CHAPTER 7

Control and Coordination

ONE MARK QUESTIONS

1. Name two specialised tissues that provide control and coordination in multicellular organisms.

Ans : [CBSE 2016]

Nervous and muscular tissues.

2. List two body functions that will be affected if cerebellum gets damaged.

Ans : [CBSE 2016]

a. Walking in a straight line.
b. Picking up a thing from the ground.

3. Write the role of motor areas in brain.

Ans : [CBSE 2015]

Motor areas of the brain control the movement of voluntary muscles.

4. Give the scientific names of the following regions of the human brain:
a. Region for sight.
b. Region which controls salivation.

Ans : [CBSE 2015]

a. Temporal lobe (of the forebrain)
b. Medulla (of the hindbrain)

5. All information for our environment is detected by specialised tips of some nerve cells. Write the name given to such tips and also mention where are they located?

Ans : [CBSE 2014]

Receptors. They are located in sense organs.

6. State the function of:
a. gustatory receptors
b. olfactory receptors

Ans : [CBSE 2014]

a. To detect taste.
b. To detect smell.

7. Which part of the nervous system controls reflex arcs?

Ans : [CBSE 2014]

Spinal cord.

8. What type of movement is shown by mimosa plant leaves when touched with a finger?

Ans : [CBSE 20141

Nastic movement.

9. Which tropic movement is responsible for the growth of pollen tubes towards ovules?

Ans : [CBSE 2014]

Chemotropism.

10. Why endocrine glands release their secretions into the blood?

Ans : [CBSE 2014]

It is because endocrine glands are ductless.

11. At the time of puberty, both boys and girls show lots of changes in appearance. Name the hormones responsible for these changes.

Ans : [CBSE 2014]

Testosterone in male and oestrogen in females.

12. Which system facilitates the communication between central nervous system and other parts of the body?

Ans : [CBSE 2013]

Endocrine system.

13. Which gland secretes growth hormone in human beings?

Ans : [CBSE 2013]

Pituitary gland.

14. Which mechanism control timing and amount of hormone released?

Ans : [CBSE 2013]

Feedback mechanism.

15. Define'Chemotropism'.

Ans : [CBSE 2013]

Chemotropism is a nastic response towards the chemicals like the germination of pollen tube when pollen grain lands on stigma.

16. What are hormones?

Ans : [CBSE 2013]

Hormones are the chemical substances secreted in trace amounts by specialised tissue called endocrine glands.

17. Name two tissues that provide control and coordination in multicellular animals.

Ans : [CBSE 2013]

(i) Nervous tissue (ii) Endocrine tissue.

18. What is synapse?

Ans : [CBSE 2013]

Synapse is the functional junction between two neurons. It is a gap junction point between nerve endings of one neuron and dendrites of another neuron.

19. Define 'reflex action'.

Ans : [CBSE 2013]

Reflex action is a sudden, involuntary, spontaneous response to the stimulus that is usually helpful to protect ourselves from any kind of harm.

20. Name the sensory receptors found in the nose and on the tongue.

Ans : [CBSE 2012]

Olfactory receptors, gustatory receptors.

21. Give one example of chemotropism.

Ans : [CBSE 2012]

The growth of pollen tube towards ovule.

22. Name the plant hormone responsible for the promotion of cell division.

Ans : [CBSE 2010]

Cytokinin.

23. How is nerve impulses get transmitted across the synapse?

Ans : [CBSE S.R 2014-15]

Neuron ending transmit the nerve impulse to dendrite of next neuron through the chemical (neurotransmitter).

24. What will happen to a plant shoot if sunlight falls on it from one direction only? What do you call this movement?

Ans : [CBSE S.R 2012-13]

Shoot will bend towards light. Phototropism.

25. How is spinal cord protected?

Ans : [CBSE S.R 2010-11]

Vertebral column made by vertebrae protects the spinal cord.

TWO MARKS QUESTIONS

26. (a) Name one gustatory receptor and one olfactory receptor present in human beings.
(b) Write a and b in the given flow chart of neuron through which information travels as an electrical impulse.
Dendrite ⟶ a ⟶ b⟶ End point of Neuron

Ans : [Al 2018, CBSE 2017]

(a) Tongue / Nose.
(b) a ⟶ Cell body, b ⟶ axon

27. Define neuron. Name the parts of the neuron where:
a. information is acquired.
b. impulse must be converted into a chemical signal for onward transmission?

Ans : [CBSE 2016]

Neuron is a functional and structural unit of nervous system. These cells are specialised for conducting information via electrical impulses from one part of the body to another.
(a) dendrites (b) end of axon.

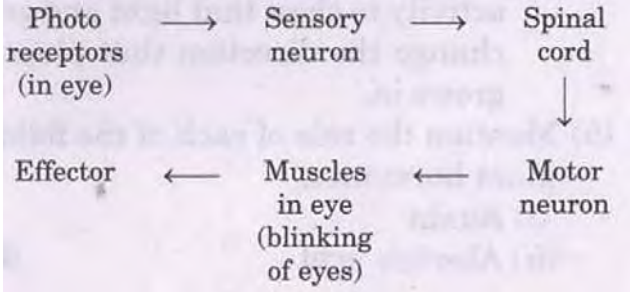
28. Write two differences between the response of the plants and response of the animals to stimuli?

Ans : [CBSE 2015]

	Plants	Animals
1.	No specific or specialized tissue present for conduction of information.	Specialised tissues are present in the body for conduction of information.
2.	Plant cells change shape by changing the amount of water in them.	Specialised proteins are found in muscle cells which help in changing the shape.

29. Trace the sequences of events through a reflex arc which occur when a bright light is focused on your eyes.

Ans : [CBSE 2014]



30. How does feedback mechanism regulate the hormone

secretion?

Ans : [CBSE 2014]

The feedback mechanism regulates the timing and amount of hormone to be secreted, e.g., if a person has more sugar in his blood, this is detected by the cells of the pancreas. As a result, more insulin will be secreted to oxidise the sugar. In a reverse situation, the secretion of insulin will be reduced.

31. What is meant by hydrotropism? Give an example.

Ans : [CBSE 2013]

The response of a plant towards water is called hydrotropism. The roots of plants show positive hydrotropism.

32. Define phototropism and give one example.

Ans : [CBSE 2013]

Movement of plant parts towards the light is called phototropism, e.g., stem of plant usually move towards light.

33. Tendrils encircle or coil around the object in contact with it. Elaborate.

Ans : [CBSE 2011, 2012, 2013]

Tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril to circle around the object and thus, cling to it.

THREE MARKS QUESTIONS

34. Name the hormones secreted by the following endocrine glands and specify one function of each:
(a) Thyroid (b) Pituitary (c) Pancreas

Ans : [All India 2018, CBSE 2017]

a. Thyroid: Secretes Throxine. It regulates metabolism of carbo¬hydrates, fats and proteins.
b. Pituitary: Secretes growth harmone. Growth harmone regulates growth and development of body.
c. Pancreas: Secretes insulin. Insulin lowers blood sugar level.

35. State how concentration of auxins stimulates the cells to grow longer on the side of shoot which is away from light?

Ans : [CBSE S.R 2016-17]

Auxin form in the shoot tip but diffuse toward the part which is in shade/away from the light.

The concentration on shady part increase stimulation cells in this part to elongate. The side of shoot on this side grows longer than the part in light hence bend towards light.

36. Name the hormone which is secreted by the adrenal gland. How does this hormone help to deal with the scary situations?

Ans : [CBSE S.R 2016-17]

Adrenaline. It increase the heart rate, breathing rate so that more blood can be pumped and oxygen can be supplied to the muscles. Blood supply is cut off from skin and sent to muscles. The action of this hormone prepares the person to face the situation so that either he/she may run away or fight.

37. How does chemical coordination occur in plants? Explain with the help of three examples.

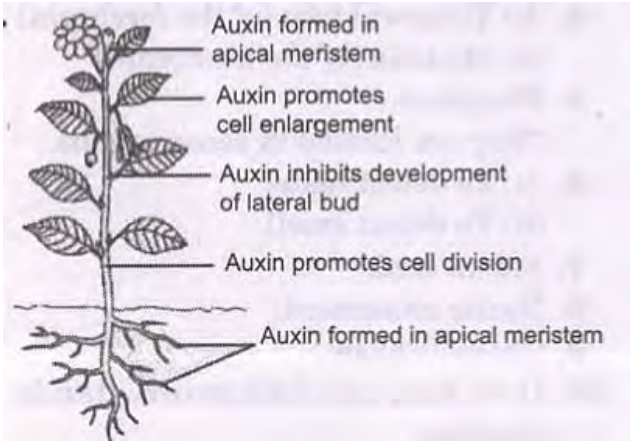
Ans : [CBSE 2014]

In plants, chemical coordination occurs through various phytohormones.

a. Auxins secreted by growing tissues. They provide growth of plants.
b. Gibberelins cause stem elongation, seed germination and flowering.
c. Cytokinins present in areas of actively dividing cells like fruits, seeds. Promote cell division.
d. Abscisic acid inhibits growth and respond to environmental stress.

38. Illustrate with the help of a diagram, the effect of auxins in different parts of a plant.

Ans : [CBSE 2014]



39. a. An old man is advised by his doctor to take less sugar in his diet. Name the disease from which the man is suffering. Mention the hormone due to imbalance of which he is suffering from this disease. Which endocrine gland secretes this hormone?
b. Name the endocrine gland which secretes growth hormone. What will be its effect on a person if there is:
(i) Deficiency of growth hormones?

(ii) Excess secretion of growth hormones?

Ans : [CBSE 2014]

a. The man is suffering with the disease Diabetes. Insulin is the hormone which is responsible for this disease. Pancreas secretes this hormone.
b. Pituitary gland.
   (1) Deficiency of growth hormone causes dwarfism.
   (2) Excess secretion of growth hormone cause gigantism in a person.

40. a. Give the functions of cerebellum (any two).
b. Name the components of central nervous system.

Ans : [CBSE 2014]

a. (i) Cerebellum is responsible for precision of voluntary action.
   (ii) It maintains the posture and balance of the body.
b. The components of central nervous system are: (i) Brain (ii) Spinal cord.

41. a. Identify the phytohormone used by plants while performing the following functions:
   1. Cell division in shoot tip.
   2. Inhibiting growth on approach of unfavourable conditions.
b. List in tabular form two differences between the movement in 'touch me not' plant and movement of shoot towards light.

Ans : [CBSE 2014]

a. (1) Auxin, (2) Abscisic acid.
b.

	Movement of shoot towards light (Phototropism)	Movement in "Touch me not' plant (Nastic movement)
1.	It is slow response towards any stimulus.	It is an immediate response towards a stimulus.
2.	It is directional.	It is non-directional.
3.	It is growth dependent.	It is growth independent.

42. Answer the following:
a. Name the endocrine gland associated with brain.
b. Which gland secretes digestive enzymes as well as hormone?
c. Name the endocrine gland associated with kidneys.
d. Which endocrine gland is present in males but not in females?
e. Which hormone is responsible for changes in females during puberty?
f. Iodine is necessary for the synthesis of which hormone?

Ans : [CBSE 2014]

a. Pituitary gland,
b. Pancreas,
c. Adrenal gland,
d. Testes,
e. Oestrogen,
f. Thyroxine.

43. Give reasons:
a. Pituitary is often termed as master endocrine gland.
b. Pancreas helps in digestion and also regulates blood sugar level.
c. Adrenals are known as glands of emergency.

Ans : [CBSE 2014]

a. Pituitary is often called as master endocrine gland because it controls and coordinates the secretion of all the other endocrine glands.
b. Pancreas secretes pancreatic juice as well as a hormone called as insulin. Pancreatic juice helps in digestion whereas insulin regulates blood sugar level.
c. Adrenalin is secreted directly into the blood and is carried to different parts of the body. It acts on heart. As a result, the heart beats faster in order to supply more oxygen to our muscles. The blood to the digestive system and skin is reduced due to contraction of muscles around small arteries in these organs. This diverts the blood to our skeletal muscles. The breathing rate also increases because of the contractions of the diaphragm and the rib muscles. All these responses together enable the animal body to get ready to deal with the situation.

44. The two glands A and B which occur in pairs are present in endocrine system. The pair of glands A is found only in females whereas the pair of glands B occur only in males. The gland A make and secrete hormone C whereas gland B make and secrete hormone E. In addition to hormone, gland A makes gamete F whereas gland B makes gamete G.
a. What are glands A and B?
b. Name the hormone C and E
c. Name the gamete F and G.

Ans : [CBSE S.R 2013-14]

a. glands A - ovaries B-testes
b. Hormone C - oestrogen E-testosterone
c. The gamete F - ova G-sperms

45. 'Brain and spinal cord are two vital organs of our body'. How is our body designed to protect them?

Ans : [CBSE 2013]

Brain is protected a bony box contained in ' a fluid-filled balloon which protects from shocks.

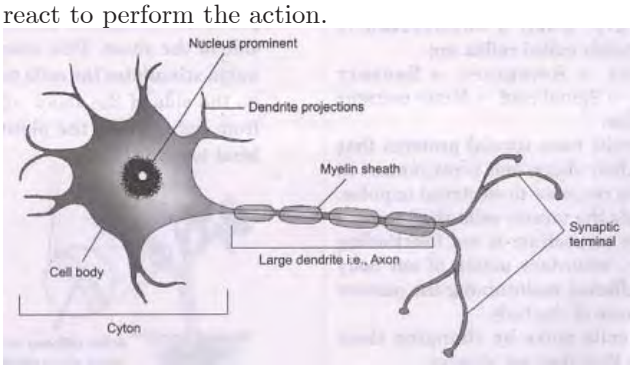
Vertebral column protects the spinal cord or both are protected by protective layers called meninges, protective fluid (CSF ⟶ cerebrospinal fluid).

46. Draw and label a neuron. Explain how it carries messages.

Ans : [CBSE S.P. 2012-13]

Information from the environment is detected by dendritic tip of a neuron located in the sense organ. A chemical reaction sets off here and it creates an electrical impulse which travels from dendrite to cell body and then along the axon to its endings where it sets off the release of some chemicals. The chemicals cross the synapse and set off a similar electrical impulse in dendrites of next neuron. Another synapse

at the end of its axon delivers the impulse to the other cells like muscles cells / glands (effector organs) which react to perform the action.



47. Which hormone is secreted during emergency situations like anger or excitement? How does it help the human body to handle such situations?

or

How does our body respond when adrenaline is secreted in to the blood?

Ans : [CBSE S.R 2012-13]

Adrenaline is secreted during emergency situations. Heart beats faster, supply of more oxygen to muscles, more blood to skeletal muscles, increased breathing rate. It provides energy to muscles to act swiftly.

48. a. Name the part of brain which controls
(1) voluntary action,
(2) involuntary action.
b. What is the significance of the peripheral nervous system? Name the components of this nervous system and distinguish between the origin of the two.

Ans : [CBSE 2012]

a. (1) Voluntary actions - cerebellum;
(2) Involuntary action — medulla oblongata.
b. The communication between the central nervous system and the other parts of the body is facilitated by the peripheral nervous system. Cranial nerves arise from the brain; spinal nerves arise from the spinal cord.

49. a. Name the diseases by which a person is likely to suffer due to the deficiency of: (i) iodine (ii) insulin
b. How the timing of secretion and amount of hormone secretion are regulated in human system. Explain with example.

Ans : [CBSE 2012,13]

a. (i) Goitre (ii) Diabetes.
b. The timing and amount of hormone released are regulated by feedback mechanisms, e.g., if the sugar levels in blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced.

50. a. Differentiate between sensory neurons and motor neurons.
b. How is brain protected in our body? Name the part of the brain responsible for precision of voluntary actions and maintaining body posture and balance of the body.

Ans : [CBSE 2011]

a. Sensory neurons carry impulses from receptors to brain. Motor neurons carry impulses from brain to effectors.
b. The brain is kept inside a bony box (skull). Inside the box, the brain is contained in a fluid-filled balloon which provides further shock absorption. This fluid is known as Cerebrospinal Fluid (CSF).

51. (a) What is reflex arc?
(b) What are the components of reflex arc?
(c) How do muscle cells move?

Ans : [CBSE 2011]

a. The process of detecting the signal or the input and responding to it by an output action might be completed quickly. Such a connection is commonly called reflex arc.
b. Stimulus → Receptors → Sensory neurons → Spinal cord → Motor neurons → Effector.
c. Muscle cells have special proteins that change their shape and arrangement in the cell in response to electrical impulse. This leads the muscle cells shortening.

52. a. If the cerebellum is not functioning properly, what are the activities of our body affected?
b. How do muscle cells move?

Ans : [CBSE 2011]

a. If the cerebellum is not functioning properly, voluntary action of our body will be affected maintaining the posture and balance of the body.
b. Muscle cells move by changing their shape so that they get shorten.

53. a. Name the hormone which is injected to a diabetic patient.
b. Why should we use iodised salt in our diet?
c. If iodine is insufficient in one's diet, what might be the deficiency disease and its symptoms?

Ans : [CBSE 2011]

a. Insulin.
b. Iodine is necessary for the thyroid gland to secrete thyroxine hormone. Thyroxine regulates carbohydrates, proteins and fat metabolism in the body, to provide best balance for growth.
c. If iodine is insufficient in one's diet, iodine deficiency disease called goitre occurs. Symptom is swollen neck.

54. What are hormones? Name the hormone produced by thyroid gland and state its function.

Ans : [CBSE S.R 2010-11]

Chemical coordination in animals occurs through chemicals called hormones which are secreted by endocrine glands. Thyroxin hormone.

It regulates metabolism of carbohydrates, fats and proteins. It is advisable to consume iodized salt in our food as iodine is required by our thyroid gland to produce thyroxin hormone. If it lacks in our body goiter may occur due to enlargement of thyroid in the neck region.

55. Name the hormones secreted by thyroid, parathyroid and pancreas.

Ans : [CBSE S.R 2010-11]

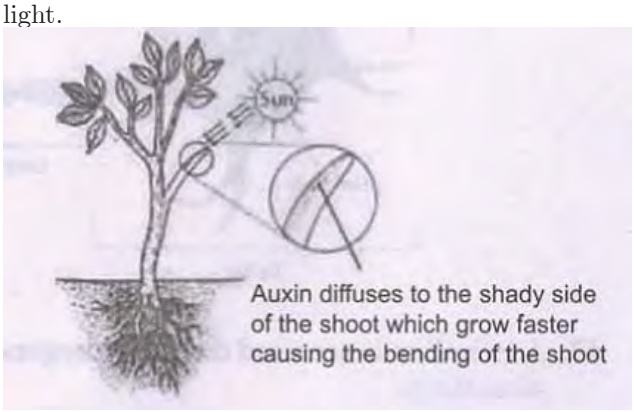
a. Thyroid gland: It secretes thyroxine hormone.
b. Parathyroid gland: It secretes calcitonin hormone.
c. Pancreas: It secretes two hormones:
(a) Insulin (b) Glucagon

56. Name the hormone synthesised at the shoot tips. How does it help the plant to respond to light?

Ans : [CBSE 2010]

Auxin is synthesised at the shoot tips when growing plant detects light and helps the cells to grow longer.

When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light.



FIVE MARKS QUESTIONS

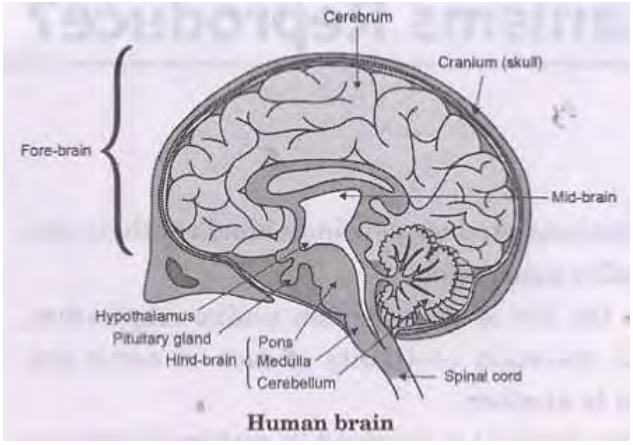
57. Draw a labelled diagram of human brain. Discuss functions of cerebrum, cerebellum and medulla.

or

Draw and describe the role of various parts of human brain.

Ans : [CBSE S.R 2016-17]

Human brain has three major parts:
a. Fore-Brain contains mainly cerebrum.
b. Mid-brain.
c. Hind-brain.



Human brain

Functions
a. Cerebellum which controls posture, balance of body and accurate voluntary movements.
b. Pons regulates respiration
c. Medulla oblongata which controls involuntary actions like blood pressure, salivation, vomiting etc.

58. Give the function(s) of the following plant hormones:
a. Auxins
b. Gibberellins
c. Cytokinins
d. Abscisic acid
e. Ethylene

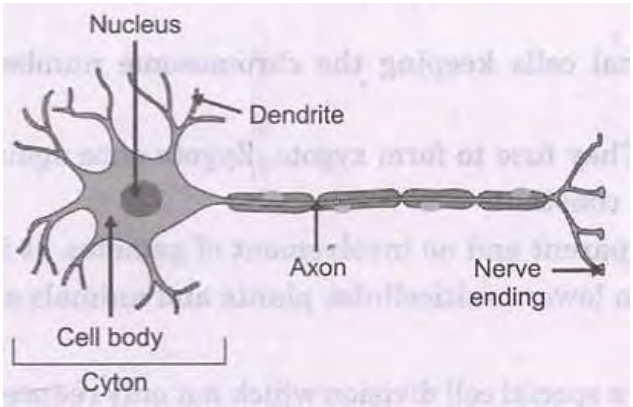
Ans : [CBSE 2015]

a. Auxins promote cell elongation, root formation, cell division, etc. It also promote fruit growth.
b. Gibberellins stimulate stem elongation, seed germination and flowering.
c. Cytokinins help in breaking the dormancy of seeds and buds. They delay ageing in leaves. They also promote the opening of stomata.
d. Abscisic acid promotes falling of leaves and fruits.
e. Ethylene promotes ripening of fruits.

59. (a) Draw the structure of a neuron and label the following on it:
Nucleus, Dendrite, Cell body and Axon.
(b) Name the part of neuron
(i) Where information is acquired.
(ii) Through which information travels as an electrical impulse.

Ans : [CBSE 2013, Al 2008]

a.



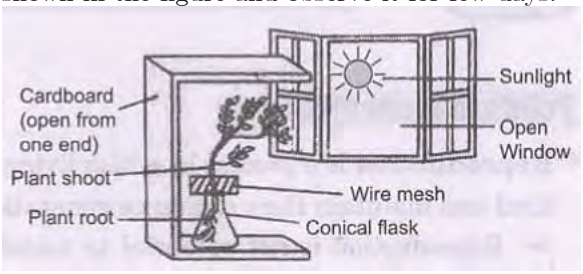
b. (i) Dendrite (ii) Axon.

60. Describe an activity to illustrate the phenomenon of

phototropism and explain why does this occur.

Ans : [CBSE 2013]

a. Take a plant and make such an arrangement that it receives the light coming from a window as shown in the figure and observe it for few days.



b. Now, turn the flask so that the shoots are away from light and the roots towards light. Leave it undisturbed in this condition for a few days.

c. Again, observe carefully to find the difference in the movement.

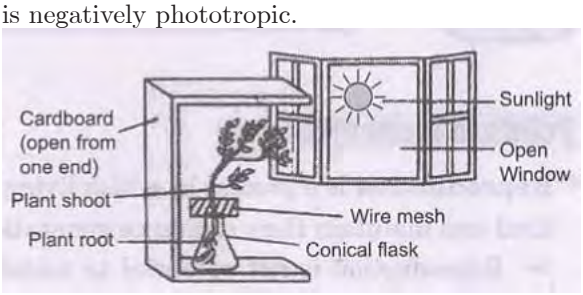
d. When growing plants detect light, auxin, synthesized at the shoot tip, helps the cells to grow longer. Auxin always diffuses towards the shady side of the shoot. This concentrations of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light.

61. (a) What is phototropism and geotropism? With labelled diagrams describe an activity to show that light and gravity change the direction that plant part grows in.

(b) Mention the role of each of the following plant hormones: (i) Auxin (ii) Abscisic acid.

Ans :

a. Phototropism It is tropic movements in the direction of light or away from it e.g. shoots bends towards light while roots grow away from it. Hence shoot is positively phototropic and root is negatively phototropic.



Geotropism: Growth of roots downward towards the earth hence positively geotropic whereas stem grows upward, away from earth, hence it is negatively geographic.

b. Auxins: Synthesized at the shoot tip, helps the cells to grow longer.
Abscisic acid: Inhibits growth, causes wilting and falling of leaves.