31/2/1 Q23

♦ Control and Coordination Medulla Oblongata – Control of Involuntary Actions Parts of the Hind-brain (Cerebellum, Pons, Medulla Oblongata)

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Model Answer

Parts of the hind-brain: Medulla, Cerebellum, and Pons.

Control of involuntary actions: The **medulla** in the hind-brain controls involuntary actions such as blood pressure, salivation, and vomiting.

Source: Chapter 6, Section 6.1.2 – Human Brain

Explanation

- Examiners expect **all three parts** of the hind-brain named for full credit (1 mark), and the specific part — **medulla** — identified for the second mark.
- The textbook explicitly states: "All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain." Use this exact terminology.
- Do not confuse cerebellum (precision of voluntary actions / balance) with medulla (involuntary actions).

Q50. § 6.1.2 Human Brain

[1]

Walking in a straight line and riding a bicycle are activities which are possible due to coordination of which part of the brain ?

- (A) Fore-Brain — Cerebrum
- (B) Mid-Brain — Cerebellum
- (C) Hind-Brain — Cerebellum
- (D) Hind-Brain — Medulla

Previously asked in: 2026 31/3/1 Q3

♦ Control and Coordination Cerebellum – coordination of voluntary muscle activities

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Model Answer

(C) Hind-Brain — Cerebellum

Walking in a straight line and riding a bicycle are possible due to the **cerebellum**, located in the **hind-brain**, which controls precision of voluntary actions and maintains posture and balance.

Explanation

The passage explicitly states: "activities like walking in a straight line, riding a bicycle... are possible due to a part of the hind-brain called the cerebellum." Students often confuse cerebellum with cerebrum (fore-brain) or mid-brain — note that cerebellum is in the **hind-brain**, not the mid-brain. Option (B) is a common wrong answer because of this mix-up.

Source: Chapter 6, Section 6.1.2 Human Brain

Q51. § 6.1.1 What happens in Reflex Actions? § 6.1.2 Human Brain

[4]

A middle-aged person is facing some cognitive changes in himself. His early symptoms included mild forgetfulness. For example, forgetting where he left his mobile or failing to find words to complete his sentences. He was facing problems in driving a car, climbing up and down the stairs, inserting a plug into an outlet. He slowly developed a sad mood and anxiety.

Read the following passage and answer the questions that follow :

- (a) What are voluntary actions ? [1]
- (b) Which part of the brain is responsible for precision of voluntary actions ? [1]
- (c) Answer (i) or (ii): [2]

Previously asked in: 2026 31/2/1 Q15

♦ Control and Coordination Brain structure and functions (forebrain, midbrain, hindbrain) Role of the cerebellum in precision of voluntary actions
Voluntary actions and their control

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Model Answer

(a) **Voluntary actions** are actions that are consciously controlled by the individual, such as walking, writing, or picking up an object. These actions are under the control of the cerebrum.

(b) The **cerebellum** is responsible for the precision and coordination of voluntary actions. It ensures smooth, balanced, and accurate movements.

(c) (i) The person is showing symptoms related to the **forebrain (cerebrum)**. The cerebrum controls memory, thinking, and reasoning, explaining forgetfulness and word-finding difficulty. The **medulla oblongata** (hindbrain) regulates involuntary actions. The problems with driving, climbing stairs, and inserting a plug suggest impaired **cerebellum** function, which controls precision of voluntary movements. Sad mood and anxiety indicate disruption in the cerebrum's emotional regulation areas.

Source: Control and Coordination, Nervous System – Human Brain

Explanation

- (a) Just define voluntary actions in one line — mention conscious control.
- (b) Cerebellum is the key term; examiners want this specific part named.
- (c) Link each symptom to the correct brain part: memory/emotion → cerebrum; precision of movement → cerebellum. Use textbook terminology. If option (ii) was chosen instead, answer that; here option (i) is attempted as a model. Always connect the case study details to your answer — examiners reward application.

Q52. § 6.3 HORMONES IN ANIMALS

[2]

"The timing and the amount of hormone secreted by a gland are regulated in the human body." Justify this statement with the help of an example.

Previously asked in: 2026 31/2/1 Q10 (a)

♦ Control and Coordination Feedback Mechanism in Hormone Regulation

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Model Answer

The timing and amount of hormone secreted are regulated by **feedback mechanisms**.

Example: When blood sugar levels rise, the pancreas detects this and secretes more **insulin**, which lowers the sugar level. As blood sugar falls, insulin secretion is reduced. Thus, the body automatically regulates hormonal output based on need.

Source: Chapter 6, Section 6.3 – Hormones in Animals

Explanation

- The key term examiners expect is "**feedback mechanism**" — write it explicitly.
- Use the **insulin–blood sugar** example as it is directly given in the textbook.
- Show both directions: hormone increases → level corrects → hormone decreases. This demonstrates the *regulation* the question asks about.
- Avoid writing about adrenaline here; insulin is the cleaner example for this specific question.

Q53. § 6.3 HORMONES IN ANIMALS

[1]

Identify the endocrine gland that regulates the growth of human body.

- (A) Pituitary gland
- (B) Thyroid gland
- (C) Pancreas
- (D) Adrenal gland

Previously asked in: 2026 31/5/1 Q2

♦ Control and Coordination Endocrine Glands and Hormones – Pituitary Gland and Growth Hormone

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Model Answer

(A) Pituitary gland

The pituitary gland is the endocrine gland that regulates the growth of the human body by secreting growth hormone.

Explanation

The pituitary gland (master gland) secretes growth hormone (GH), which directly controls body growth. The thyroid regulates metabolism, pancreas regulates blood sugar, and adrenal gland manages stress responses. Examiners expect you to recall this standard fact from the endocrine system topic in Chapter 7/Chapter 6.

Q54. § 6.3 HORMONES IN ANIMALS

[1]

Give reasons for the following : Adrenal gland is known as the stress gland of the body.

Previously asked in: 2026 31/4/1 Q13 (a)

♦ Control and Coordination Endocrine System and Hormones (Adrenaline/Adrenal Gland)

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Model Answer

The adrenal gland secretes **adrenaline** during fearful or stressful situations (fight-or-flight response), preparing the body by increasing heart rate, breathing rate, and diverting blood to muscles.

Source: Chapter 6, Section 6.3 – Hormones in Animals

Explanation

The examiner expects you to link the adrenal gland specifically to **adrenaline** and its role in **emergency/stress situations**. Mention at least one physiological effect (faster heartbeat, increased breathing) to complete the answer. The term "fight-or-flight" is a bonus but not compulsory for 1 mark.

Q55. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[1]

Select from the following a plant hormone which promotes cell division.

- A Gibberellins
- B Auxins
- C Abscissic Acid
- D Cytokinins

Previously asked in: 2024 31/3/1 Q8

♦ Control and Coordination Plant Hormones – Cytokinin (promotes cell division)

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Model Answer**Option D — Cytokinins**

Cytokinins promote cell division in plants. (It is also a plant hormone, as confirmed in the NCERT exercise.)

Source: Exercises, Chapter 6

Explanation

- The question tests knowledge of plant hormone functions.
- Cytokinins** → promote **cell division**.
- Auxins → promote cell elongation/phototropism; Gibberellins → promote stem elongation/seed germination; Abscissic acid → inhibits growth/promotes wilting.
- The NCERT exercise (Chapter 6, Q.1) directly identifies **Cytokinin** as a plant hormone, and the chapter text links it to cell division.

Q56. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[5]

Answer the following :

- What are tropic movements ? Give an example of a plant hormone which (1) inhibits growth and (2) promotes cell division.
- Explain directional movement of a tendril in pea plant in response to touch. Name the hormone responsible for this movement.

Previously asked in: 2024 31/2/1 Q35(b)

♦ Control and Coordination Plant Hormones – Abscissic Acid (growth inhibitor) and Cytokinin (promotes cell division)

Thigmotropism – Tendril movement in pea plant Tropic Movements in Plants

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Model Answer**(i) Tropic Movements:**

Tropic movements are directional movements of a plant part in response to an external stimulus, where the direction of movement is determined by the direction of the stimulus.

- Hormone that **inhibits growth: Abscissic acid (ABA)**
- Hormone that **promotes cell division: Cytokinin**

(ii) Movement of Tendril in Pea Plant:

When a tendril touches a support, the cells on the side of the tendril away from the support grow faster (more auxin accumulates there), while the cells on the touching side grow slower. This unequal growth causes the tendril to curl around the support, enabling the plant to climb.

This movement is an example of **thigmotropism** (touch tropism). The hormone responsible is **Auxin**, which causes differential growth by promoting cell elongation on the side away from the stimulus.

Explanation

- Tropic movements are always *directional* — caused by unilateral (one-sided) stimuli. Don't confuse with nastic movements (non-directional).
- For the hormone part: ABA (abscissic acid) inhibits growth; cytokinin promotes cell division. Some students wrongly write gibberellin — that promotes stem elongation, not primarily cell division.
- For the tendril answer, examiners want: differential growth → auxin redistribution → curling. The word **thigmotropism** must appear.
- Always name the hormone explicitly; vague answers lose marks.

Q57. § 6.3 HORMONES IN ANIMALS

[2]

There is a hormone which regulates carbohydrate, protein and fat metabolism in our body. Name the hormone and the gland which secretes it. Why is it important for us to have iodised salt in our diet?

Previously asked in: 2024 31/1/1 Q23(B)

♦ Control and Coordination

Importance of iodised salt and iodine deficiency (goitre)

Thyroxine hormone and thyroid gland

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Model Answer**Hormone:** Thyroxine**Gland:** Thyroid gland

Thyroxine regulates carbohydrate, protein, and fat metabolism. Iodine is essential for the thyroid gland to produce thyroxine. Deficiency of iodine leads to less thyroxine production, causing goitre (swollen neck). Hence, iodised salt ensures adequate iodine intake.

Explanation

- Examiners expect two distinct parts: naming the hormone + gland (1 mark), and explaining the need for iodised salt (1 mark).
- Key point: Iodine → thyroxine synthesis → prevents goitre. Mentioning goitre strengthens the answer.
- The source passages do not directly state this, but it is standard NCERT Chapter 7 (Control and Coordination) content that the question is based on.

Q58. § 6.2 COORDINATION IN PLANTS § 6.2.2 Movement Due to Growth

[4]

The growth movements of plant parts in which the direction of the stimulus determines the direction of the response is known as tropic movements or tropism. Plants also have non-directional movements which may not be growth dependent.

Read the source and study the figure, then answer the sub-parts that follow.

- (I) Name the movement which causes 'X' and 'Y' to grow downwards and upwards respectively. (Refer above figure) [1]
- (II) Write the name of a hormone that plays a major role in (i) falling of leaves (ii) rapid cell division [1]
- (III) Answer either (a) or (b). [2]

Previously asked in: 2025 31/6/1 Q38

♦ Control and Coordination

Non-directional (Nastic) movements in plants

Plant hormones – Auxin, Cytokinin, Absciscic acid

Tropic movements (Geotropism) in plants

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Model Answer

(I) The movement is **Geotropism** (Gravitropism). Roots (X) show **positive geotropism** (grow towards gravity) and shoots (Y) show **negative geotropism** (grow against gravity).

(II)(i) Falling of leaves — **Abscisic acid (ABA)**(ii) Rapid cell division — **Cytokinin**

(III) (Since sub-part (a)/(b) options are not provided in the question, a general 2-mark response based on the passage is given below.)

Tropic movements are directional growth movements where the direction of the stimulus determines the direction of the plant's response. For example, phototropism (response to light) and geotropism (response to gravity) are tropic movements. Non-directional movements, such as nastic movements, are independent of the direction of the stimulus and may not be growth-dependent.

Source: Life Processes / Control and Coordination, NCERT Class 10 Science, Chapter 7

Explanation

- **Part (I):** The key term is *geotropism*. Roots grow *towards* gravity (positive), shoots grow *away* (negative). Many students confuse positive/negative — remember: positive = towards the stimulus.
- **Part (II):** ABA (Absciscic Acid) is the "stress hormone" responsible for leaf fall (abscission) and stomatal closure. Cytokinin promotes cell division. These are standard factual points examiners expect.
- **Part (III):** Since the (a)/(b) options were missing, the answer addresses tropism vs. non-directional movement directly from the passage. In the actual exam, read the option carefully and answer only the chosen one with two clear points.

Q59. § Introduction § 6.2.1 Immediate Response to Stimulus § 6.3 HORMONES IN ANIMALS

[5]

Answer the following about chemical control in organisms.

- (a) Analyse the given situations and interpret the possible reason for each : (i) Iodine deficiency in diet increases the possibility of a disease of swollen neck in a person. (ii) Some people in population may have very short heights (dwarfs). (iii) Thick facial hairs develop in boys at the age of 10-12 years.
- (b) Explain two reasons which necessitate the need of chemical communication in multicellular organisms.

Previously asked in: 2025 31/5/1 Q35 (A)

♦ Control and Coordination Growth hormone deficiency and dwarfism (pituitary gland) Iodine deficiency and goitre (thyroid gland)
Need for chemical communication (hormones) in multicellular organisms Testosterone and secondary sexual characteristics in males

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Model Answer

(a)

(i) The thyroid gland requires iodine to produce thyroxin hormone. Iodine deficiency reduces thyroxin production, causing the thyroid gland to enlarge abnormally — a condition called **goitre** (swollen neck).

(ii) The pituitary gland secretes **growth hormone**. If it secretes insufficient growth hormone during childhood, the person's growth is stunted, resulting in **dwarfism** (very short height).

(iii) At puberty (10–12 years), the testes begin secreting **testosterone** (male sex hormone). This hormone triggers the development of secondary sexual characters, including growth of thick facial hair in boys.

(b)

1. **Not all cells are connected by nerves** — chemical hormones can reach every cell through the bloodstream, coordinating parts where nerve impulses cannot act directly.
1. **Long-term/slow responses are needed** — some body functions like growth, reproduction, and metabolism require sustained regulation, which hormones provide more effectively than quick electrical impulses.

Source: Control and Coordination, Chapter 6

Explanation

- For (a), name the specific gland, hormone, and condition in each case — examiners award marks for all three elements.
- For (b), two distinct reasons are required; focus on "why nerves alone are insufficient" (reach) and "type of response needed" (duration). Avoid vague answers like "hormones are important."
- Keyword terms: goitre, dwarfism, testosterone, thyroxin, growth hormone — use these for full marks.

Q60. § 6.2 COORDINATION IN PLANTS § 6.2.2 Movement Due to Growth

[1]

The plant hormones promoting rapid cell division in seeds and wilting of leaves respectively are

- A Auxins and Absciscic acid
B Cytokinins and Absciscic acid
C Gibberellins and Auxins
D Absciscic acid and Gibberellins

Previously asked in: 2025 31/5/1 Q11

♦ Control and Coordination Plant Hormones and Their Functions

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Model Answer**Answer: B — Cytokinins and Absciscic acid**

Cytokinins promote cell division and are found in high concentration in seeds and fruits. Absciscic acid inhibits growth and causes wilting of leaves.

Explanation

The textbook (Chapter 6, Section 6.2.2) directly states: "*Cytokinins promote cell division... present in greater concentration in areas of rapid cell division, such as in fruits and seeds*" and "*Absciscic acid... inhibits growth. Its effects include wilting of leaves.*" Auxins and gibberellins promote stem/cell elongation, not rapid cell division. Do not confuse cytokinins with auxins.

Q61. § 6.1 ANIMALS – NERVOUS SYSTEM § 6.1.2 Human Brain § 6.1.4 How does the Nervous Tissue cause Action?

[2]

Write the name and function of parts (i) and (ii) in the diagram of a neuron given below.

Previously asked in: 2023 31/5/1 Q22

♦ **Control and Coordination** Functions of neuron components (dendrites, axon, cell body, etc.) Structure and parts of a neuron

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Model Answer

(i) Dendrite

Function: It receives information/nerve impulses from the environment or other neurons and transmits them toward the cell body.

(ii) Axon terminal (nerve ending)

Function: At the end of the axon, the electrical impulse triggers release of chemicals that cross the synapse and pass the impulse to the next neuron or effector (muscle/gland).

Source: Chapter 6, Section 6.1 – Animals: Nervous System

Explanation

- The examiner expects the **correct name** and a clear **one-line function** for each part — that's 1 mark per part.
- Key terms to use: *receives impulse / chemical reaction / electrical impulse / synapse / axon terminal*.
- Avoid confusing dendrite (receiving end) with axon (conducting end). The dendrite picks up signals; the axon terminal releases chemicals across the synapse to pass the signal onward.

Q62. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[2]

(B) Where are auxins synthesized in a plant ? Which organ of the plant shows :

- Positive phototropism
- Negative geotropism
- Positive hydrotropism

Previously asked in: 2023 31/4/1 Q22 (B)

♦ **Control and Coordination** Auxins – site of synthesis and functions Tropic movements – phototropism, geotropism, and hydrotropism

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Model Answer

Auxins are synthesized at the shoot tips (apical meristems) of plants.

- Positive phototropism** — Shoot (stem); it bends towards light.
- Negative geotropism** — Shoot (stem); it grows away from the force of gravity.
- Positive hydrotropism** — Root; it grows towards water/moisture.

Explanation

- The question has two parts: synthesis site of auxins + three tropic responses. Address all parts.
- Remember: shoots show positive phototropism AND negative geotropism; roots show positive geotropism AND positive hydrotropism. This contrast is a common exam trap.
- "Positive" means growth towards the stimulus; "negative" means growth away from the stimulus.
- Auxins cause unequal cell elongation on the shaded/unstimulated side, bending the organ toward or away from the stimulus.

Q63. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[1]

In plants the role of cytokinin is :

- Promote cell division.
- Wilting of leaves.
- Promote the opening of stomatal pore.
- Help in the growth of stem.

Previously asked in: 2023 31/4/1 Q11

♦ **Control and Coordination** Plant Hormones – Cytokinin

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Model Answer

(a) Promote cell division.

Cytokinin is a plant hormone that promotes cell division (cytokinesis) in plants.

Explanation

The question tests knowledge of plant hormones from Chapter 6. Cytokinin specifically promotes cell division and is used in tissue culture to stimulate rapid cell division (callus formation). The other options describe functions of Absciscic acid (wilting/stomatal closure) and Auxin/Gibberellin (stem growth). Examiners expect direct identification of the correct option with a brief supporting reason.

Q64.

[5]

Answer the following:

- (i) Name the disorder which a person is likely to suffer from due to the following : (I) Over-secretion of growth hormone, (II) Deficiency of oestrogen in females, (III) Less secretion of thyroxine. Also name the gland that secretes each of the hormones mentioned above.
- (ii) How is the timing and amount of hormone released regulated ? Explain with the help of an example.

Previously asked in: 2023 31/2/1 Q35 (b)

♦ **Control and Coordination** Feedback mechanism regulating hormone secretion
Hormonal disorders due to over/under secretion (Growth hormone, Oestrogen, Thyroxine)

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Model Answer**(i)**

| Hormone | Disorder | Gland |

|---|---|---|

| (I) Over-secretion of Growth Hormone | Gigantism (in children) / Acromegaly (in adults) | Pituitary gland |

| (II) Deficiency of Oestrogen | Osteoporosis / irregular menstrual cycle | Ovary |

| (III) Less secretion of Thyroxine | Goitre / Hypothyroidism | Thyroid gland |

(ii) Regulation of Hormone Release — Feedback Mechanism:The timing and amount of hormone released is regulated by a **feedback mechanism**.

Example: When blood sugar rises, the pancreas secretes more **insulin**, which lowers blood glucose. When blood sugar returns to normal, further secretion of insulin is stopped. This self-regulating loop — where the effect of the hormone feeds back to control its own secretion — is called **negative feedback**.

Similarly, if thyroid hormone levels fall, the pituitary releases TSH to stimulate the thyroid; once levels are normal, TSH secretion decreases.

Explanation

- Part (i) is straightforward recall — examiners expect **all three** disorders AND **all three** glands named correctly. Missing either costs marks.
- Part (ii) must name the mechanism (**feedback/negative feedback**) and give a **clear example** showing stimulus → hormone release → effect → regulation. The insulin/blood sugar example is the most commonly expected one in CBSE. Two marks typically go to the concept and one to the example.
- Do not write long paragraphs — a table for (i) and 4–5 lines for (ii) is sufficient.

Q65.

§ 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[1]

The plant hormone present in greater concentration in the areas of rapidly dividing cells is :

- (A) Auxin
(B) Cytokinins
(C) Gibberellins
(D) Absciscic acid

Previously asked in: 2025 31/3/1 Q8

♦ **Control and Coordination** Plant Hormones – Cytokinins and Cell Division

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Model Answer**(B) Cytokinins**

Cytokinins are plant hormones found in greater concentration in areas of rapidly dividing cells, as they promote cell division (cytokinesis).

Explanation

Cytokinins are specifically associated with promoting cell division and are naturally found in high concentrations in regions of active cell division such as root tips, germinating seeds, and fruits. This distinguishes them from auxins (cell elongation), gibberellins (stem elongation/seed germination), and abscisic acid (growth inhibition/stomatal closure). CBSE expects students to recall the specific function of each plant hormone.

Q66. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus § 6.2.2 Movement Due to Growth

[2]

Which of the plant hormones are responsible for the following processes ?

- (i) Promote cell division
- (ii) Inhibition of growth
- (iii) Detection of light
- (iv) Wilting of leaves

Previously asked in: 2026 31/5/1 Q11 ((B))

♦ Control and Coordination Plant Hormones and Their Functions

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Model Answer

- (i) **Cytokinins** promote cell division (found in higher concentration in fruits and seeds).
- (ii) **Abscisic acid** inhibits growth.
- (iii) **Auxin** — synthesised at the shoot tip, it detects light and causes the plant to bend towards light.
- (iv) **Abscisic acid** causes wilting of leaves.

Source: Chapter 6, Section 6.2.2

Explanation

All four answers come from one paragraph in Section 6.2.2. Examiners expect the correct hormone name for each process — misspelling "abscisic" or "cytokinin" can cost marks. Note that abscisic acid appears in **both** (ii) and (iv) — wilting of leaves is given as a specific effect of the same hormone that inhibits growth, so both sub-parts share the same answer.

Q67. § 6.2 COORDINATION IN PLANTS § 6.2.1 Immediate Response to Stimulus

[4]

Plants exhibit movements in response to various environmental stimuli to adopt and survive in their surroundings. These movements, influenced by external factors such as light, gravity, water and chemicals are regulated by specific plant hormones. For example, the differential growth of plant parts allows them to bend, grow or orient themselves in particular directions. Roots and shoots often show contrasting response to the same stimulus, highlighting the complex mechanisms involved in plant growth and development.

Plants exhibit movements in response to various environmental stimuli to adopt and survive in their surroundings. These movements, influenced by external factors such as light, gravity, water and chemicals are regulated by specific plant hormones. For example, the differential growth of plant parts allows them to bend, grow or orient themselves in particular directions. Roots and shoots often show contrasting response to the same stimulus, highlighting the complex mechanisms involved in plant growth and development.

- (a) Why is hydrotropism essential for plants ?
- (b) What role does auxin play in the growth of plants ?
- (c) Differentiate between movement shown by the sensitive plant and tropic movement by plants (Two points).

Previously asked in: 2026 31/4/1 Q15

♦ Control and Coordination Plant Hormones (Auxin and others) Tropic Movements in Plants (Phototropism, Geotropism, Hydrotropism, Chemotropism)

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Model Answer

- (a) Hydrotropism is essential for plants because roots grow towards water sources, ensuring adequate water absorption for survival, photosynthesis, and other metabolic activities.
- (b) Auxin is produced at the shoot tip and promotes cell elongation. It causes differential growth — cells on the shaded side elongate more, making the shoot bend towards light. In roots, even low auxin concentration inhibits growth, causing contrasting responses.
- (c)

| Sensitive Plant (*Mimosa*) | Tropic Movement |

|---|---|

| Movement is not growth-based; it is due to loss of water from cells. | Movement is due to differential growth. |

| It is a non-directional (nastic) movement. | It is directional, in response to a specific stimulus (light, gravity, etc.). |

Source: Control and Coordination, Plant Movements and Hormones

Explanation

- (a) is 1 mark — one crisp reason suffices.
- (b) is 1 mark — focus on auxin's role in cell elongation and bending; mention both shoot and root for completeness.
- (c) is 2 marks — examiners expect exactly **two clear, contrasting points**; a table format is neat and gains full marks. Key distinction: nastic (non-directional, non-growth) vs. tropic (directional, growth-based).

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