CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: ALK1C6 **Questions: 46** **Maximum Marks: 130** **Generated: 2026-06-25 17:31**

SELECTIONS USED

Subject	Science
Lessons	6 Control and Coordination
Level of understanding	Thorough understanding
Question selection	Curated chapter coverage (~5 questions per section + 8 synthesis)
Model	claude-sonnet-4-6

Composition — Difficulty: 3 straightforward · 23 medium · 20 deep | Types: 34 Short · 6 Long · 3 Very short · 3 MCQ

Q1. medium · thorough-understanding · § Introduction **[2]**

A plant bends towards sunlight over several hours, while a cat leaps away from a sudden loud noise in a fraction of a second. Explain the fundamental difference in the nature of the mechanisms responsible for these two types of movement. Why can plants not use the same mechanism as animals for responding to stimuli?

◆ **Control and Coordination**

Q2. deep · thorough-understanding · § Introduction **[3]**

A buffalo continuously chews cud even when there is no new food in its mouth, while a child on a swing pumps her legs in response to feeling herself slow down. Classify each movement as voluntary, involuntary, or reflex, giving a reason for each. Are either of these movements a direct response to an environmental stimulus? Justify your answer.

◆ **Control and Coordination**

Q3. medium · thorough-understanding · § 6.1 ANIMALS – NERVOUS SYSTEM **[3]**

When you accidentally step on a nail, the withdrawal of your foot happens before you consciously feel the pain. Explain why the pain is felt slightly after the foot is withdrawn, and why this delay is actually useful to the body.

◆ **Control and Coordination**

Q4. deep · thorough-understanding · § 6.1 ANIMALS – NERVOUS SYSTEM **[3]**

A student argues: 'Since reflex arcs evolved because the brain is too slow, animals with highly developed brains should eventually lose their reflex arcs as they become unnecessary.' Do you agree? Justify your answer using your understanding of how reflex arcs and the brain function together.

◆ **Control and Coordination**

Q5. medium · thorough-understanding · § 6.1 ANIMALS – NERVOUS SYSTEM **[5]**

[long_answer] You accidentally prick your finger with a pin. Trace the complete path of the nervous impulse — from the moment the pain receptor in your finger detects the stimulus to the moment the muscles in your arm withdraw the hand. Name all the structures the impulse passes through in order, and explain how the signal crosses the gap between two consecutive neurons.

◆ **Control and Coordination**

Q6. medium | thorough-understanding | § 6.1.1 What happens in Reflex Actions? **[3]**

When you accidentally touch a hot object, the withdrawal of your hand is completed before you consciously feel the pain. What does this tell us about where the decision to withdraw is made, and why is this location advantageous?

◆ **Control and Coordination**

Q7. deep | thorough-understanding | § 6.1.1 What happens in Reflex Actions? **[3]**

A student argues: 'Reflex arcs are a primitive leftover — animals with complex brains don't really need them anymore.' Using your understanding of how nervous impulses work, explain why this argument is flawed.

◆ **Control and Coordination**

Q8. deep | thorough-understanding | § 6.1.1 What happens in Reflex Actions? **[3]**

You withdraw your hand from a hot object almost instantly, yet you feel the pain only a moment later. Using your knowledge of the nervous system, explain this time difference. What does it reveal about how information is processed during a reflex action?

◆ **Control and Coordination**

Q9. medium | thorough-understanding | § 6.1.1 What happens in Reflex Actions? **[3]**

Both reflex actions and voluntary actions involve nerve impulses, yet they differ fundamentally in how they are controlled. Distinguish between the two, and explain why mixing up voluntary control for reflex situations could be harmful to an organism.

◆ **Control and Coordination**

Q10. deep | thorough-understanding | § 6.1.2 Human Brain **[3]**

A student argues that since reflex arcs already handle quick responses to danger, the brain's role in the nervous system is redundant. Why is this argument incorrect? Give TWO distinct reasons.

◆ **Control and Coordination**

Q11. medium | thorough-understanding | § 6.1.2 Human Brain **[3]**

When you accidentally step on a nail, you not only pull your foot back instantly but also feel sharp pain a moment later and remember the incident for days. Which parts of the nervous system are responsible for each of these three responses — the instant withdrawal, the sensation of pain, and the memory — and where are these parts located?

◆ **Control and Coordination**

Q12. straightforward | thorough-understanding | § 6.1.2 Human Brain **[1]**

Which part of the brain is most directly involved when a gymnast maintains perfect balance while walking on a beam, and what would happen if this part were damaged?

◆ **Control and Coordination**

Q13. medium | thorough-understanding | § 6.1.2 Human Brain **[2]**

The forebrain receives sensory impulses from the eyes, ears, nose, and skin simultaneously. Explain how the forebrain is able to integrate all this information and generate an appropriate response. Which specific region of the forebrain is responsible for this integration?

◆ **Control and Coordination**

Q14. medium | thorough-understanding | § 6.1.2 Human Brain **[3]**

Classify the following actions as voluntary or involuntary, and for each involuntary action, name the specific part of the nervous system that controls it: (i) writing an answer in an exam, (ii) sneezing when dust enters the nose, (iii) maintaining balance while climbing stairs, (iv) increased heart rate during exercise.

◆ **Control and Coordination**

Q15. deep | thorough-understanding | § 6.1.2 Human Brain **[5]**

A person suffers a stroke that selectively damages the mid-brain and hind-brain, leaving the forebrain completely unaffected. List any FOUR critical body functions that would be disrupted as a result, naming the specific brain region responsible for each, and explain why the person's life would be at risk despite having an intact forebrain.

◆ **Control and Coordination**

Q16. deep | thorough-understanding | § 6.1.3 How are these Tissues protected? **[3]**

The brain is enclosed in a fluid-filled balloon inside a bony box, while the spinal cord runs through the vertebral column. What is the functional advantage of having two different types of protective mechanisms — one for the brain and one for the spinal cord — rather than a single uniform structure protecting both?

◆ **Control and Coordination**

Q17. medium | thorough-understanding | § 6.1.4 How does the Nervous Tissue cause Action? **[3]**

When a nerve impulse travels along a nerve fibre and reaches the point where the nerve meets a muscle, the electrical signal alone cannot directly make the muscle contract. Explain why a chemical step is necessary at this junction, and describe in brief what happens as a result of this chemical step that leads to muscle movement.

◆ **Control and Coordination**

Q18. deep | thorough-understanding | § 6.1.4 How does the Nervous Tissue cause Action? **[3]**

A person suffers nerve damage that prevents electrical impulses from reaching the skeletal muscles of one leg, yet the muscles themselves are perfectly healthy. Predict what will happen to movement in that leg and explain why, connecting the roles of the nervous tissue and muscle tissue in producing movement.

◆ **Control and Coordination**

Q19. deep | thorough-understanding | § 6.2 COORDINATION IN PLANTS **[5]**

A gardener grows two identical seedlings in separate pots. Seedling A is placed near a window with light coming from one side, while Seedling B is kept in complete darkness. After a week, Seedling A bends toward the light but Seedling B grows straight up.

(i) Explain the role of auxin in causing Seedling A to bend toward the light, clearly describing how the unequal distribution of auxin produces directional growth.
(ii) The movement of Seedling A toward light is described as growth-dependent. How is this fundamentally different from the way the leaves of a touch-me-not plant (Mimosa) move when touched? In your answer, refer to the cellular mechanism responsible for each type of movement.

◆ **Control and Coordination**

Q20. deep | thorough-understanding | § 6.2.1 Immediate Response to Stimulus **[3]**

The leaves of a sensitive plant (Mimosa) fold up when touched, even though the point of touch and the point of movement are different parts of the plant. Explain how this movement is brought about, and why it is fundamentally different from how an animal muscle produces movement.

◆ **Control and Coordination**

Q21. medium | thorough-understanding | § 6.2.2 Movement Due to Growth **[2]**

When a pea plant tendril contacts a support, which part of the tendril grows more rapidly — the side touching the support or the side facing away from it? What is the consequence of this difference?

◆ Control and Coordination

Q22. deep | thorough-understanding | § 6.2.2 Movement Due to Growth **[3]**

A gardener places a seedling near a window so that light comes from one side. After a few days, the shoot bends towards the light. If the gardener then rotates the pot so that the illuminated side now faces away from the window, the OLD bent portion of the shoot does NOT straighten back. Why not?

◆ Control and Coordination

Q23. medium | thorough-understanding | § 6.2.2 Movement Due to Growth **[3]**

The roots of a germinating seed always grow downward into the soil, while the shoot grows upward. Name the stimulus responsible for this directional growth. For each organ (root and shoot), state whether its response is positive or negative with respect to that stimulus, and explain the advantage of this arrangement for the seedling.

◆ Control and Coordination

Q24. medium | thorough-understanding | § 6.2.2 Movement Due to Growth **[1]**

Which of the following correctly describes the role of auxin in phototropism?
(A) Auxin is destroyed on the lit side, so cells on that side grow shorter.
(B) Auxin diffuses to the shady side of the shoot, causing cells there to elongate more, bending the plant towards light.
(C) Auxin diffuses to the lit side of the shoot, causing cells there to elongate more, bending the plant away from light.
(D) Auxin is produced equally on both sides of the shoot, but light directly stretches cells on the shady side.

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D Auxin is produced equally on both sides of the shoot, but light directly stretches cells on the shady side.

◆ Control and Coordination

Q25. deep | thorough-understanding | § 6.2.2 Movement Due to Growth **[3]**

Explain why a plant root and a plant shoot respond in opposite directions to the same stimulus of gravity, and suggest how this opposite response is useful to the plant's survival.

◆ Control and Coordination

Q26. medium | thorough-understanding | § 6.2.2 Movement Due to Growth **[1]**

Name ONE plant hormone that promotes cell division. State the type of plant tissue where it is found in greater concentration and briefly explain its role in that tissue.

◆ Control and Coordination

Q27. deep | thorough-understanding | § 6.2.2 Movement Due to Growth **[3]**

A student claims: 'Tropic movements in plants are really the same as the movement of the leaves of a touch-me-not plant — both are just responses to an external stimulus.' Evaluate this claim. In what important way are the two types of movement fundamentally different?

◆ Control and Coordination

Q28. medium | thorough-understanding | § 6.2.2 Movement Due to Growth **[2]**

Both gibberellins and abscisic acid are plant hormones with contrasting roles. Describe the role of each hormone in the plant, and give ONE observable situation in which abscisic acid acts on a plant structure to restrict or slow down a process.

◆ **Control and Coordination**

Q29. straightforward | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[1]**

A squirrel suddenly spots a predator. Which hormone prepares its body for 'fight or flight', and which gland secretes it?

◆ **Control and Coordination**

Q30. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[3]**

Adrenaline causes blood supply to the digestive system and skin to decrease while blood supply to skeletal muscles increases. Explain the physiological mechanism behind this shift and why it is useful during an emergency.

◆ **Control and Coordination**

Q31. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[2]**

Both the nervous system and the endocrine system help animals respond to changes in the environment, yet the body uses hormones rather than nerve impulses to prepare for a fight-or-flight response. Justify this choice by comparing the two systems in terms of the speed, reach, and duration of their effects.

◆ **Control and Coordination**

Q32. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[3]**

A child's diet is consistently deficient in iodine over several years. What visible symptom might develop, and what is the underlying chain of events — from missing nutrient to symptom — that produces it?

◆ **Control and Coordination**

Q33. deep | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[2]**

A child who consumes adequate food still shows stunted physical and mental development. Investigations reveal consistently low levels of thyroxin in the blood. Explain how a deficiency of thyroxin can impair a child's overall development despite sufficient food intake.

◆ **Control and Coordination**

Q34. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[2]**

Deficiency of growth hormone during childhood leads to dwarfism, while its excess can cause gigantism. What does this tell us about the role of the pituitary gland in human growth and development? Which broader part of the brain oversees the functioning of the pituitary gland?

◆ **Control and Coordination**

Q35. straightforward | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[1]**

Which of the following correctly pairs a hormone with its source gland and its primary function?
(A) Insulin — pancreas — regulates blood sugar level
(B) Testosterone — adrenal gland — development of male sex organs
(C) Oestrogen — pituitary gland — regulates menstrual cycle
(D) Adrenaline — thyroid gland — increases heart rate

A Insulin — pancreas — regulates blood sugar level
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◆ **Control and Coordination**

Q36. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[3]**

A diabetic patient's pancreas produces very little insulin. Explain why this leads to harmful effects in the body. If the patient is given regular insulin injections, how does this help restore normal body functioning?

◆ **Control and Coordination**

Q37. medium | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[2]**

The amount of insulin secreted by the pancreas changes automatically as blood sugar levels rise and fall. What is the general name for the type of mechanism that achieves this self-regulation, and how does it operate in this specific case?

◆ **Control and Coordination**

Q38. deep | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[3]**

A student claims: 'Animals do not need hormones for controlling growth because, unlike plants, animals do not show directional growth.' Evaluate this claim using specific examples from the human endocrine system.

◆ **Control and Coordination**

Q39. deep | thorough-understanding | § 6.3 HORMONES IN ANIMALS **[5]**

Compare nervous coordination and hormonal coordination in animals. In your answer, address how they differ in the speed, reach, and duration of their effects, and give one specific example of a biological situation in which each system is better suited to achieve coordination.

◆ **Control and Coordination**

Q40. deep | thorough-understanding | § (whole-chapter synthesis) **[3]**

Both plants and animals use chemical signals for coordination, yet animals also possess a nervous system. Explain why chemical signalling is indispensable in animals even though it is slower than nerve impulses. How does the nature of chemical signalling in plants differ from that in animals in terms of the structural requirements and speed of response?

◆ **Control and Coordination**

Q41. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

When a student accidentally steps on a nail, she withdraws her foot instantly but feels the pain a moment later. Using your understanding of the nervous system, explain why the withdrawal happens before the pain is consciously felt, and identify the structures involved in each part of this sequence.

◆ **Control and Coordination**

Q42. deep | thorough-understanding | § (whole-chapter synthesis) **[1]**

Assertion (A): A person with a damaged cerebellum can still respond to a sudden loud noise by blinking, but struggles to ride a bicycle smoothly.
Reason (R): Reflex actions are mediated by the spinal cord, whereas precise coordination of voluntary movements depends on the cerebellum.
Choose the correct option:
(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true but R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

A Both A and R are true and R is the correct explanation of A.
B Both A and R are true but R is not the correct explanation of A.
C A is true but R is false.
D A is false but R is true.

◆ **Control and Coordination**

Q43. deep | thorough-understanding | § (whole-chapter synthesis) **[3]**

The movement of a touch-me-not leaf and the bending of a shoot towards light both involve cells changing shape. Compare the mechanism by which cells change shape in each case and explain why one movement is almost instantaneous while the other takes hours.

◆ **Control and Coordination**

Q44. deep | thorough-understanding | § (whole-chapter synthesis) **[5]**

A mountaineer stranded in extreme cold notices his heart is racing, his digestion has slowed, and he is breathing faster, even though he is sitting still.
(i) Name the hormone responsible for this state and the gland that secretes it.
(ii) Explain how each of the three physiological changes — increased heart rate, slowed digestion, and faster breathing — helps him survive the emergency.
(iii) Once he is rescued and safe, his body gradually returns to normal. What does this suggest about how hormone action is regulated after the emergency has passed?

◆ **Control and Coordination**

Q45. medium | thorough-understanding | § (whole-chapter synthesis) **[5]**

A child is diagnosed with both iodine deficiency and a deficiency of growth hormone secreted by the pituitary gland. Both conditions affect growth, yet the underlying reasons differ.
(i) Name the hormone whose synthesis is impaired by iodine deficiency and explain how its deficiency leads to a visible symptom in the child.
(ii) Explain how a deficiency of growth hormone leads to a different growth-related outcome compared to iodine deficiency.
(iii) The pituitary gland is often called the 'master gland'. Based on the above scenario, justify this title and explain how the pituitary's control over another gland illustrates the concept of hormonal feedback regulation in the body.

◆ **Control and Coordination**

Q46. medium | thorough-understanding | § (whole-chapter synthesis) **[3]**

Both the nervous system and the endocrine system help animals respond to changes in their environment, yet they are suited to different kinds of responses. Identify ONE situation where the nervous system response would be more appropriate and ONE situation where the hormonal response would be more appropriate. For each, justify your choice by referring to the properties of the respective system.

◆ **Control and Coordination**

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