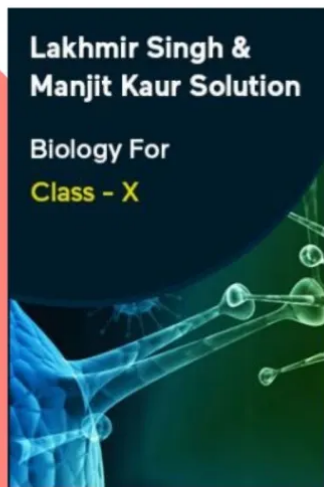


Lakhmir Singh Manjit Kaur Solutions for Class 10 Biology: Chapter 2- Control And Coordination



Lakhmir Singh
Manjit Kaur

CLASS 10 BIOLOGY

Chapter 2: Control And
Coordination

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Very Short Answer Questions

1. What is the general name of chemical substances which bring about control and coordination in plants?

Answer

The chemical substances which bring about the control and coordination in plants are plant hormones.

2. Which plant hormone is responsible for the wilting and falling of leaves?

Answer

The plant hormone responsible for the wilting and falling of leaves is Absciscic acid

3. Which plant hormone makes a stem (or shoot) bend towards light?

Answer

The plant hormone which makes a stem (or shoot) bend towards light sources is Auxin.

4. Where is the auxin hormone made in a plant stem?

Answer

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Auxin hormone is made in the cells of the tip of a plant stem.

5. What is the scientific name of sensitive plant?

Answer

Mimosa pudica is the scientific name of sensitive plant .

6. Name one plant hormone that promotes growth and another plant hormone which inhibits growth?

Answer

The plant hormone that promotes growth in plants is auxin and hormone that inhibits growth abscisic acid.

7. Name one example of the movement of a plant part which is very quick and can be observed easily.

Answer

The movement of plant, especially prevalent in sensitive plants, which is very quick and can be observed easily is Thigmonasty. On touching the leaves of the plant, they shut the leaves and droop.

8. Name the type of chemical substances that control the growth in plants.

Answer

Plant hormones are the chemical substances that control growth in plants. Auxin, gibberellins, cytokinins and abscisic acid are examples of plant hormones.

9. What is the stimulus in:

(a) Phototropism

(b) Geotropism

(c) Chemotropism

(d) Hydrotropism

(e) Thigmotropism?

Answer

The stimulus in

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- (a) Light
- (b) Gravity
- (c) Chemicals
- (d) Water
- (e) Touch

10. Give the scientific terms used to represent the following :

- (a) Bending of a shoot towards light.**
- (b) Growing of roots towards the earth.**
- (c) Growth of a pollen tube towards ovule.**
- (d) Bending of roots towards water.**
- (e) Winding of tendril around a support.**

Answer

- (a) Phototropism
- (b) Geotropism
- (c) Chemotropism
- (d) Hydrotropism

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(e) Thigmotropism

11. Give one example of the movement of a plant part which is caused by the loss of water (or migration of water).

Answer

The shutting and drooping of leaves in a sensitive plant is the movement of a plant which is caused by the loss of water (or migration of water).

12. Give one example each of a plant part :

(a) Which is positively hydrotropic as well as positively geotropic.

(b) Which is positively phototropic but negatively geotropic.

Answer

(a) Roots

(b) Shoots

13. Which of the following is a growth movement and which is not?

(a) folding up of leaves of sensitive plant on touching with hand.

(b) folding up of petals of dandelion flower when light fades.

Answer

None of the given conditions are growth movements. They come under the category of nastic movements.

(a) Thigmonastic movement

(b) Photonastic movement.

14. Name the plant part:

(a) which bends in the direction of gravity but away from light

(b) which bends towards light but away from the force of gravity

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Answer

(a) Roots (b) Shoots

15. To which directional stimuli do :

(a) roots respond?

(b) Shoots respond?

Answer

(a) Gravity

(b) Light

16. Fill in the following blanks:

(a) A plant's response to light is called _____

(b) A plant's response to gravity is called _____

(c) Plant shoot grows upward in response to _____

(d) Plant roots grow downward in response to _____

(e) Tendrils wind around a support in response to _____

(f) Plant roots grow towards _____ and in the direction of force of _____

(g) A root of a plant grows downward. This is known as _____

(h) _____ is the hormone that causes phototropism in plants

(i) The response of leaves to the sunlight is called _____

Answer

(a) A plant's response to light is called phototropism.

(b) A plant's response to gravity is called geotropism.

(c) Plant shoot grows upward in response to light.

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- (d) Plant roots grow downward in response to gravity.
- (e) Tendrils wind around a support in response to touch.
- (f) Plant roots grow downwards and in the direction of the force of gravity.
- (g) The root of a plant grows downward. This is known as geotropism.
- (h) Auxin is the hormone that causes phototropism in plants.
- (i) The response of leaves to sunlight is called phototropism.

Short Answer Type Questions

17. Plant parts show two types of movements, one dependent on growth and other independent of growth. Give one example of the movement in plant parts:

- (a) which depends on growth**
- (b) which does not depend on growth**

Answer

- (a) Phototropism. The growth of plant stem in response to sunlight.
- (b) Thigmonasty. The non-directional movement of plant part, such as leaves, in response to touch.

18. What is a plant hormone? Name four plant hormones. State one function of each.

Answer

Hormones are the chemicals responsible for the function of control and coordination in plants are called plant hormones.

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The four plant hormones and their functions are as follows:

1) Auxin: Helps in enlargement and differentiation of cells.

2) Gibberellins: It breaks the dormancy in seeds and buds.

3) Cytokinins: Helps in functioning of cell division.

4) Absciscic acid: Helps in closing the stomatal pores.

19. (a) What does a root do in response to gravity? What is this phenomenon known as?

(b) What does a stem (or shoot) do in response to light? What is this phenomenon known as?

Answer

(a) In response to gravity the roots of a plant grow downwards. This phenomenon is known as geotropism.

(b) In response to light the stem grows upwards. This phenomenon is known as phototropism.

20. (a) What does a stem (or shoot) do in response to gravity? What is this phenomenon known as?

(b) What does a root do in response to light? What is this phenomenon known as?

Answer

(a) In response to gravity stem always grows up and away from the gravitational pull. This phenomenon is known as negative geotropism.

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(b) In response to light root always grows downwards and away from light. This phenomenon is known as negative phototropism.

21. (a) What does a Mimosa pudica plant do in response to touch? What is this phenomenon known as?

(b) What happens to the dandelion flower (i) during daytime, and (ii) at night? What is this phenomenon known as?

Answer

(a) Mimosa pudica (Touch me not) folds its leaves and droops when touched. This phenomenon is known as thigmonasty.

(b)(i) opens up during the day. (ii) It closes in the night.

This phenomenon is known as photonasty.

22. (a) What does a plant root do in response to water? What is this phenomenon known as?

(b) What happens to the moonflower (i) during daytime, and (ii) at night? What is this phenomenon known as?

Answer

(a) The plant's root moves towards water. This phenomenon is known as positive hydrotropism.

(b) (i) Closes during the day. (ii) Opens during the night.

This phenomenon is known as photonasty.

23. What is a tendril? Name the two types of tendrils. What does a tendril do in response to the touch of support? What is this phenomenon known as?

Answer

The thin thread-like growth on the stems or leaves of a climbing plant is called tendril. Stem tendrils and leaf tendrils are the two types of tendrils.

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The phenomenon is known as thigmotropism.

24. Name the five types of tropisms. How are tropic movements helpful to plants? Explain with an example.

Answer

The five types of tropisms are phototropism, geotropism, hydrotropism, chemotropism and thigmotropism. Tropic movements are helpful in the growth of plants.

Phototropism: The stems of plants respond to sunlight by growing towards it. The plants also turn their leaves to face the sun. This enables their leaves to get as much sunlight as possible that is required for photosynthesis.

Question 25:

25. Define chemotropism. Give one example of chemotropism. State whether this example is of positive chemotropism or negative chemotropism.

Answer

The growth of plant parts in response to chemical stimulus is known as chemotropism.

The growth of a pollen tube towards the ovule induced by a sugary stimulus is an example of chemotropism. This is an example of positive chemotropism as the pollen tube grows towards the stimulus.

26. Distinguish between tropic movements and nastic movements in plants. Give examples to illustrate your answer.

Tropic movements	Nastic movements
The directional movements of plants in response to stimulus.	The non-directional movements of plants in response to stimulus.
Example: The downward growth of a plant's root in response to gravity. It is known as geotropism.	Example: The folding and drooping up of leaves in response to touch. It is known as thigmonotopism.

27. (a) What is meant by nastic movements in plants? Give one example of nastic movements in plants.

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(b) What is the difference between photonasty and thigmonasty?

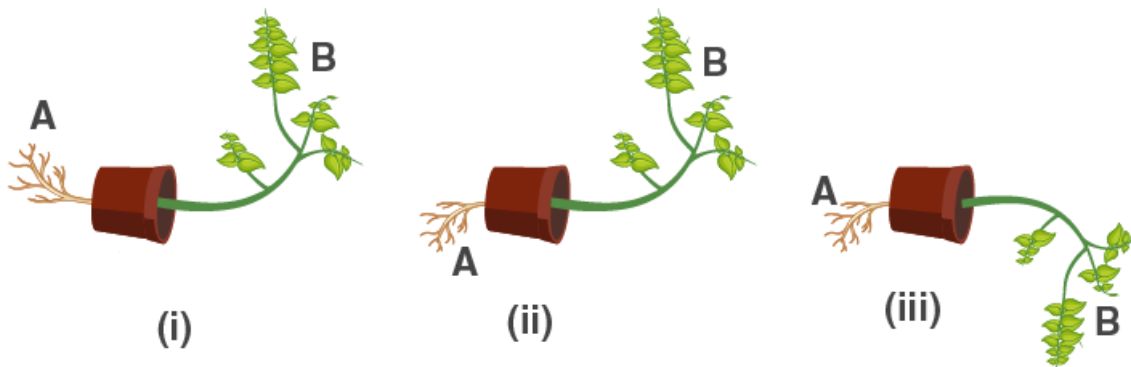
Answer

(a) The non-directional movement of a plant part in response to an external stimulus is known as nastic movement. Example: The folding and drooping up of leaves in sensitive plants in response to touch.

(b) Photonasty: The non-directional movement in plants in response to light. Example: Sunflower plant

Thigmonasty: The non-directional movement of plants in response to touch. Example: Touch me not plant.

28. A potted plant is kept horizontally for a considerable time. The three positions of the parts A and B of the potted plant are shown in the following figures:



(a) Which figure shows the correct position taken by the parts A and B of the plant?

(b) What type of phenomenon is exhibited by the figure chosen in (a) above?

(a) Figure 2

(b) The phenomenon exhibited in this figure is geotropism. Roots of a plant show positive geotropism, whereas stems show negative geotropism.

29. Name the plant hormones which are responsible for the following effects:

(a) falling of leaves

(b) opening of stomata

(c) bending of stem towards light

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(d) closing of stomata

Answer

(a) Absciscic acid

(b) Cytokinins

(c) Auxins

(d) Absciscic acid

30. Name the plant organs which are:

(a) positively phototropic

(b) positively geotropic

(c) negatively geotropic

(d) positively hydrotropic

Answer

(a) Stem

(b) Roots

(c) Stem

(d) Roots

31. Why is the folding up of the leaves of a sensitive plant on touching with a finger not a tropism?

Answer

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The folding up of leaves in a sensitive plant on touching is not a tropism because it is a non-directional movement. Tropism is a directional movement where the parts of plant move in a particular direction with response to stimulus.

32. Why is the closing of a dandelion flower at dusk (when it gets dark) not a tropism?

Answer

The closing of a dandelion flower at dusk is not a tropism because it is a non-directional movement in response to the intensity of light. Tropism is a directional movement where the parts of plant move in a particular direction with response to stimulus. The intensity of light is not a keen factor.

Long Answer Type Questions

33. (a) What is meant by 'tropisms' (or tropic movements)? Explain with an example.

(b) What are the different types of tropisms? Define each type of tropism. Write the name of stimulus in each case.

(c) How do tropisms differ from nasties (or nastic movements)?

Answer

(a) Tropism is a directional movement where the parts of plant move in a particular direction with response to stimulus. Example- Geotropism: Growth of roots towards gravity

(b) The different types of tropisms are:

(i) Phototropism: The movement of plant parts in response to light is known as phototropism.

(ii) Geotropism: The movement of plant parts in response to gravity is known as geotropism.

(iii) Hydrotropism: The movement of plant parts in response to water is known as hydrotropism.

(iv) Chemotropism: The movement of plant parts in response to chemicals is known as chemotropism.

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(v) Thigmotropism: The movement of plant parts in response to touch is known as thigmotropism.

(c) Tropism: Tropism is a directional movement where the parts of plant move in a particular direction with response to stimulus.

Nasties: The non-directional movements of plant parts in response to an external stimulus.

34. (a) Define phototropism. Give one example of phototropism.

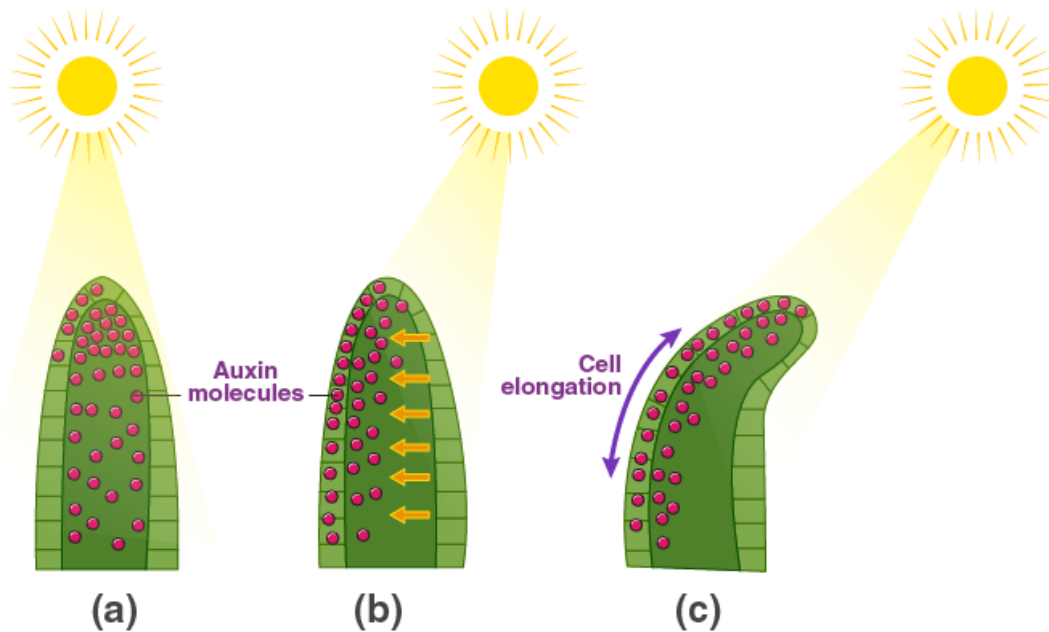
(b) How does phototropism occur in a plant stem (or shoot)? Explain with the help of labeled diagrams.

(c) What is meant by positive phototropism and negative phototropism? Give one example of each type.

Answer

(a) The growth of plant parts in response to light is known as phototropism. Example: Growth of plant's stem in the direction of light.

(b) Positive phototropism: The stems of plants grow towards sunlight.



(c) The movement of plant parts towards the light source is known as positive phototropism, whereas the movement of plant parts away from light is known as negative phototropism.

Positive phototropism is shown by stems and negative phototropism is shown by roots.

35. (a) Define geotropism. Give one example of geotropism.

(b) What is meant by 'positive geotropism' and 'negative geotropism'? Give one example of each type. Draw a labeled diagram to illustrate your answer indicating the plant part which shows positive geotropism and the plant part which shows negative geotropism.

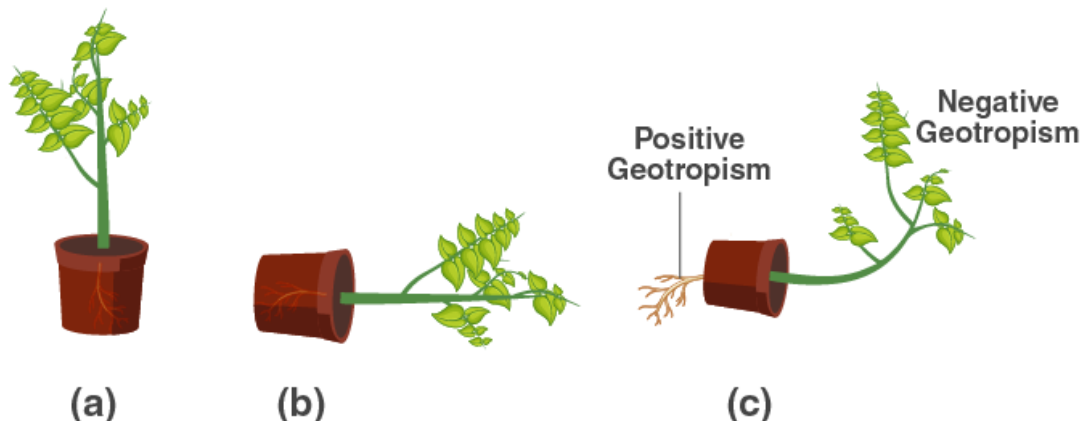
(c) Name one plant part which exhibits positive thigmotropism.

Answer

(a) The movement of plant parts in response to gravity is known as geotropism. Example: Growth of roots towards gravity.

(b) The movement of the plant parts is towards the pull of gravity, which is called positive geotropism. The movement of the plant parts opposite to the pull of gravity is called negative geotropism.

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(c) Tendrils or climbing organs of a plant exhibit positive thigmotropism.

36. (a) How does control and coordination take place in plants? How does it differ from that in animals?

(b) Name five stimuli which act on plants. Name the type of tropism produced by each one of these stimuli.

(c) Define hydrotropism. Give one example of hydrotropism. State whether this example is of positive hydrotropism or negative hydrotropism. Illustrate your answer with the help of the labeled diagram.

Answer

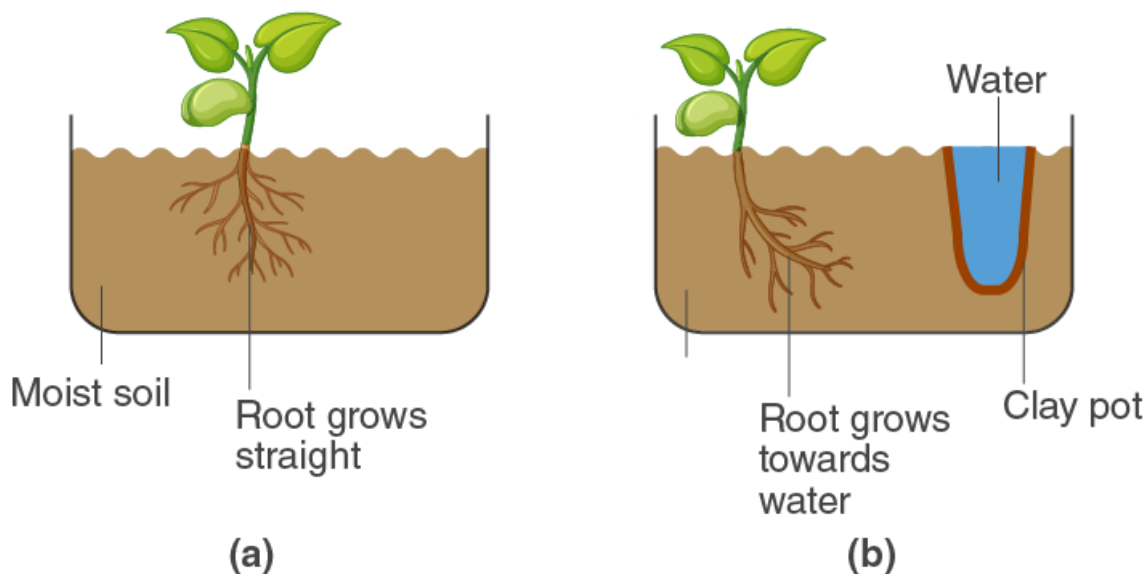
(a) Control and coordination occur in plants with the help of hormones. It differs from animals because animals have nervous system and plants do not have.

(b) The five types of stimuli and the tropisms produced by each of them are:

1. Light -phototropism
2. Water – hydrotropism
3. Touch- thigmotropism
4. Chemicals -chemotropism
5. Gravity – geotropism

(c) The movement of plant parts in response to water is known as hydrotropism. The movement of plant roots towards water is hydrotropism. It is a positive hydrotropism because the roots move towards the stimulus.

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37. (a) What is meant by positive tropism and negative tropism? Explain with examples.

(b) Define thigmotropism. Give one example of thigmotropism.

(c) What is the difference between thigmotropism and thigmonasty? Name one plant which exhibits thigmotropism and one plant which exhibits thigmonasty. What behaviour (or responses) of these plants make you think that they exhibit thigmotropism and thigmonasty respectively?

Answer

(a) The movement of the response towards the stimulus, it is known as positive tropism. The movement of the response opposite to the direction of the stimulus, is known as negative tropism.

The movement of roots towards the pull of gravity is an example of positive geotropism, the movement of plant stem opposite to the direction of gravitational pull is negative geotropism.

(b) The directional movement of plant parts in response to touch is known as thigmotropism. The movement of tendrils of climbing plants towards the things they happen to touch is an example of thigmotropism.

(c)

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Thigmotropism

It is a directional movement of plant parts in response to touch.

Example: Bitter gourd

Thigmonasty

It is a non-directional movement of plant parts in response to touch.

Example: *Mimosa pudica*

Bitter gourd exhibits thigmotropism as its tendrils show directional movement on touching. *Mimosa pudica* exhibits thigmonasty as its leaves show non-directional movement in response to touch.

Multiple Choice Questions

38. Which of the following is not a plant hormone?

- (a) auxin
- (b) ascorbic acid
- (c) cytokinin
- (d) abscisic acid

Answer

- (b) ascorbic acid

39. One of the following plant hormones is responsible for the phenomenon of phototropism in plants. This is:

- (a) gibberellin
- (b) eltroxin
- (c) cytokinin
- (d) auxin

Answer

- (d) auxin

40. The movement of a plant part in response to the force of attraction exerted by the earth is called :

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- (a) hydrotropism
- (b) geotropism
- (c) chemotropism
- (d) phototropism

Answer

- (c) geotropism

41. The movement of sunflower in accordance with the path of the sun is due to :

- (a) photonasty
- (b) phototropism
- (c) hydrotropism
- (d) chemotropism

Answer

- (a) photonasty

42. The plant part which exhibits negative geotropism is :

- (a) root
- (b) stem
- (c) branch
- (d) leaves

Answer

- (b) stem

43. A big tree falls in a forest but its roots are still in contact with the soil.

The branches of this fallen tree grow straight up (vertically). This happens in response to

- (a) water and light
- (b) water and minerals

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(c) gravity and water

(d) light and gravity

Answer

(d) light and gravity

44. Which of the following is not caused by a growth movement?

(a) bending of the shoot of a plant in response to light

(b) closing up of leaves of a sensitive plant on touching with an object

(c) climbing up of a plant on an object by using tendrils

(d) movement of the root of a plant towards a source of water

Answer

(b) closing up of leaves of a sensitive plant on touching with an object

45. The root of a plant is :

(i) positively phototropic but negatively geotropic

(ii) positively geotropic but negatively phototropic

(iii) negatively phototropic but positively hydrotropic

(iv) negatively hydrotropic but positively phototropic

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)

Answer

(b) (ii) and (iii)

46. The main function of the plant hormone called abscisic acid is to:

(a) increase the length of cells

(b) promote cell division

(c) inhibit growth

(d) promote growth of stem and roots

Answer

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(c) inhibit growth

47. The growth of tendrils in pea plants is due to the:

- (a) effect of sunlight on the tendril cells facing the sun**
- (b) effect of gravity on the part of tendril hanging down towards the earth**
- (c) rapid cell division and elongation in tendril cells that are away from the support**
- (d) rapid cell division and elongation in tendril cells in contact with the support**

Answer

(d) rapid cell division and elongation in tendril cells in contact with the support

48. Which of the following phytohormone is not associated with the promotion of growth in plants?

- (a) auxin**
- (b) abscisic acid**
- (c) gibberellin**
- (d) cytokinin**

Answer

(b) Absciscic acid

49. The plant hormone which triggers the fall of mature leaves and fruits from the plant body is :

- (a) auxin**
- (b) gibberellin**
- (c) abscisic acid**
- (d) cytokinin**

Answer

(c) abscisic acid

50. Which of the following terms denotes the movement of the root of a plant towards moisture in the soil?

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(a) thigmotropism

(b) chemotropism

(c) hydrotropism

(d) geotropism

Answer

(c) Hydrotropism

51. The growth of a pollen tube towards the ovule caused by a sugary substance as stimulus is an example of:

(a) phototropism

(b) chlorotropism

(c) gravitropism

(d) chemotropism

Answer

(d) Chemotropism

52. The bending of the shoot of a plant in response to light is called:

(a) geotropism

(b) phototropism

(c) thigmotropism

(d) photonasty

Answer

(b) phototropism

53. The stimulus in the process of thigmotropism is:

(a) touch

(b) gravity

(c) light

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(d) chemical

Answer

(a) touch

54. A growing seedling is kept in a dark room. A burning candle is placed near it for a few days. The top part of seedling bends towards the burning candle. This is an example of:

(a) chemotropism

(b) hydrotropism

(c) phototropism

(d) geotropism

Answer

(c) Phototropism

55. Which of the following acts as a stimulus in the process of hydrotropism?

(a) Hydrocarbon

(b) hydrogen oxide

(c) hydrogen chloride

(d) hydrogen peroxide

Answer

(b) Hydrogen oxide

56. The growth movement of a plant part in response to the touch of an object is called :

(a) thigmonasty

(b) hydrotropism

(c) thigmotropism

(d) geotropism

Answer

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(c) thigmotropism

57. The climbing organs of plants like tendrils grow towards any support which they happen to touch and wind around the support. This is an example of:

(a) chemotropism

(b) nastic movement

(c) thigmotropism

(d) geotropism

Answer

(c) thigmotropism

Question 58:

The rate of growth in roots is decreased by one of the following plant hormones. This plant hormone is:

(a) gibberellin

(b) auxin

(c) cytokinin

(d) ethene

Answer

(b) auxin

59. When the leaves of a *Mimosa pudica* plant are touched with a finger, they fold up quickly. This is an example of:

(a) chemotropism

(b) thigmonasty

(c) photonasty

(d) thigmotropism

Answer

(b) thigmonasty

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60. Dandelion flowers open the petals in bright light during the daytime but close the petals in dark at night. This response of dandelion flowers to light is called :

- (a) phototropism**
- (b) thigmonasty**
- (c) chemotropism**
- (d) photonasty**

Answer

- (d) photonasty**

61. To which of the following directional stimulus roots of a plant do not respond?

- (a) Moisture**
- (b) candle light**
- (c) touch**
- (d) gravity**

Answer

- (c) Touch**

62. One of the following is not caused by the growth-related movement of the concerned plant part. This is:

- (a) phototropism**
- (b) photonasty**
- (c) thigmonasty**
- (d) thigmotropism**

Answer

- (c) thigmonasty**

63. The bending of the root of a plant away from a source of light is caused by a plant hormone called:

- (a) cytokinin**

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(b) gibberellin

(c) abscisic acid

(d) auxin

Answer

(d) auxin

64. Most of the plant hormones promote plant growth. A plant hormone which inhibits growth is:

(a) abscisic acid

(b) ethene

(c) ascorbic acid

(d) cytokinin

Answer

(a) abscisic acid

65. The movement of a shoot towards light is :

(a) geotropism

(b) hydrotropism

(c) chemotropism

(d) phototropism

Answer

(d) phototropism

66. The bending of the stem of a plant towards a source of light is caused by the action of a phytohormone known as:

(a) abscisic acid

(b) auxin

(c) gibberellins

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(d) cytokinin

Answer

(b) auxin

67. Which of the following plant part exhibits negative phototropism?

(a) root

(b) branch

(c) leaves

(d) stem

Answer

(a) Root

68. Which of the following are not tropisms?

(i) growing of pollen tube in response to a sugary substance

(ii) folding up of leaves of sensitive plant in response to touch

(iii) winding of tendril around a support in response to touch

(iv) opening up of the leaves of a daisy flower in response to light

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (ii) and (iv)

Answer

(d) (ii) and (iv)

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Very Short Answer Questions

1. Name the two systems of control and coordination in higher animals.

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Answer

Nervous system and the endocrine system are the two systems of control and coordination in higher animals.

2. What are the two parts of the vertebrate nervous system?

Answer

The central nervous system and the peripheral nervous system are the two parts of the vertebrate nervous system.

3. If we happen to touch a hot object unknowingly, we immediately pull back our hand. What is this type of action known as?

Answer

After touching a hot object unknowingly, the hand is automatically pulled back this type of action is known as a reflex action.

4. Name the three components of a neuron (or nerve cell).

Answer

The three components of a neuron (or a nerve cell) are:

- Cell body
- Dendrites
- Axon

5. (a) What are the short fibers of a neuron known as?

(b) What is the long fiber of a neuron known as?

Answer

(a) Dendrites.

(b) Axon.

6. Name the most important part of the human brain.

Answer

The cerebrum (forebrain) is the most important part of the human brain.

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7. Which part of the brain maintains posture and balance of the body?

Answer

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

8. State one function each of the cerebellum and pons.

Answer

Pons: Helps in regulating respiration.

Cerebellum: Helps in maintaining balance and posture of the body.

9. Name one hormone secreted by the pituitary gland.

Answer

Growth hormone in humans is secreted by the pituitary gland.

10. Where are hormones made in the human body?

Answer

Endocrine glands help to make the hormones in the human body.

11. What is the name of the system of glands which produces hormones?

Answer

The system of glands that produces hormones is called the endocrine system.

12. Which gland secretes the growth hormone?

Answer

The growth hormone is secreted by pituitary gland.

13. Name the hormones secreted by (a) testes, and (b) ovaries

Answer

(a) Testosterone.

(b) Oestrogen and progesterone.

14. What are the scientific names for the following receptors in animals?

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- (a) Receptors for light
- (b) Receptors for heat
- (c) Receptors for sound
- (d) Receptors for smell
- (e) Receptors for taste

Answer

- (a) Photoreceptor
- (b) Thermoreceptor
- (c) Phonoreceptor
- (d) Olfactory receptors
- (e) Gustatory receptors

15. Name the disease caused by the deficiency of insulin hormone in the body.

Answer

The deficiency of a hormone known as insulin causes Diabetes.

16. Name the disease caused by the deficiency of thyroxine hormone in the body.

Answer

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The disease caused by the deficiency of thyroxine hormone in the body is Goitre.

17. Which halogen element is necessary for the making of thyroxine hormone by the thyroid gland?

Answer

The halogen element is necessary for the making of thyroxine hormone by the thyroid gland is Iodine.

18. Why are some patients of diabetes treated by giving injections of insulin?

Answer

Diabetes is caused by high sugar level in blood. Diabetic patients are treated by giving injections of insulin as it lowers the blood sugar level by controlling the metabolism of sugar.

19. What is the name of in-built 'arrangement' in our body which controls the timing and amount of hormones released by various endocrine glands in the body?

Answer

The in-built arrangement in our body that controls the timing and amount of hormones released by various endocrine glands is feedback mechanism.

20. Name one gland each :

(a) which acts only as an endocrine gland.

(b) which acts only as an exocrine gland.

(c) which acts both as an endocrine gland as well as an exocrine gland.

(a) Thyroid

(b) Salivary gland.

(c) Pancreas

21. What part does the diet play in helping us to have a healthy thyroid gland?

Answer

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The proper functioning of the thyroid gland is carried when adequate amount of Iodine is taken in our diet.

22. If sugar is detected in the urine of a person, name the disease he is suffering from.

Answer

The person suffers from diabetes, if sugar is detected in urine.

23. Name two parts of the body that contain receptors of chemical stimuli.

Answer

The parts of the body which contain receptors of chemical stimuli are nose and tongue.

24. Which part of the eye contains cells which are sensitive to light?

Answer

The retina of an eye contains light-sensitive cells.

25. What are the two main communications systems in an animal's body?

Answer

The two main communication systems in an animal's body are nervous system and endocrine system.

26. Which one term in each of the following includes the other three?

(a) thyroid, ductless gland, thymus, pituitary, ovary

(b) adrenalin, insulin, hormone, thyroxine, estrogen

Answer

(a) Ductless glands.

(b) Hormones.

27. Which parts of the body form the central nervous system?

Answer

The brain and spinal cord form the central nervous system.

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28. Give three examples of reflex actions.

Answer

Examples of reflex actions:

- Blinking of eyes
- Withdrawal of hand when hit by a sharp object
- Coughing

29. Why do you need iodine in your diet?

Answer

Iodine is needed in our diet because it helps the thyroid gland in producing thyroxine hormone.

30. State whether coughing is a voluntary action or reflex action.

Answer

Coughing is a reflex action.

31. Fill in the following blanks with suitable words:

(a) The two examples of effectors are _____ and _____

(b) Our _____ system allows us to react to our surroundings. Information from receptors passes along _____ neurons to our brain. Our brain sends impulses along _____ neurons to our muscles.

(c) A neuron which carries an impulse to the brain is called a _____ neuron.

(d) The neuron which carries a message for action to a muscle or gland is known as _____ neuron.

Answer

(a) The two examples of effectors are muscles and glands.

(b) Our nervous system allows us to react to our surroundings. Information from receptors passes along the sensory neurons to our brain. Our brain sends impulses along the motor neurons to our muscles.

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(c) A neuron which carries an impulse to the brain is called a sensory neuron.

(d) A neuron that carries a message for action to a muscle or a gland is known as a motor neuron.

Short Answer Type Questions

32. (a) What are the various sense organs in our body?

(b) What is meant by receptors and effectors? Give two examples of each.

Answer

(a) The various sense organs in our body are: eyes, ears, nose, tongue and skin.

(b) The cell present in the sense organs that is sensitive to specific stimuli is called receptor.

Example: Tongue can detect taste, Nose can detect smell

The part of body which can respond to a stimulus according to the instructions given from the nervous system is called an effector.

Example: Muscles

33. (a) What is spinal cord? What is its main function?

(b) Give the functions of medulla.

(a) Spinal cord is a cylindrical structure made up of nervous tissue, extends from medulla to the lumbar region of vertebral column by a bony cage called the vertebral column. The spinal cord is responsible for spinal reflex actions and the conduction of nerve impulses from the brain.

(b) The medulla controls various involuntary actions such as the heartbeat, breathing, blood pressure and peristaltic movements of the alimentary canal.

34. (a) Name the three types of nerves which constitute the peripheral nervous system.

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(b) What is the difference between a reflex action and walking?

(c) How do we detect the smell of an incense stick (agarbatti)?

Answer

(a) The types of nerves which make up the peripheral nervous system are: spinal nerves, cranial nerves, visceral nerves.

(b) Reflex action: Involuntary action that is rapid and automatic response to stimuli. It is not under the voluntary control of the brain.

Walking: It is voluntary action which is done and is controlled by the action of brain. The central nervous is a part of this voluntary action.

(c) The olfactory receptors present in our nose helps to detect the smell of an incense stick. These receptors through electrical signals send the information to brain. Then the brain interprets this information as the smell of incense stick where it has been already stored.

35. (a) What substances are made by endocrine glands?

(b) What is the function of receptors and effectors in our body?

Answer

(a) The chemical substances called hormones are secreted by endocrine glands.

(b) Receptors detect the information from stimuli. Effectors responds to electrical impulses sent by nervous system.

36. (a) Name the hormones secreted by the following endocrine glands :

(i) Thyroid gland

(ii) Parathyroid glands

(iii) Pancreas

(iv) Adrenal glands

(b) Write the functions of testosterone and oestrogen hormones.

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Answer

(a)(i) Thyroxine

(ii) Parathormone

(iii) Insulin

(iv) Adrenaline

(b) Testosterone hormone controls the development of male sex organs and male characters such as of voice, moustache, beard and other body hair.

Oestrogen hormone controls the development of female sex organs and female characters such as voice and soft skin.

37. (a) Write the names of the regions in hindbrain. Give one function of each region.

(b) Name the function of cerebrum.

Answer

(a) The three regions in hind brain are: Pons, Cerebellum and Medulla.

Pons: Help in regulating the respiration.

Cerebellum: Helps in maintaining posture and balance of the body.

Medulla: Helps in controlling the various involuntary actions such as the heartbeat, breathing, blood pressure and peristaltic movements of the alimentary canal.

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(b) Cerebrum: It is known as the logical part of the brain. It helps in building logical skills like learning, reasoning, intelligence, personality and memory. The thoughts, sensations, actions and movements are controlled by the cerebrum.

38. (a) The human brain can be broadly divided into three regions. Name these three regions.

(b) What is cranium? What is its function?

Answer

(a) The human brain can be broadly divided into three regions: the forebrain, the midbrain and the hindbrain.

(b) The cranium is a bony box in the skull. The main function of cranium is to protect the brain.

39. (a) How does chemical coordination take place in human beings?

(b) Why is the use of iodized salt advisable?

Answer

(a) Chemical coordination takes place through hormones in human beings. Hormones help the brain in controlling the actions and pace of developments in our body.

(b) Iodized salt contains iodine which helps in building thyroxine produced by the thyroid gland.

40. What is the function of insulin hormone? What type of patients are given insulin injections?

Answer

The function of insulin hormone is to regulate the blood sugar level. The metabolism of sugar is maintained by insulin. Diabetic patients are treated by giving injections of insulin as these patients suffer from deficiency of insulin in their body.

41. Compare the nervous system and endocrine system (hormonal system) for control and coordination in humans.

Nervous system	Endocrine system
----------------	------------------

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The nervous system is built by neurons.

Electrical impulses carry messages.

The path of transmission of messages is the long fiber nerves.

Endocrine system is built by secretory cells called glands.

Chemicals called hormones carry messages.

The path of transmission of messages is the main bloodstream.

42. State the functions of the following hormones:

(a) Thyroxine

(b) Adrenaline

(c) Growth hormone

Answer

(a) Thyroxine: Controls the rate of metabolism of carbohydrates, fats and proteins in the body.

(b) Adrenaline: Regulates the heartbeat, breathing rate, blood pressure and carbohydrate metabolism.

(c) Growth hormone: Controls the development of bones and muscles.

43. Write the names of all the major endocrine glands present in the human body. Which of these glands also function as exocrine glands?

Answer

The major endocrine glands present in the human body are:

- Pineal gland
- Hypothalamus gland
- Pituitary gland
- Thyroid gland
- Parathyroid glands
- Thymus
- Pancreas
- Adrenal glands

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- Testes in males and ovaries in females Pancreas, testes, and ovary also function as exocrine glands.

44. Match the hormones given in column I with their functions given in column II:

Hormones	Functions
(i) Thyroxine	(a) Causes breasts to develop in females
(ii) Adrenaline	(b) Causes the male to start producing sperms
(iii) Insulin	(c) Prepares the body for an emergency
(iv) Estrogen	(d) Controls the metabolic rate
(v) Testosterone	(e) Regulates the amount of sugar in blood

Answer

(i) Thyroxine – controls the metabolic rate

(ii) Adrenaline – Prepares the body for an emergency

(iii) Insulin – Regulates the amount of sugar in blood

(iv) Estrogen – causes breasts to develop in females

(v) Testosterone – Causes the males to start producing sperms

45. A person walks across a room in bare feet and puts his foot on a drawing pin lying on the floor. He lets out a cry. Explain what happens in his nervous system in bringing about this response.

Answer

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The action performed by the person is reflex action. The person feels the pain in the foot and hence withdraws his foot from the pin. Foot acts as receptor and pain acts as stimulus. The neurons transmit the message sent from the impulse to sensory organ and the message is transmitted to spinal cord. Then the impulse is passed to a relay neuron which, in turn, passes it to a motor neuron. The motor neuron passes the impulse to the muscle in the foot. The muscle, then, contracts and pulls the foot away from the drawing pin.

46. In what ways are puberty and adolescence result of the activity of some glands in the human body?

Answer

Puberty and adolescence are results of the activities of testosterone in males and oestrogen in females. In males during puberty, testosterone secretion is increased resulting in the development of male sex organs and male characters such as deeper voice, moustache, beard and more body hair.

In females, oestrogen secretion is increased at the time of puberty resulting in the development of female sex organs and female characters such as feminine voice, soft skin and mammary glands.

47. List three ways in which neurons are similar to other cells.

Answer

Neurons are similar to other cells in the following ways:

(a) Cytoplasm is present in both cells

(b) Nuclei is present in both cells

(c) Cell membranes are bounded in both cells

48. Explain the difference between each of the following pairs of terms :

(a) receptor and effector

(b) cerebrum and cerebellum

(a) Receptor: Cell or group of cells, which are responsive to particular stimuli like sound, smell, heat etc. Example: Skin has heat receptors etc.

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Effector: It is part of body which is responsive to stimulus as per the instructions given by nervous system. Example: Muscles, glands etc.

(b) Cerebrum: It is the part of fore brain. It helps in development of logical skills like learning, reasoning, intelligence etc.

Cerebellum: It is the part of hind brain. It helps in maintaining the posture and balance of the body.

49. What is the difference between a voluntary and an involuntary action? Which kind of action is digestion? Explain your choice.

Answer

Voluntary action is under the person's control and involuntary action is not under the person's control.

Digestion is an involuntary action because it occurs inside our body without our choice.

50. What does CNS stand for? Which part of CNS: (a) consists of two cerebral hemispheres, and (b) has spinal nerves attached to it?

Answer

CNS stands for Central Nervous System.

(a) Cerebrum

(b) Spinal cord

51. Which hormone:

(a) prepares the body for action?

(b) Controls the amount of glucose in blood?

(c) Gives boys a deep voice?

(d) Gives girls soft skin?

Answer

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(a) Adrenaline

(b) Insulin

(c) Testosterone

(d) Oestrogen

52. When you smell a favourite food your mouth begins to water (that is, you secrete saliva). Write down what the following are examples of:

(a) the smell of the food

(b) the cells in your nasal passages which perceive the smell

(c) the gland which is stimulated to secrete saliva.

Answer

(a) Stimulus.

(b) Olfactory receptors

(c) Salivary gland

Long Answer Type Questions

53. (a) Name the structural and functional unit of the nervous system.

(b) Draw a flow chart to show the classification of the nervous system into various parts.

(c) What is the autonomic nervous system? What is its function?

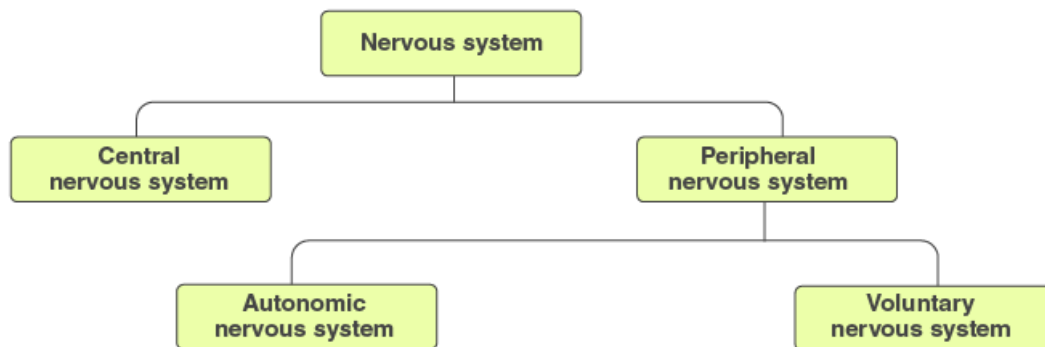
(d) What is voluntary nervous system? Explain the working of the voluntary nervous system with an example.

Answer

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(a) Neuron is the structural and functional unit of the nervous system.

(b) Classification of the nervous system into various parts:



(c) The autonomic nervous system is the part of the nervous system. It regulates the functions of the internal organs of the body. The vital function is to control and regulate involuntary actions like heartbeat, blood flow, breathing and digestion.

(d) Voluntary nervous system is the part of the nervous system that is responsible for carrying motor and sensory information both to and from the central nervous system (CNS). It is associated with voluntary control of body movements through the actions of skeletal muscles. It is also responsible for sensing external stimuli, which helps the body to remain in touch with its surroundings. The nerve impulses are generated in the sensory nerves and conducted to the brain. The brain sends instructions to the skeletal muscles (effector muscle) through the motor nerves to remove the pin. Then the muscle acts accordingly and removes the pin.

54. (a) What is a reflex action? Explain with the help of an example.

(b) Define reflex arc. Give the flow chart of a spinal reflex arc.

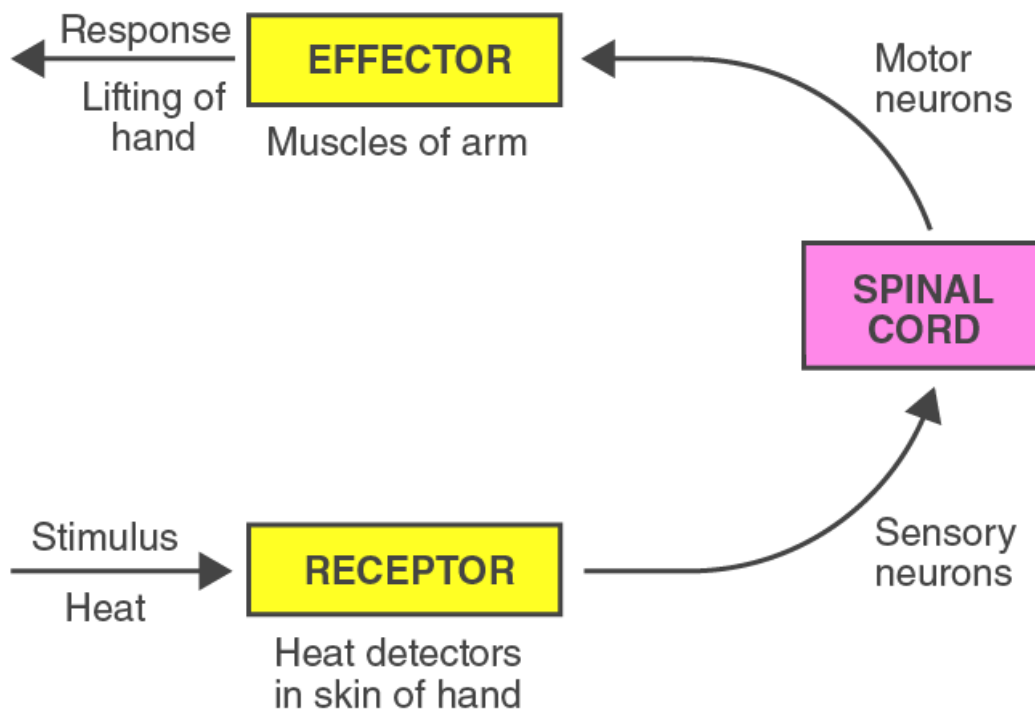
(c) How are involuntary actions and reflex actions different from each other?

Answer

(a) Reflex action is an automatic response to a stimulus. It is not under the voluntary control of the brain. If we see an intense beam of light we automatically blink our eyes.

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(b) The path travelled by an impulse during a reflex action is called a reflex arc.



(c) The normal actions given by the internal or external organs of the body are the involuntary actions. The sudden involuntary actions given by external stimuli are the reflex actions.

55. (a) What is the function of our nervous system?

(b) What are the main organs of the human nervous system? Draw a labelled diagram to show the main organs of the human nervous system.

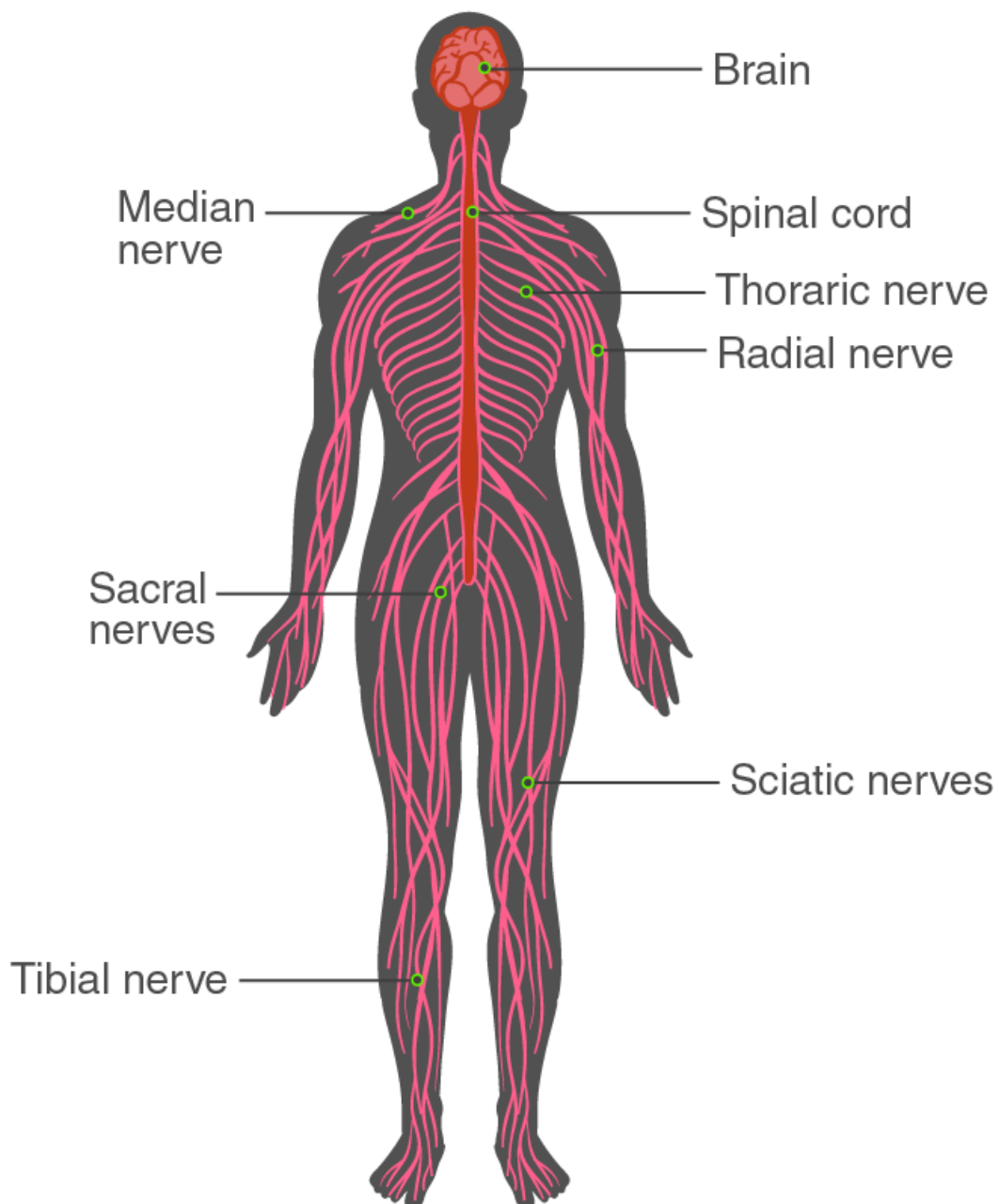
(c) How does the human nervous system work? Explain.

Answer

(a) The function of the nervous system is to coordinate the activities of our body. The nervous system regulates all the other systems of our body to work together.

(b) The main organs of the human nervous system are the brain, the spinal cord and the nerves.

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(c) Our body has five sense organs such as eyes, ears, nose, tongue, and skin. When these are affected a message is sent to brain via electrical impulse through the sensory organs. The brain does the specific action to be carried out. The motor neurons receives information from brain and the concerned muscles performs the action.

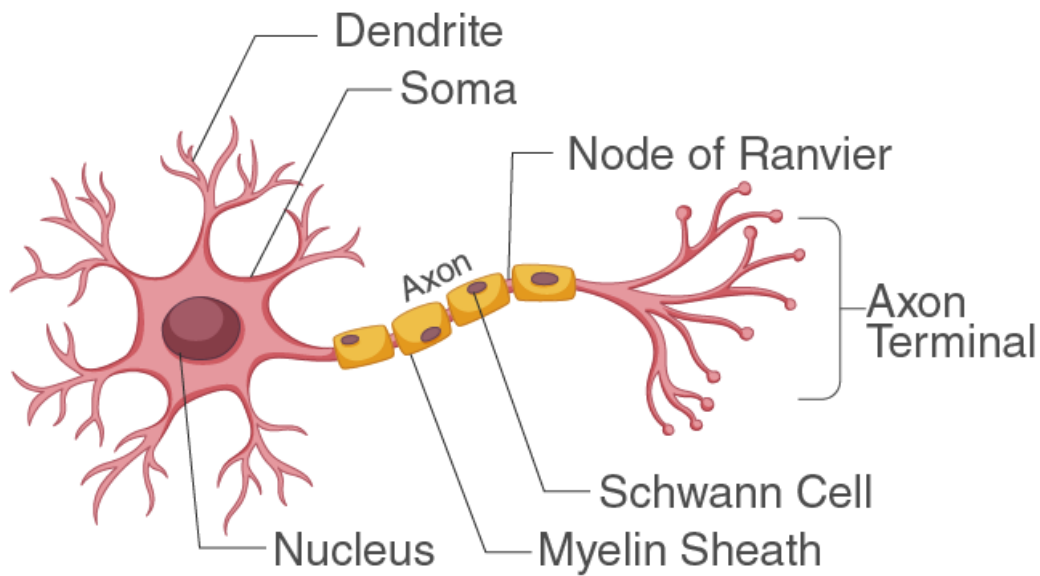
56. (a) What is a neuron? Draw a labelled diagram of a neuron.

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(b) What is a synapse? What happens at the synapse between two neurons? How are the messages carried across a synapse? Explain with the help of a labelled diagram.

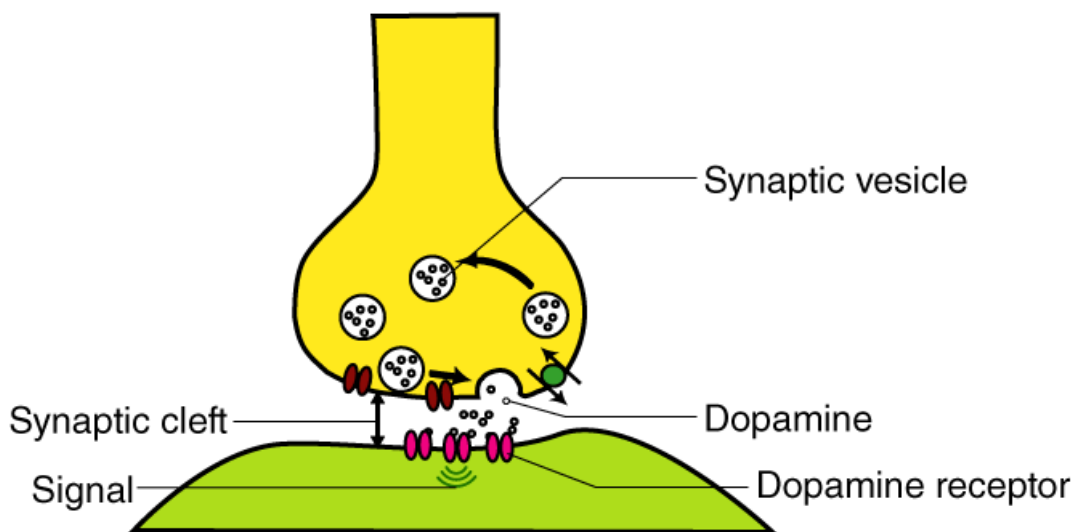
Answer

(a) Neuron is the structural and functional unit of the nervous system. Cell body, dendrites and axon are the components of neuron.



(b) Synapses are microscopic gaps present in between pairs of adjacent neurons over which nerve impulses pass from one neuron to the next. A stimulus acts an electrical impulse is sent from the sensory organ. The impulse travels from the dendrites of the sensory neuron (say A) to its cell body and, then, along its axon. The electrical impulse releases chemical substances called neurotransmitters into the synapse which cross the synapse and start a similar electrical impulse in the dendrites of the next neuron.

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57. (a) Name two systems which taken together perform the functions of control and coordination in human beings.

(b) What does the central nervous system in humans consist of? What is the job of the central nervous system?

(c) Give the various functions of brain.

Answer

(a) The nervous system and the endocrine system together perform the functions of control and coordination in human beings.

(b) The central nervous system consists of the brain and the spinal cord. It is responsible for the coordination and control of the activities of the nervous system. It directs incoming messages to the motor neurons, that will respond to a stimulus.

(c) The various functions of the brain are as follows:

- Receiving nerve impulse from all sensory organs of the body.
- Responding to the stimuli brought by sensory organs
- Coordinating the various stimuli from various sense organs

58. (a) Write the names of five endocrine glands found in the human body. Name the hormones secreted by each gland.

(b) How do hormones reach the organs they control?

(c) Name the gland which controls the secretion of hormones from the pituitary.

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(d) How does our body respond when adrenaline is secreted in large amounts into the blood?

(e) Name the disease which occurs in adults due to the deficiency of iodine in the diet. What is the main symptom of this disease?

Answer

(a) The five endocrine glands found in the human body are:

- Pituitary gland: secretes growth hormone.
- Thyroid gland: secretes thyroxine hormone.
- Parathyroid gland: secretes parathormone.
- Pancreas: secretes insulin.
- Adrenal glands: secrete adrenaline.

(b) Hormones reach the target organ through the blood and act on it.

(c) Hypothalamus regulates the secretion of hormones from the pituitary gland.

(d) An increase in the amount of adrenaline in our body increases our heart beat, breathing rate, blood flow into the muscles and causes the liver to put more stored glucose in our blood.

(e) Iodine deficiency in our diet causes goitre. The main symptom of goitre is swelling of the thyroid gland which is present in the neck.

Multiple Choice Questions

59. A cell (or group of cells) in a sense organ which is sensitive to a particular type of stimulus is called:

(a) interceptor

(b) effector

(c) receptor

(d) acceptor

Answer

(c) receptor

60. Which of the following cannot be considered a receptor?

(a) ear

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(b) nose

(c) muscle

(d) eye

Answer

(c) muscle

61. One of the following acts as an endocrine gland as well as an exocrine gland. This one is:

(a) salivary gland

(b) pancreas

(c) pituitary

(d) parathyroid

Answer

(b) pancreas

62. Which of the following helps in maintaining posture and balance of the human body?

(a) cerebellum

(b) cerebrum

(c) medulla

(d) pons

Answer

(a) Cerebellum

63. The number of pairs of nerves which arises from the spinal cord is:

(a) 21

(b) 31

(c) 41

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(d) 51

Answer

(b) 31

64. Cerebellum, medulla and pons are the parts of:

(a) mid-brain

(b) hind-brain

(c) forebrain

(d) spinal cord

Answer

(b) hindbrain

65. Which of the following are cerebral reflexes?

(i) a person pulls away his hand on touching a hot object

(ii) a person spits out immediately when a fly enters his mouth while talking

(iii) A person walking bare foot lifts his foot at once on stepping on to a nail

(iv) A person's pupil contracts at once in the presence of bright light

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (ii) and (iv)

Answer

(d) (ii) and (iv)

66. Iodine is necessary for the synthesis of which of the following hormone?

(a) Adrenaline

(b) auxin

(c) thyroxine

(d) insulin

Answer

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(c) Thyroxine

67. Which of the following is a mis-matched pair?

(a) Adrenaline: pituitary gland

(b) estrogen : ovary

(c) pancreas : insulin

(d) progesterone : ovary

Answer

(a) adrenaline: pituitary gland

68. One of the following is an incorrect statement about insulin. This is:

(a) it is produced in pancreas

(b) it regulates growth and development of the body

(c) it regulates blood glucose level in the blood

(d) its deficiency in the body will cause diabetes

Answer

(b) it regulates growth and development of the body

69. The spinal cord originates from:

(a) cerebrum

(b) cerebellum

(c) medulla

(d) pons

Answer

(c) medulla

70. The involuntary actions in the body are controlled by:

(a) medulla in forebrain

(b) medulla in hindbrain

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(c) medulla in spinal cord

(d) medulla in midbrain

Answer

(b) medulla in the hindbrain

Question 71:

71. Which of the following is not an involuntary action?

(a) vomiting

(b) chewing

(c) heart beat

(d) salivation

Answer

(b) chewing

72. Which of the following hormone prepares our body for action in emergency situations?

(a) testosterone

(b) growth hormone

(c) adrenaline

(d) insulin

Answer

(c) adrenaline

73. One of the following controls the peristaltic movements of alimentary canal. This one is:

(a) cerebrum

(b) cerebellum

(c) pons

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(d) medulla

Answer

(d) medulla

74. The hormone which is associated with male puberty is called:

(a) oestrogen

(b) adrenaline

(c) testosterone

(d) progesterone

Answer

(c) testosterone

Question 75:

75. Which of the following endocrine gland does not occur as a pair in the human body?

(a) adrenal

(b) pituitary

(c) testis

(d) ovary

Answer

(b) Pituitary

76. The junction between two adjacent neurons is called:

(a) nerve junction

(b) sensory junction

(c) synapse

(d) neuro-muscular joint

Answer

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(c) synapse

77. The life processes in humans are controlled and regulated by:

(a) reproductive and endocrine systems

(b) respiratory and nervous systems

(c) endocrine and digestive systems

(d) nervous and endocrine systems

Answer

(d) nervous and endocrine systems

78. A doctor advised a person to take injection of insulin because:

(a) his blood pressure was high

(b) his heart beat was high

(c) his blood sugar was high

(d) his thyroxine level in blood was high

Answer

(c) his blood sugar was high.

79. All the voluntary actions of our body are controlled by:

(a) cerebrum

(b) cerebellum

(c) pons

(d) medulla

Answer

(a) cerebrum

80. One of the following statements is not true about thyroxine. This is :

(a) Thyroid gland requires iron to synthesise thyroxine

(b) It regulates carbohydrate, protein and fat metabolism

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(c) Iodine is essential for the synthesis of thyroxine

(d) Thyroid gland can enlarge due to lack of thyroxine

Answer

(a) thyroid gland requires iron to synthesise thyroxine.

81. Which of the following does not act as an endocrine gland as well as an exocrine gland?

(a) testis

(b) ovary

(c) pituitary

(d) pancreas

Answer

(c) Pituitary

82. The part of brain which controls the involuntary action such as heart beat, breathing, blood pressure, etc is:

(a) pons

(b) medulla

(c) cerebrum

(d) cerebellum

Answer

(b) medulla

83. Dwarfism results due to:

(a) excessive secretion of thyroxine hormone

(b) excessive secretion of growth hormone

(c) less secretion of adrenaline hormone

(d) less secretion of growth hormone

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Answer

(d) less secretion of growth hormone

84. The dramatic changes in body features associated with puberty are mainly because of the secretions of:

(a) estrogen from testes and testosterone from ovary

(b) estrogen from adrenal gland and testosterone from pituitary gland

(c) testosterone from testes and estrogen from ovary

(d) testosterone from thyroid gland and estrogen from pituitary gland

Answer

(c) testosterone from the testes and estrogen from the ovary

85. Which of the following statements is correct about receptors?

(a) gustatory receptors detect taste while olfactory receptors detect smell

(b) both gustatory and olfactory receptors detect smell

(c) auditory receptors detect smell and olfactory receptors detect taste

(d) olfactory receptors detect taste and gustatory receptors detect smell

Answer

(a) gustatory receptors detect taste, while olfactory receptors detect smell

86. The part of brain which takes part in regulating respiration in the human body is:

(a) medulla

(b) pons

(c) cerebellum

(d) cerebrum

Answer

(b) the pons

87. Electrical impulse travels in a neuron from :

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- (a) dendrite → axon → axon end → cell body
- (b) cell body → dendrite → axon → axon end
- (c) dendrite → cell body → axon → axon end
- (d) axon end → axon → cell body → dendrite

Answer

- (c) dendrite → cell body → axon → axon end

88. In a synapse, chemical signal is transmitted from :

- (a) axon to cell body of the same neuron
- (b) cell body to axon end of the same neuron
- (c) dendrite end of one neuron to axon end of adjacent neuron
- (d) axon end of one neuron to dendrite end of adjacent neuron

Answer

- (d) axon end of one neuron to the dendrite end of the adjacent neuron.

89. In a neuron, the conversion of electrical signal to a chemical signal occurs at/in :

- (a) dendrite end
- (b) cell body
- (c) axon end
- (d) myelin sheath

Answer

- (c) axon end

90. One of the following gives the correct sequence of the components in a reflex arc. This is :

- (a) Receptors → Muscle → Sensory neuron → Motor neuron → Spinal cord
- (b) Receptors → Motor neuron → Spinal cord → Sensory neuron → Muscle
- (c) Receptors → Spinal cord → Sensory neuron → Motor neuron → Muscle

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(d) Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Answer

(d) Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

91. Which of the following statements are true?

(i) sudden action in response to something in the environment is called reflex action

(ii) sensory neurons carry electrical signals from spinal cord to muscles in a reflex action

(iii) motor neurons carry signals from receptors to spinal cord in a reflex action

(iv) the pathway of transmitting signals from a receptor to a muscle is a reflex action

(a) (i) and (ii)

(b) (i) and (iii)

(c) (i) and (iv)

(d) (i), (ii) and (iii)

Answer

(c) (i) and (iv)

92. The gustatory receptors of our body are in one of the following organs. This organ is:

(a) ear

(b) nose

(c) tongue

(d) skin

Answer

(c) tongue

93. The olfactory receptors in humans are located in:

(a) eyes

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(b) tongue

(c) ears

(d) nose

Answer

(d) nose

94. The contraction of pupil of the eye in the presence of bright light is an example of:

(a) Voluntary reflex

(b) Spinal reflex

(c) Cerebral reflex

(d) Adrenal reflex

Answer

(c) Cerebral reflex

95. The faulty functioning of an endocrine gland can make a person very short or very tall. This gland is:

(a) thyroid

(b) pineal

(c) adrenal

(d) pituitary

Answer

(d) pituitary

96. The underactive endocrine gland which causes goitre is:

(a) pancreas

(b) thyroid

(c) adrenal

(d) pituitary

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Answer

(b) thyroid

97. The endocrine gland whose malfunctioning causes diabetes disease is:

(a) pituitary

(b) pineal

(c) parathyroid

(d) pancreas

Answer

(d) pancreas

98. The use of iodized salt is recommended to prevent:

(a) diabetes

(b) gonorrhea

(c) dysentery

(d) goitre

Answer

(d) goitre

99. Which of the following are often called glands of emergency?

(a) thyroid

(b) pituitary

(c) adrenal

(d) pancreas

Answer

(c) adrenal

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