2. Control and Coordination

Very Short Answer Type Questions-Pg-92

1. Question

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

Answer

Phytohormones or plant hormones are the organic substances produced naturally in plants which control growth and other physiological activities at a site away from their synthesis.

2. Question

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

Answer

Abscisic acid, produced in the roots and terminal buds of the plant, is involved in many developmental plant processes, including leaf abscission, responding to environmental stress, and inhibiting fruit ripening.

3. Question

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

Answer

Auxin, a phytohormone produced in the stem and bud tips, promotes cell elongation. Auxins promote cell stem elongation and inhibit growth of lateral buds. They promote bending of stems or shoot towards light (also known as phototropism).

4. Question

Where is the auxin hormone made in a plant stem?

Answer

Auxin phytohormone is produced in the stem, buds, and root tips.

5. Question

What is the scientific name of sensitive plant?

Answer

Touch me not (also known is Chui-mui) is a touch sensitive plant. The scientific name of this plant is *Mimosa pudica*.

6. Question

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

Answer

Gibberellins are growth *hormones* that stimulate cell elongation and cause plants to grow taller.

Abscisic acid involves in many developmental plant processes, including leaf abscission, inhibiting plant growth and fruit ripening.

7. Question

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

Answer

When we touch the leaves of *Mimosa pudica* (touch me not) then they get folded. It is a rapid process.

8. Question

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

Answer

Phytohormones or plant hormones are the organic substances produced naturally in plants which control growth and other physiological activities.

9. Question

What is the stimulus in:

(a) phototropism?

(b) geotropism?

(c) chemotropism?

(d) hydrotropism?

(e) thigmotropism?

Answer

(a) Light is the stimulus in phototropism.

(b) Gravity is the stimulus in geotropism.

(c) Chemical is the stimulus in chemotropism.

(d) Water is the stimulus in hydrotropism.

(e) Touch is the stimulus in thigmotropism.

10. Question

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) The process of bending of a shoot towards light is known as phototropism.

(b) The process of growing of roots towards the earth is known as geotropism.

(c) The process of growth of a pollen tube towards ovule is known as chemotropism.

(d) The process of bending of roots towards water is known as hydrotropism.

(e) The process of winding of tendril around a support is known as thigmotropism.

11. Question

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

Answer

When we touch the leaves of a sensitive plant like touch-me not (chui-mui) then they get folded up. It shows an example of the movement of leaves which is caused by the loss of water.

12. Question

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) Root of a plant bends towards the water in soil hence shows positive hydrotropic with positive geotropic.

(b) Stem of a plant bend towards the light above the soil hence shows positive phototropic but negative geotropic.

13. Question

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

(a) Folding up of leaves of sensitive plant on touching with hand is not a growth movement.

(b) Folding up of petals of dandelion flower when light fades is a growth movement.

14. Question

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

Answer

(a) Root of a plant bends in the direction of gravity but away from light.

(b) Shoot or stem of a plant bends towards light but away from the force of gravity.

15. Question

To which directional stimuli do:

(a) roots respond?

(b) shoots respond?

Answer

(a) Roots respond to light, gravity and water stimuli.

(b) Roots respond to light and gravity.

16. Question

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 ……

(j) 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 sunlight.

(d) Plant roots grow downward in response to gravity.

(e) Tendrils wind around a support in response to touch.

(j) Plant roots grow towards water and in the direction of force of gravity.

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

(h) Auxin is the hormone that causes phototropism in plants.

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

Short Answer Type Questions-Pg-93

17. Question

Plant parts show two types of movements, one dependent on growth and the 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 is the growth of plant parts in the direction of its light source. The bending of stem or shoot towards light shows this process.

(b) Touch me not (also known is Chui-mui) is a touch sensitive plant. When we touch the leaves of this plant then they get folded.

18. Question

What is a plant hormone? Name four plant hormones. State one function of each. ***(CBSE 2015)***

Answer

Plant hormones (also known as phytohormones) are chemicals that regulate plant growth.

4 Plant hormones:(a) Auxins: Influence cell enlargement, bud formation and root initiation. Also promotes apical dominance.

(b) Cytokinins: Influence cell division and shoot formation.

(c) Gibberellins: Stimulate cell elongation and initiate mobilization of storage materials in seeds during germination.

(d) Ethylene: Stimulates the ripening of fruit and initiates abscission of fruits and leaves.

19 A. Question

What does a root do in response to gravity? What is this phenomenon known as?

Answer

Positive geotropism is the process in which the roots of plants bend downwards in the direction of gravity.

19 B. Question

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

Answer

Positive phototropism is the process in which stem or shoot of plants bends towards the light.

20 A. Question

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

Answer

Negative geotropism is the process in which stem or shoot of plants grows upward against the direction of gravity.

(b) Negative phototropism is the process in which roots of plants bend away from light.

20 B. Question

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

Answer

Negative phototropism is the process in which roots of plants bend away from light.

21 A. Question

What does a *Mimosa pudica* plant do in response to touch? What is this phenomenon known as?

Answer

When we touch the leaves of *Mimosa pudica* (also known as touch-me not or chui-mui plant), they get folded up. This phenomenon of folding up of leaves is known as thigmonasty.

21 B. Question

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

Answer

(i) In the morning, a dandelion flower opens up in bright light. This phenomenon is known is positive photonasty.

(ii) A dandelion flower closes at night. This phenomenon is known as negative photonasty.

22. Question

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

Answer

The roots of a plant grow towards the water. This phenomenon is known as hydrotropism.

22 B. Question

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

Answer

(i) The petals of moon flower get closed during the daytime because of bright light.

(ii) The petals of moon flower get opened at night because of dark. This phenomenon is known as photonasty.

23. Question

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

Answer

A tendril is a specialized leaf, petiole or stem with a threadlike shape. It is used by climbing plants for support and attachment. The tendrils grow towards the things they happen to touch and the phenomenon is known as thigmotropism.

24. Question

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

Answer

The five types of tropisms are:

(a) Phototropism

(b) Chemotropism

(c) Geotropism

(d) Thigmotropism

(e) Hydrotropism

The different types of tropic movements help the plant to grow and survive. Roots grow in soil towards gravity show the geotropism.

25. Question

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

Answer

Due to chemical stimulus, the growth of a plant part is known as chemotropism. For example, a sugary substance can induce to the growth of pollen tube towards the ovule. Here, sugary substance works as a stimulus and this process represents the positive chemotropism.

26. Question

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

Answer

Tropic movements are very slow and always in the direction of stimulus. All parts of a plant (roots, stem and leaves etc.) exhibit these movements. Movement of shoot towards the light and not towards gravity is an example of this kind of movement.

Nastic movements are rapid and neither away nor towards the stimulus. Leaves and petals of flower exhibit these movements. The bending and drooping of leaves in 'Touch-me-not' plant is an example of this kind of movement.

27 A. Question

What is meant by nastic movements in plants? Give one example of nastic movements in plants.

Answer

Nastic movement is the movement of a plant part in response to an external stimulus. In this type of movement, the direction of response is not determined by the direction of stimulus. Leaves and petals of flower exhibit these movements. The bending and drooping of leaves in 'Touch-me-not' plant is an example of this kind of movement.

27 B. Question

What is the difference between photonasty and thigmonasty?

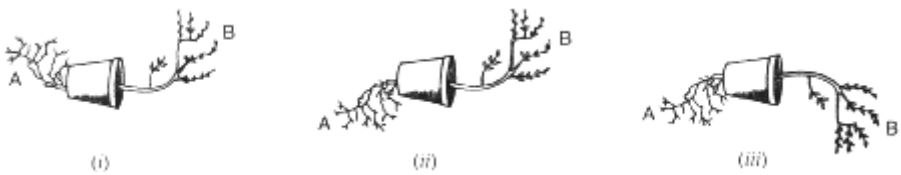
Answer

Photonasty: It is the non-directional movement of a plant part (e.g. petals of flowers) in response to light. The opening and closing of petals of dandelion flowers in response to light intensity is an example of this process.

Thigmonasty: It is the non-directional movement of a plant part in response to the touch. The folding up of *Mimosa pudica* leaves when touching is an example of this process.

28. Question

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:



(i) (ii) (iii)

(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?

Answer

(a) Figure (ii) shows the correct position taken by the parts A and B of the plant. As the aerial parts of the plants show positive phototropism while roots show positive geotropism.

(b) Geotropism is exhibited by the figure chosen in (A) above.

29. Question

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

(d) closing of stomata

Answer

(a) Abscisic acid is responsible for abscission of falling of leaves.

(b) Cytokinin is responsible for opening of stomata.

(c) Auxin is responsible for bending of stem towards light.

(d) Abscisic acid is responsible for closing of stomata.

30. Question

Name the plant organs which are:

(a) positively phototropic

(b) positively geotropic

(c) negatively geotropic

(d) positively hydrotropic

Answer

(a) Stem or shoot is positive phototropic (bends towards the light).

(b) Roots are positive geotropic (grow in the soil in the direction of gravity).

(c) Stem or shoot is negative geotropic (grows above the soil against the gravity).

(d) Root are positive hydrotropic (grow in the soil for water).

31. Question

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

Answer

When we touch the leaves of a sensitive plant (like *Mimosa pudica*), they get folded. It is not a case of tropism because there is no dependency of direction of leaves movement on the direction of stimulus (touch).

32. Question

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 (when it gets dark) is not an example of a tropism because there is no dependency of the direction of movement of petals of dandelion flower on the direction of stimulus (light).

Long Answer Type Questions-Pg-94

33 A. Question

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

Answer

Tropism is the turning or bending movement of a plant in a particular direction in response to an external stimulus such as gravity or light.

Example – The process that represents the bending of plant stem towards light is known as positive phototropism.

33 B. Question

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

Answer

Different types of tropisms are as follows:

(i) Phototropism – It is the movement of a plant part towards light. The light is the stimulus in this process.

(ii) Geotropism – It is the movement of a plant part towards gravity. The gravity is the stimulus in this process.

(iii) Chemotropism – It is the movement of a plant part in response to a chemical. A chemical is the stimulus in this process.

(iv) Hydrotropism – It is the movement of a plant part in response to water. The water is the stimulus in this process.

(v) Thigmotropism – It is the movement of a plant part in response to touch. Touch is the stimulus in this process.

33 C. Question

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

Answer

Tropisms: These kinds of movements are very slow and always in the direction of stimulus. All parts of a plant (roots, stem and leaves etc.) exhibit these movements.

Nasties: These kinds of movements are rapid and neither away nor towards the stimulus. Leaves and petals of flower exhibit these movements.

34 A. Question

Define phototropism. Give one example of phototropism.

Answer

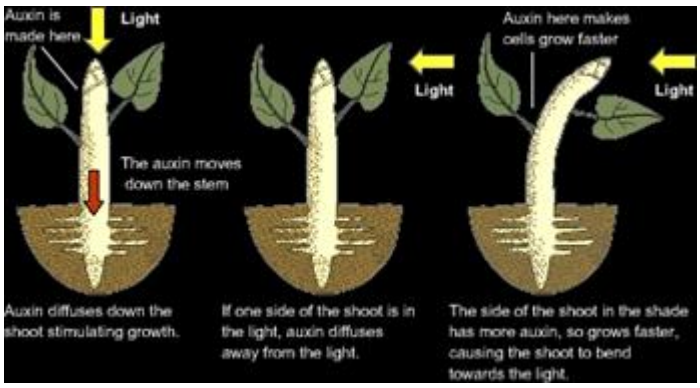
Phototropism is the movement of a plant part in response to a stimulus (light).

34 B. Question

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

Answer

Phototropism in a plant stem or shoot – The bending of a plant stem towards light represents the phototropism process. Due to the action of auxin, a growth hormone, the plants stem bends towards the light. This hormone is present at shoot tip of the growing plant. It usually prefers to stay in shade or away from sunlight so when the sunlight falls on the stem directly from one side then it gets concentrated on the other side. Due to presence of more auxin, the shady side of the stem or shoot grows longer in comparison to the side of stem which is facing direct sunlight hence, makes the stem bend towards light.



34 C. Question

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

Answer

Positive phototropism is the movement of a plant part in response to a stimulus (light). If the movement of a plant part away from light then it is known as negative phototropism. The stem of a plant grows and bends towards light represents the positive phototropism while movement of root away from light inside the soil is an example of negative phototropism.

35 A. Question

Define geotropism. Give one example of geotropism.

Answer

Geotropism is the movement of a plant part in response to a stimulus (gravity).

35 B. Question

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.

Answer

Positive geotropism is movement of a plant part towards the direction of gravity. For example, roots grow in the soil.

Negative geotropism is the movement of a plant part against the direction of gravity. For example, Stem or shoot grow outside the soil.

35 C. Question

Name one plant part which exhibits positive thigmotropism.

Answer

A tendril is a specialized leaf, petiole or stem with a threadlike shape. It is used by climbing plants for support and attachment. The tendrils grow towards the things they happen to touch and the phenomenon is known as thigmotropism.

36 A. Question

How does control and coordination take place in plants? How does it differ from that in animals?

Answer

Like humans and other animals, plants do not have a well-defined nervous system but they can sense things in their surroundings in the presence of various stimuli like light, gravity, water, touch etc. and respond them by different hormonal actions. The plants coordinate their behavior against environmental behavior by these hormones. This process is called coordination. These hormones are organic chemicals and play a vital role in different plant parts that results the movement of plant part in response to a stimulus. In animals, the control and coordination takes place in coordination of both nervous system and hormones.

36 B. Question

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

Answer

(i) Light is the stimulus in phototropism.

(ii) Gravity is the stimulus in geotropism.

(iii) Touch is the stimulus in thigmotropism.

(iv) Water is the stimulus in hydrotropism.

(v) Chemical is the stimulus in chemotropism.

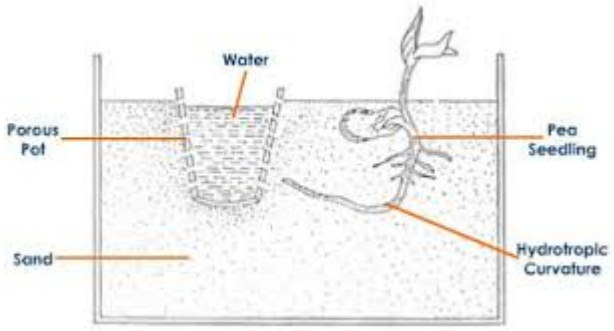
36 C. Question

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 labeled diagram.

Answer

Hydrotropism is the movement of a plant part in response to a stimulus (water).

Example: The plant roots always move towards water hence shows positive hydrotropism.



37 A. Question

What is meant by positive tropism and negative tropism? Explain with examples.

Answer

Positive tropism is the growth of a plant part in response to a stimulus while negative tropism is the growth of a plant part is away from the stimulus.

Example: The roots of a plant grow towards gravity in soil represent the positive geotropism whereas stem of same plant grows against the gravity and represent the negative geotropism.

37 B. Question

Define thigmotropism. Give one example of thigmotropism.

Answer

Thigmotropism is the directional growth movement of a plant part in response to the stimuli (touch). Example: A tendril is a specialized leaf, petiole or stem with a threadlike shape. It is used by climbing plants for support and attachment. The tendrils grow towards the things they happen to touch.

37 C. Question

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

Thigmotropism is the directional growth movement of a plant part in response to the stimuli (touch). Example - Tendrils

Thigmonasty is non-directional movement of a plant part in response to the stimuli (touch). Example – Mimosa pudica (Touch me not or Chui-mui plant)

Tendrils grow towards a stimulus (touch) and show directional movement and represent thigmotropism. In case of thigmonasty, the folding of leaves in *Mimosa pudica* (Touch me not or Chui-mui plant) is not depend on the direction of stimulus.

Multiple Choice Questions (MCQs)-Pg-94

38. Question

Which of the following is not a plant hormone?

A. auxin

B. ascorbic acid

C. cytokinin

D. abscisic acid

Answer

Ascorbic acid, also known as Vitamin C, is a vitamin found in food particularly in citrus fruits and green vegetables.

39. Question

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

Auxin, which is present at the tip of shoot, is responsible for the phenomenon of phototropism in plants.

40. Question

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

A. hydrotropism

B. geotropism

C. chemotropism

D. phototropism

Answer

Geotropism is the movement of a plant part in response to a stimulus (gravity).

41. Question

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

A. photonasty

B. phototropism

C. hydrotropism

D. chemotropism

Answer

Phototropism is the movement of a plant part in response to a stimulus (light). Hence, the movement of sunflower in accordance with the path of the sun is due to phototropism.

42. Question

The plant part which exhibits negative geotropism is:

A. root

B. stem

C. branch

D. leaves

Answer

Negative geotropism is the movement of a plant part against the direction of gravity. For example, Stem or shoot grow outside the soil.

43. Question

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

C. gravity and water

D. light and gravity

Answer

The roots show positive geotropism and stem or other aerial parts of plants show negative geotropism. Its reverse, the roots show negative phototropism while other aerial parts show positive geotropism.

44. Question

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

Closing up of leaves of a sensitive plant on touching with an object (also known as Thigmonasty) is not caused by a growth movement.

45. Question

The root of a plant is:

Options -

(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

The root of plant grows in response to gravity inside the soil. Hence, it is positively geotropic but negatively phototropic.

46. Question

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

Abscisic acid is the growth inhibitor plant hormone.

47. Question

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

The growth of tendrils in pea plants is due to the rapid cell division and elongation in tendril cells that are away from the support.

48. Question

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

Abscisic acid is the growth inhibitor plant hormone.

49. Question

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

Abscisic acid, the growth inhibitor plant hormone, triggers the fall of mature leaves and fruits from the plant body.

50. Question

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

A. thigmotropism

B. chemotropism

C. hydrotropism

D. geotropism

Answer

Hydrotropism is the movement of a plant part in response to water. The water is the stimulus in this process.

51. Question

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

Due to chemical stimulus, the growth of a plant part is known as chemotropism. For example, a sugary substance can induce to the growth of pollen tube towards the ovule. Here, sugary substance works as a stimulus and this process represents the positive chemotropism.

52. Question

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

A. geotropism

B. phototropism

C. thigmotropism

D. photonasty

Answer

The process of bending of a shoot towards light is known as phototropism.

53. Question

The stimulus in the process of thigmotropism is:

A. touch

B. gravity

C. light

D. chemical

Answer

Thigmotropism is the movement of a plant part in response to touch. Touch is the stimulus in this process.

54. Question

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

The process of bending of a shoot towards light is known as phototropism.

55. Question

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

Hydrogen oxide (OH) acts as a stimulus in the process of hydrotropism.

56. Question

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

Thigmotropism is the movement of a plant part in response to touch of an object. Touch is the stimulus in this process.

57. Question

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

The process of winding of tendril around a support is known as thigmotropism.

58. Question

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

Auxin has adverse effect on growth rate of roots hence, it decrease the growth rate of roots.

59. Question

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

Thigmonasty is the non-directional movement of a plant part in response to the touch. The folding up of *Mimosa pudica* (touch me not or chui-mui) leaves when touching is an example of this process.

60. Question

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

Photonasty is the non-directional movement of a plant part (e.g. petals of flowers) in response to light. The opening and closing of petals of dandelion flowers in response to light intensity is an example of this process.

61. Question

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

A. moisture

B. candle light

C. touch

D. gravity

Answer

Touch is a directional stimulus roots of a plant do not respond.

62. Question

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

Thigmonasty is the non-directional movement of a plant part in response to the touch. The folding up of *Mimosa pudica* leaves when touching is an example of this process.

63. Question

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

A. cytokinin

B. gibberellin

C. abscisic acid

D. auxin

Answer

Auxin is the hormone that causes phototropism in plants.

64. Question

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

Abscisic acid is the growth inhibitor plant hormone.

65. Question

The movement of a shoot towards light is:

A. geotropism

B. hydrotropism

C. chemotropism

D. phototropism

Answer

The process of bending of a shoot towards light is known as phototropism.

66. Question

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

D. cytokinin

Answer

Auxin is the phytohormone which is responsible for the bending of the stem of a plant towards a source of light. This hormone is present at shoot tip.

67. Question

Which of the following plant part exhibits negative phototropism?

A. root

B. branch

C. leaves

D. stem

Answer

Negative phototropism is the process in which roots of plants bend away from light.

68. Question

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

Folding up of leaves of sensitive plant in response to touch is known as photonasty which is not a type of tropism. Opening up of the leaves of a daisy flower in response to light is also not an example of tropism.

Questions Based on High Order Thinking Skills (HOTS)-Pg-96

69. Question

The chemical substance P is made and secreted by the meristematic tissue at the tip of stem (or shoot) of a plant. The chemical substance P is responsible for a phenomenon Q in plants in which the stem bends towards a source of light. The same chemical substance P has an opposite effect on the root of a plant. It causes the root of a plant to bend away from the source of light in a process called R.

(a) What is the chemical substance P?

(b) State whether P prefers to remains in the sunlight side of a stem or in shade.

(c) What is the effect of substance P on the rate of growth of (i) a root, and (ii) a stem?

(d) What is the name of process (i) Q, and (ii) R?

(e) What is the general name of chemical substances like P? Name another substance which belongs to this class of chemical substances.

Answer

(a) From the given question, the chemical substance P is Auxin which is produced at the shoot tip and can diffuse to other plant parts.

(b) Auxin moves to the darker side of the plant, causing the cells there to grow large.

(c) Auxin has adverse effect on growth rate of roots hence, it decrease the growth rate of roots. Unlike roots, the auxin has positive effect on growth rate of stem hence, it increases the growth rate of stem.

(d) Process Q is positive phototropism while process E is negative phototropism. Growth towards a light source is called positive phototropism, while growth away from light is called negative phototropism.

(e) Chemical substance like P is Auxin, a Phytohormone or plant hormone. Like Auxin, Gibberellin is also an example of phytohormone.

70. Question

A potted plant is growing in a transparent glass jar. In this plant, X and Y are the two growing parts having a lot of meristematic tissue. It is observed that the part X of this plant exhibits positive geotropism but negative phototropism. On the other hand, part Y of this plant exhibits negative geotropism but positive phototropism.

(a) Name the part X of plant.

(b) Name the part Y of plant.

(c) Which part of the plant, X or Y, will exhibit positive hydrotropism?

(d) Which part of the plant, X or Y, can have tendrils on it?

Answer

(a) Roots show positive geotropism and grow in the direction of gravity. In soil, they grow towards dark hence, show negative phototropism.

(b) Stem or shoot shows positive phototropism and grows towards the light. They grow in opposite direction of gravity hence, show negative geotropism.

(c) The plant roots (Part X) always move towards water hence shows positive hydrotropism.

(d) Tendrils grow towards a stimulus (touch) and show directional movement and represent thigmotropism. Stem (Part Y) can have tendrils on it.

71. Question

There are three plants A, B and C. The flowers of plant A open their petals in bright light during the day but close them when it gets dark at night. On the other hand, the flowers of plant B open their petals at night but close them during the day when there is bright light. The leaves of plant C fold up and droop when touched with fingers or any other solid object.

(a) Name the phenomenon shown by the flowers of (i) plant A, and (ii) plant B.

(b) Name one flower each which behaves like the flower of (i) plant A, and (ii) plant B.

(c) Name the phenomenon exhibited by the leaves of plant C.

(d) Name a plant whose leaves behave like those of plant C.

(e) Which plant/plants exhibit the phenomenon based on growth movements?

Answer

(a) (i) Plant A shows positive photonasty.

(ii) Plant B shows negative photonasty.

(b) (i) In the morning, a dandelion flower opens up its petals in bright light. This phenomenon is known is positive photonasty.

(ii) A Moonflower flower closes its petals at night. This phenomenon is known as negative photonasty.

(c) Thigmonasty is the non-directional movement of a plant part in response to the touch. The folding up of leaves of plant C when touching is an example of this process.

(d) The folding up of *Mimosa pudica* leaves when touching is an example of Thigmonasty process.

(e) Plant A and B exhibit the phenomenon based on growth movements.

72. Question

While conducting experiments to study the effect of various stimuli on the plants, it was observed that the roots of a plant X grow and bend towards two stimuli A and B but bend away from a third stimulus C. The stem of the plant X, however, bends away from stimuli A and B but bends towards the stimulus C. The stimulus B is known to act on the roots due to too much weight of the earth. Keeping these points in mind, answer the following questions:

(a) What could stimulus A be?

(b) Name the stimulus B.

(c) What could stimulus C be?

(d) The branches of a fallen tree in a forest grow straight up in response to two stimuli. What could be these two stimuli out of A, B and C? Also name these two stimuli.

Answer

(a) Stimulus A could be water as roots show the positive hydrotropism.

(b) Stimulus B could be gravity as roots show the positive geotropism.

(c) Stimulus C could be light as roots show the negative phototropism.

(d) The two stimuli could be B (gravity) and C (light).

73. Question

P and Q are two types of plants having weak stems which cannot stand upright on their own. The plants P and Q have organs R and S respectively which can grow towards any support which they happen to touch and wind around that support. It is- observed that organ R originates from the leaves of the plant whereas organ S originates directly from the stem of the plant.

(a) What is (i) R, and (ii) S?

(b) What is the name of growth movement exhibited by the organs R and S?

(c) Name the stimulus involved in this case.

(d) State whether the behaviour of organs R and S is a tropic movement or a nastic movement.

(e) Name one plant like P and another plant like Q.

Answer

(a) (i) R is a leaf tendril.

(ii) S is a stem tendril.

(b) A tendril is a specialized leaf, petiole or stem with a threadlike shape. It is used by climbing plants for support and attachment. The tendrils grow towards the things they happen to touch and the phenomenon is known as thigmotropism.

(c) Touch (support) is the stimulus involved in this case.

(d) behaviour of organs R and S is a tropic movement. Tropic movement is always in the direction of stimulus. All parts of a plant (roots, stem and leaves etc.) exhibit tropic movements.

(e) Pea plant is like P (leaf tendrils) and bitter gourd plant is like Q (stem tendrils).

74. Question

The top part A of the flask-shaped reproductive organ X in the flower of a plant secretes a surgery substance into its lower part B which goes towards the bottom part C of the flask-shaped organ. When a tiny grain D coming from the top part E of another reproductive organ Y in the flower falls on part A, it grows a long tube F through the organ X in response to the sugary substance and reaches the bottom part C of flask **?** shaped organ to carry out fertilisation.

(a) What is (i) organ X, and (ii) organ Y, inside the flower?

(b) Name parts (i) A (ii) B, and (iii) C, of flask-shaped organ.

(c) Name (i) grain D, and (ii) part E of organ Y.

(d) Name the tube F.

(e) What is the phenomenon of growing a long tube in response to a sugary substance in the process of fertilization in a flower known as?

Answer

(a) (i) Inside the flower, the organ X is carpel (a female reproductive organ).

(ii) Inside the flower, the organ Y is stamen (a male reproductive organ).

(b) (i) Part A of flask shaped organ is stigma.

(ii) Part B of flask shaped organ is style.

(iii) Part C of flask shaped organ is ovary.

(c) (i) Grain D of organ Y (stamen) is pollen grain.

(ii) Part E of organ Y (stamen) is anther.

(d) Tube F is the pollen tube.

(e) Due to chemical stimulus, the growth of a plant part is known as chemotropism. For example, a sugary substance can induce to the growth of pollen tube towards the ovule. Here, sugary substance works as a stimulus and this process represents the positive chemotropism.

75. Question

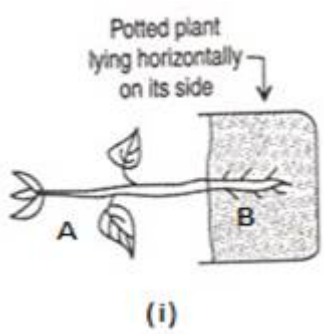
P, Q, R and S are four major types of phytohormones. P is a phytohormone which functions mainly as a growth inhibitor. It promotes the wilting and falling of leaves. Q, R and S are phytohormones which all promote growth of plants in various ways. Q is responsible for the phenomenon of phototropism in plants. R is involved mainly in shoot extensions. The phytohormone S helps in breaking the dormancy of seeds and buds. What are P, Q, R and S? Give one reason each for your choice.

Answer

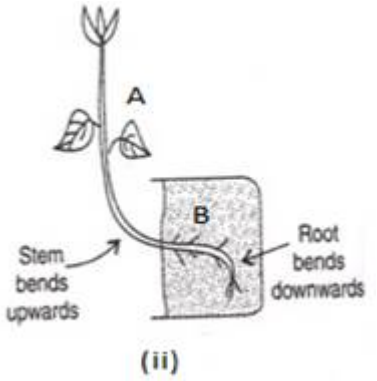
P is abscisic acid (a plant growth inhibitor hormone) and is responsible for the wilting and falling of leaves. Q is auxin which is responsible for the phenomenon of phototropism in plants as it is present at shoot tip. R is gibberellin which is responsible for enlargement of shoot. S is cytokinin which is responsible for breaking the dormancy of seeds and buds.

76. Question

A potted plant having straight parts A and B was placed horizontally on its side as shown in Figure (i). After a few days it was observed that the parts A and B of the plant acquire new positions as shown:



(i)



(a) Name the phenomenon exhibited by the position of plant parts A and B in Figure (ii)

(b) Name the stimulus (other than sunlight) which causes plant part A to grow and bend upwards, and plant part B to bend downwards.

Answer

(a) The position of plant parts A and B shows negative geotropism and positive geotropism respectively.

(b) Gravity is the stimulus which causes plant part A to grow and bend upwards, and plant part B to bend downwards.

77. Question

When the leaves of a sensitive plant are touched with a finger, they fold up and when light fades at dusk, the petals of a dandelion flower close.

(a) State one way in which the above two processes are similar.

(b) State two ways in which the above two processes differ.

Answer

(a) Above mentioned processes are similar i.e. both are nastic movements.

(b) In first process of folding of leaves of sensitive plant (thigmonasty), the stimulus is touch but in second process of folding of petals of dandelion flower (photonasty), stimulus is light. First process (thigmonasty) is not a growth movement but second process (photonasty) is a growth movement.

Very Short Answer Type Questions-Pg-115

1. Question

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

Answer

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

2. Question

What are the two parts of the vertebrate nervous system?

Answer

Central nervous system and peripheral nervous system are the two parts of the vertebrate nervous system.

3. Question

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

Answer

A reflex action occurs when the body responds to a stimulus without the involvement of the brain. Rapid pull out of hands from touching a hot surface and batting of eyelids are examples of reflex actions.

4. Question

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

Answer

A neuron, also known as nerve cell, is mainly consists of three components, namely cell body or soma, dendrites and axon.

5 A. Question

What are the short fibres of a neuron known as?

Answer

Dendrites are the short fibres of a neuron. They transmit impulses from synapses to cell body.

5 B. Question

What is the long fibre of a neuron known as?

Answer

Axon is the long fibre of a neuron. It carries the impulse away from the cell body.

6. Question

Name the most important part of the human brain.

Answer

Cerebrum is the largest and uppermost portion of the human brain.

7. Question

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

Answer

The cerebellum is the area of brain that controls motor movement coordination, balance, equilibrium and muscle tone.

8. Question

State one function each of cerebellum and pons.

Answer

Function of cerebellum: It controls motor movement coordination, balance, equilibrium and muscle tone.

Function of pons: It regulates the breathing process. It also takes part in sensations such as hearing, taste and balance.

9. Question

Name one hormone secreted by the pituitary gland.

Answer

Growth hormone (GH), also known as somatotropin, is secreted by anterior lobe of the pituitary gland.

10. Question

Where are hormones made in the human body?

Answer

Hormones are the chemical messengers produced by glands in the endocrine system.

11. Question

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

Answer

Hormones are the chemical messengers produced by glands in the endocrine system.

12. Question

Which gland secretes the growth hormone?

Answer

Growth hormone (GH), also known as somatotropin, is secreted by anterior lobe of the pituitary gland.

13. Question

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

Answer

(a) Testosterone hormone, also known as male sex hormone, is secreted by testes.

(b) Oestrogen and progesterone hormones are released by ovaries.

14. Question

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

(a) receptors for light

(b) receptors for heat

(c) receptors for sound

(d) receptors for smell

(e) receptors for taste

Answer

(a) The scientific name for light receptor is photoreceptor.

(b) The scientific name for heat receptor is thermoreceptor.

(c) The scientific name for sound receptor is phonoreceptor.

(d) The scientific name for smell receptor is olfactory receptor.

(d) The scientific name for taste receptor is gustatory receptor.

15. Question

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

Answer

Diabetes mellitus, also known as hyperglycemia, is caused by the deficiency of insulin hormone in the body.

16. Question

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

Answer

Goitre, an enlargement of the thyroid gland, is caused by the deficiency of thyroxine hormone in the body.

17. Question

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

Answer

Iodine is necessary for the making of thyroxine hormone by the thyroid gland which prevents goiter formation.

18. Question

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

Answer

Some patients of diabetes treated by giving injections of insulin because it decreases the blood sugar level in the body.

19. Question

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

Feedback mechanism is a method of controlling the hormone production.

20. Question

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.

Answer

(a) Thyroid is large, ductless gland present in the neck. It acts as an endocrine gland.

(b) Salivary glands present in and around the mouth and neck acts as an exocrine gland.

(c) Pancreas, an organ located in the abdomen, acts both as an endocrine gland as well as an exocrine gland.

21. Question

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

Answer

Diet provides iodine which makes keeps the thyroid gland healthy by making thyroxine hormone and also prevents goitre.

22. Question

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

Answer

In the diabetes (hyperglycemia) disease, the sugar level gets increased in the body.

23. Question

Name two parts of the body which contain receptors of chemical stimuli.

Answer

Nose contains olfactory receptor whereas tongue has gustatory receptor.

24. Question

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

Answer

Eye retina contains cells which are sensitive to light.

25. Question

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

Answer

Endocrine system and Nervous system are the two main communications systems in an animal's body.

26. Question

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) Thyroid, thymus, pituitary and ovary these all are ductless glands.

(b) Adrenalin, insulin, thyroxine and estrogen these all are hormones.

27. Question

Which parts of the body form the central nervous system?

Answer

Spinal cord and brain form the central nervous system (CNS).

28. Question

Give three examples of reflex actions.

Answer

Knee jerk reflex is an example of reflex action. The other examples include coughing and sneezing.

29. Question

Why do you need iodine in your diet?

Answer

Iodine is required to synthesize of thyroxine hormone in the body hence necessary in our diet.

30. Question

State whether coughing is a voluntary action or reflex action.

Answer

Coughing is an important defensive reflex that occurs through the stimulation of a complex reflex arc.

31. Question

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 a..... neuron.

Answer

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

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

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

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

Short Answer Type Questions-Pg-116

32 A. Question

What are the various sense organs in our body?

Answer

In human body, there are 5 sense organs present. They are eyes, ears, nose, tongue and skin.

32 B. Question

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

Answer

A receptor is an organ or cell able to respond to heat, light or other external stimulus and transmit a signal to a sensory nerve. Example: Photoreceptor (a receptor which detects light) and phonoreceptor (a receptor which detects sound).

An effector is a muscle, gland or an organ capable of responding to a stimulus, especially a nerve impulse.

33 A. Question

What is spinal cord? What is its main function?

Answer

The cylindrical bundle of nerve fibres and associated tissue which is enclosed in the spine and connects nearly all parts of the body to the brain. It functions primarily in the transmission of neural signals between the brain and the rest of the body.

33 B. Question

Give the functions of medulla.

Answer

The medulla helps regulate breathing, heart and blood vessel function, digestion, sneezing and swallowing. It is a center for respiration and circulation.

34 A. Question

Name the three types of nerves which constitute the peripheral nervous system.

Answer

Spinal nerves, cranial nerves and visceral nerves are the three types of nerves which constitute the peripheral nervous system.

34 B. Question

What is the difference between a reflex action and walking?

Answer

A reflex action is voluntary action which is a rapid and autonomic response to stimuli while walking is a voluntary action which requires our thinking and it's in our control.

34 C. Question

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

Answer

Agarbatti produces vapors on burning and generates a characteristics a fragrance which is detected by the olfactory receptors present in the nose. The electrical impulses are generated by the action of smell of agarbatti which sets off chemical reactions. Cerebrum, a sensory area present in the fore brain, receives these electrical impulses by which we can identify the smell of burning agarbatti.

35 A. Question

What substances are made by endocrine glands?

Answer

Hormones are produced by the endocrine glands. These hormones are responsible for different functions in the various organs of the body.

35 B. Question

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

Answer

A receptor is an organ or cell able to respond to heat, light or other external stimulus and transmit a signal to a sensory nerve. It detects all the information from our surroundings and carries it to the nervous system.

An effector is a muscle, gland or an organ capable of responding to a stimulus, especially a nerve impulse.

36 A. Question

Name the hormones secreted by the following endocrine glands:

(i) Thyroid gland

(ii) Parathyroid glands

(iii) Pancreas

(iv) Adrenal glands

Answer

(i) Thyroxine hormone is secreted by the thyroid gland.

(ii) Parathormone is secreted by the parathyroid glands.

(iii) Insulin hormone is secreted by the pancreas gland.

(iv) Adrenaline hormone is secreted by the adrenal glands.

36 B. Question

Write the functions of testosterone and oestrogen hormones.

Answer

Testosterone is the principle male sex hormone and is responsible for reproductive growth and development in male vertebrates.

Oestrogen is the principle female sex hormone and is responsible for development of female secondary sexual characteristics.

37 A. Question

Write the names of the regions in hindbrain. Give one function of each region.

Answer

There are mainly 3 regions present in hindbrain. They are:

(i) Pons: It regulates the breathing process. It also takes part in sensations such as hearing, taste and balance.

(ii) Cerebellum: It controls motor movement coordination, balance, equilibrium and muscle tone.

(iii) Medulla: It is the controlling centre for reflex actions like coughing, sneezing and swallowing etc. It also controls various involuntary actions like blood pressure and peristaltic movements of the elementary canal.

37 B. Question

Name the functions of cerebrum.

Answer

Function of cerebrum: It is the largest part of the brain and also known as cortex. It is associated with higher brain function such as thought, memory and action.

38 A. Question

The human brain can be broadly divided into three regions. Name these three regions.

Answer

Forebrain, midbrain and hindbrain are three regions of human brain.

38 B. Question

What is cranium? What is its function?

Answer

Cranium is a part of the skull in which brain is located. It protects the brain from damage.

39 A. Question

How does chemical coordination take place in human beings?

Answer

In human beings and other animals, the chemical coordination takes place through the chemical messengers, called hormones. These hormones are produced by specific organs and carry through blood stream to other body parts. They are affected only a particular place of specific organ which is known as target organ. The organs control and coordinate different functions like growth, development, behavior, metabolism and secondary sexual characteristics etc.

39 B. Question

Why is the use of iodized salt advisable?

Answer

Iodine is required to synthesize of thyroxine hormone in the body. This hormone is secreted by the thyroid gland and is responsible for metabolism of carbohydrates, fats and proteins. Taking of iodine is advisable to prevent from goiter disease.

40. Question

What is the function of insulin hormone? What types of patients are given insulin injections?

Answer

The insulin hormone lowers the blood sugar (glucose) level in the body. The people suffering from severe diabetes are treated by injecting insulin in the body.

41. Question

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

Answer

Nervous system coordinates the activities of body. It is responsible for the coordination of biological activities inside the body through the network of specialised cells called neurons. It receives the information from surroundings and processes through neurons and interprets it and then responds accordingly.

Endocrine system is a discrete set of glands that secrete different types of hormones to the circulatory system in order to regulate the functions of the body. Each gland of the endocrine system is responsible for the secretion of different hormones which act as messengers between the nervous system and the organs of body.

42. Question

State the functions of the following hormones:

(a) Thyroxine

(b) Adrenaline

(c) Growth hormone

Answer

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

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

(c) Growth hormone: Controls the growth of human body.

43. Question

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 endocrine glands present in the human body are:

(i) Pineal gland

(ii) Hypothalamus

(iii) Pituitary

(iv) Thyroid

(v) Parathyroid

(vi) Thymus

(vii) Pancreas

(viii) Adrenal glands

(ix) Testes (in males)

(x) Ovaries (in females).

Pancreas, testes and ovaries function as exocrine glands.

44. Question

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

The correct matching of hormones with their functions is as:

(i) – (d)

(ii) – (c)

(iii) – (e)

(iv) – (a)

(v) – (b)

45. Question

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

This is an example of reflex action. Here, drawing pin lying on the floor is the stimulus. The receptors located in the skin sense pain which triggers and impulse in a sensory neuron and transmits the message to the spinal cord. The impulse is passed onto a relay neuron which passes it to the motor neuron which passes the impulse to a muscle in the feet. It results contraction of muscle and pulling out feet away from the drawing pin.

46. Question

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

Answer

In human beings, puberty and adolescence are the result of sex glands. Testes in males produce testosterone, a male sex hormone, which is associated with male puberty. In boys, this stage appears an age of 13-14 years. Ovaries in females produce oesterogen, a female sex hormone, is responsible for all the changes associated with female puberty. In girls, this stage is usually attains at an age of 10-12 years.

47. Question

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

Answer

Neurons have cell membrane, nucleus and cytoplasm similar to other cells.

48. Question

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

(a) receptor and effector

(b) cerebrum and cerebellum

Answer

(a) A receptor is an organ or cell able to respond to heat, light or other external stimulus and transmit a signal to a sensory nerve.

An effector is a muscle, gland or an organ capable of responding to a stimulus, especially a nerve impulse.

(b) Cerebrum, a part of the forebrain, is responsible for controlling our thoughts, sensations, actions and movements.

Cerebellum, a part of the hindbrain, is responsible for maintaining the body posture and balance of the brain.

49. Question

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

Answer

Voluntary action is controlled by the brain whereas involuntary action is controlled by the spinal cord. Riding a bicycle, dancing, and eating an apple are some examples of voluntary actions while breathing, flow of blood through our veins, blinking eye lids, heart beating, feeling emotions, growing for that matter are all involuntary actions.

Digestion is a kind of involuntary action.

50. Question

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, a part of the forebrain, consists of two cerebral hemispheres.

(b) Spinal cord has spinal nerves attached to it.

51. Question

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

(a) Adrenaline hormone prepares the body for action.

(b) Insulin hormone controls the amount of glucose in blood.

(c) Testosterone hormone gives boys a deep voice.

(d) Oestrogen hormone gives girls soft skin.

52. Question

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) The smell of the food is a stimulus.

(b) Olfactory receptors are the cells in your nasal passages which perceive the smell.

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

Long Answer Type Questions-Pg-117

53 A. Question

Name the structural and functional unit of nervous system.

Answer

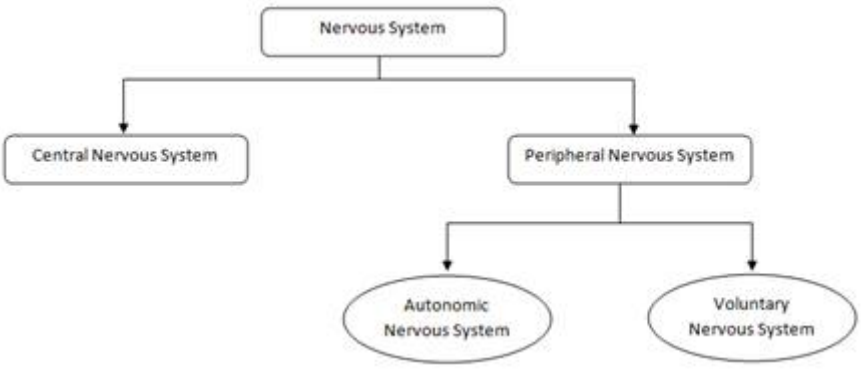
A neuron is the structural and functional unit of nervous system.

53 B. Question

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

Answer

The below flow chart depicts the classification of nervous system into various parts.



Example: A student who is getting late for school suddenly sees his watch then starts walking fast autonomously. Here, when the eyes see the time they send the information to brain through the sensory nerves. After which the brain receives the information, analyses them and sends the instructions to walk faster to muscle of our legs through the motor nerves. Then, the muscle of the legs act simultaneously by which student walks faster.

53 C. Question

What is autonomic nervous system? What is its function?

Answer

Autonomic nervous system is self-governing nervous system which controls and regulates the functions of the internal organs of our body involuntarily.

53 D. Question

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

Answer

The voluntary nervous system helps us to take voluntary actions which are under the conscious control of the brain.

Example: A student who is getting late for school suddenly sees his watch then starts walking fast autonomously. Here, when the eyes see the time they send the information to brain through the sensory nerves. After which the brain receives the information, analyses them and sends the instructions to walk faster to muscle of our legs through the motor nerves. Then, the muscle of the legs act simultaneously by which student walks faster.

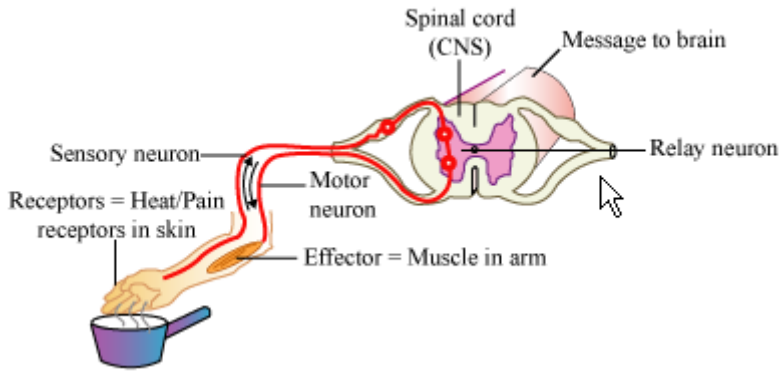
54 A. Question

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

Answer

A reflex action is an involuntary, rapid response in the body to a stimulus.

Example: Moving our hand away on touching a hot bowl.

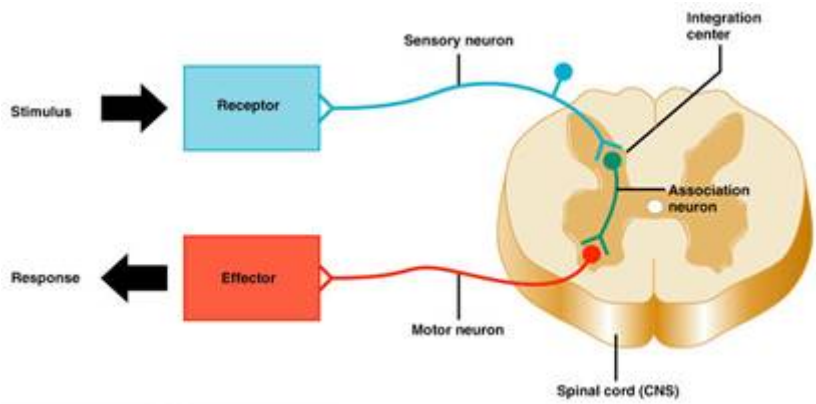


54 B. Question

Define reflex arc. Give the flow chart of a spinal reflex arc.

Answer

Reflex arc is the pathway taken by the nerve impulses in the reflex actions.



54 C. Question

How are involuntary actions and reflex actions different from each other?

Answer

All reflex actions are involuntary in nature but all involuntary actions are not reflexes. A reflex action is a rapid and autonomic response to a stimulus which is not under the voluntary control of the brain. Involuntary actions do not need thinking and also not performed by us knowingly. Sneezing and coughing are the examples of reflex actions whereas digestion and respiration are involuntary actions.

55 A. Question

What is the function of our nervous system?

Answer

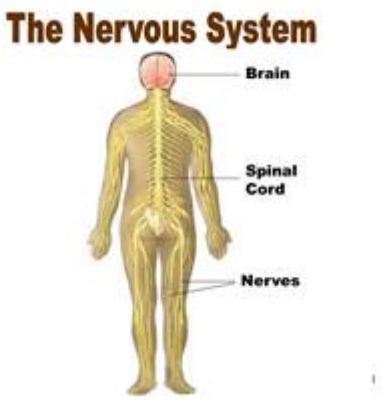
The nervous system consists of the brain, spinal cord, sensory organs and all of the nerves that connect these organs with the rest of the body. Its main function is to establish the communication system between the organs of our body. It receives information from the surroundings, processes it, interprets it and then responds accordingly.

55 B. Question

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

Answer

Brain, spinal cord and nerves are the main organs of the nervous system.



55 C. Question

How does the human nervous system work? Explain.

Answer

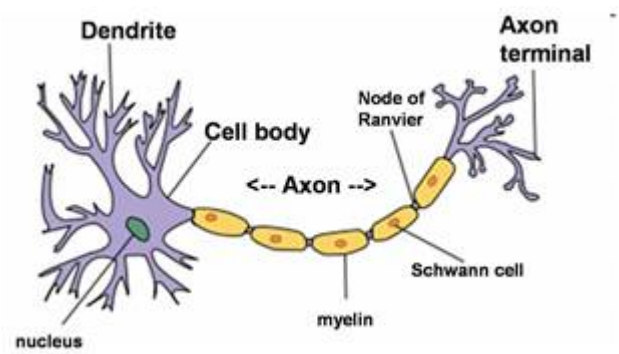
After affecting, the sense organ in our body sends the message (in the form of electrical impulses) to brain through the sensory neurons. The brain reads the signals and decides the necessary action to be taken out. Then, brain sends out the instructions through motor nerves to the body muscles of concerned part and then this part acts accordingly.

56 A. Question

What is a neuron? Draw a labelled diagram of a neuron.

Answer

A neuron, also known as nerve cell, is a cell that carries message between the brain and other body parts. It is the basic unit of the nervous system.

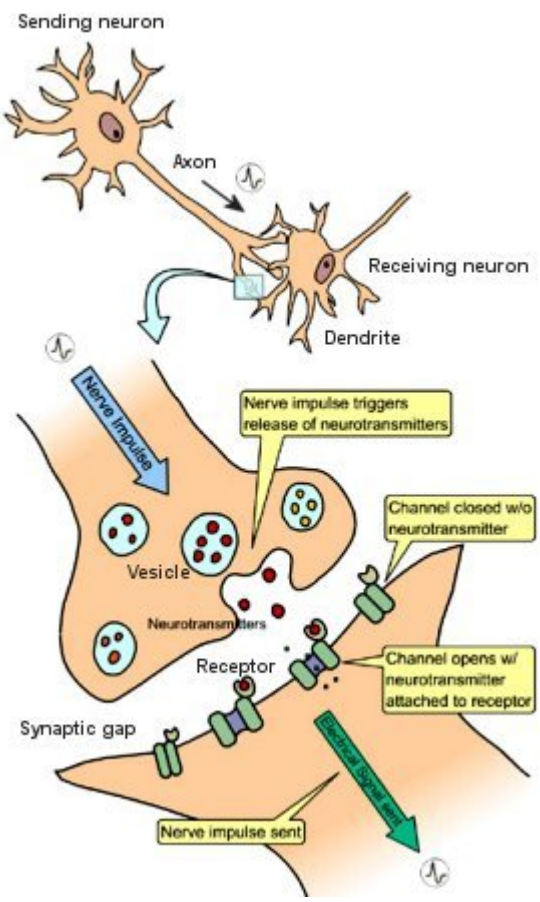


56 B. Question

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

In the nervous system, the synapse is a junction between two nerve cells, consisting of a minute gap across which impulses pass by diffusion of a neurotransmitter. Synapse between two neurons allows electrical impulses to pass in one direction only. The process is as follows: When the receptor sends an electrical impulse, it reaches at the end of the axon of sensory neuron. Then this electrical impulse releases a chemical, known as neurotransmitter, in very small amount into the synapse between two adjacent neurons. Neurotransmitter crosses the synapse and starts a similar electrical impulse in the dendrite of the next neuron. By this way, the electrical impulse passes from one neuron to the next across the synapse.



57 A. Question

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

Answer

Both nervous system and endocrine system are two systems which taken together perform the functions of control and coordination in human beings.

57 B. Question

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

Answer

The Central Nervous System (CNS) is made up of brain and spinal cord. The CNS is the main control center of the body. It takes in sensory information, organizes and synthesizes this input, then provides instructions for motor output to the rest of the body. In other words, it functions as the transmitter and receiver as well as the pathway for information flow and determines how the body responds to changes in its internal and external environment.

57 C. Question

Give the various functions of brain.

Answer

Functions of the brain: The brain is the command centre for the nervous system. It receives input from the sensory organs and sends output to the muscles. Intelligence, creativity, emotions, and memory are a few of the many things governed by the brain. It also controls the thoughts, memory and speech, movement of the arms and legs, and the function of many organs within the body.

58 A. Question

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

Answer

(i) Pituitary gland secretes growth hormone.

(ii) Thyroid gland secretes thyroxine hormone.

(iii) Pancreas secreted insulin hormone.

(iv) Adrenal gland secretes adrenaline hormone.

(v) Testes secrete testosterone hormone.

58 B. Question

How do hormones reach the organs they control?

Answer

The endocrine glands are ductless glands which secrete their products as hormones. They release hormones directly into the blood stream. These hormones reach the target body part through the blood and then act on it.

58 C. Question

Name the gland which controls the secretion of hormones from the pituitary.

Answer

Hypothalamus gland controls the secretion of hormones from the pituitary.

58 D. Question

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

Answer

The adrenaline hormone is secreted by adrenal gland, a gland present on top of the kidney. During emergency situations like anger, danger and stress etc., this hormone prepares our body to function at maximum efficiency. It increases blood flow into muscles, breathing and heart rate and causes liver to put more stored glucose into our blood which causes production of high energy. Thus, if adrenaline is secreted in large amounts then it prepares our body for action.

58 E. Question

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

The Goitre disease occurs in adults due to deficiency of iodine in the diet. In this disease, the neck of the person gets swollen due to the enlargement of thyroid gland.

Multiple Choice Questions (MCQs)-Pg-117

59. Question

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

A receptor is an organ or cell able to respond to heat, light or other external stimulus and transmit a signal to a sensory nerve. Example: Photoreceptor (a receptor which detects light) and phonoreceptor (a receptor which detects sound).

60. Question

Which of the following cannot be considered a receptor?

A. ear

B. nose

C. muscle

D. eye

Answer

Muscle is not a receptor.

61. Question

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

Pancreas gland acts as an endocrine gland as well as an exocrine gland.

62. Question

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

A. cerebellum

B. cerebrum

C. medulla

D. pons

Answer

The cerebellum is the area of the hindbrain that controls motor movement, coordination, balance, equilibrium and muscle tone.

63. Question

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

A. 21

B. 31

C. 41

D. 51

Answer

There are total 31 pairs of nerves arise from the spinal cord.

64. Question

Cerbellum, medulla and pons are the parts of:

A. mid-brain

B. hind-brain

C. forebrain

D. spinal cord

Answer

Hindbrain consists of cerebellum, medulla and pons.

65. Question

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

A person spits out immediately when a fly enters his mouth while talking and a person's pupil contracts at once in the presence of bright light are cerebral reflexes.

66. Question

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

A. adrenaline

B. auxin

C. thyroxine

D. insulin

Answer

Iodine is necessary for the synthesis of thyroxin hormone which is released by the thyroid gland and prevents from goiter disease.

67. Question

Which of the following is a mis-matched pair?

A. adrenaline : pituitary gland

B. estrogen: ovary

C. pancreas : insulin

D. progesterone : ovary

Answer

Adrenaline hormone is released from adrenal gland.

68. Question

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

Insulin does not regulate growth and development of the body.

69. Question

The spinal cord originates from:

A. cerebrum

B. cerebellum

C. medulla

D. pons

Answer

The spinal cord is a long, thin, tubular bundle of nervous tissue and support cells that extends from the medulla oblongata.

70. Question

The involuntary actions in the body are controlled by:

A. medulla in forebrain

B. medulla in hindbrain

C. medulla in spinal cord

D. medulla in midbrain

Answer

The involuntary actions in the body are controlled by medulla which is located in hindbrain.

71. Question

Which of the following is not an involuntary action?

A. vomiting

B. chewing

C. heart beat

D. salivation

Answer

Chewing is a voluntary action.

72. Question

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

A. testosterone

B. growth hormone

C. adrenaline

D. insulin

Answer

The adrenaline hormone is secreted by adrenal gland, a gland present on top of the kidney. During emergency situations like anger, danger and stress etc., this hormone prepares our body to function at maximum efficiency.

73. Question

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

A. cerebrum

B. cerebellum

C. pons

D. medulla

Answer

The involuntary actions like peristaltic movements of alimentary canal in the body are controlled by medulla which is located in hindbrain.

74. Question

The hormone which is associated with male puberty is called:

A. oestrogen

B. adrenaline

C. testosterone

D. progesterone

Answer

Testosterone hormone is secreted by testes and responsible for male puberty and other secondary sexual characters.

75. Question

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

Pituitary gland does not occur as a pair in the human body. It has 2 lobes: anterior lobe and posterior lobe.

76. Question

The junction between two adjacent neurons is called:

A. nerve junction

B. sensory junction

C. synapse

D. neuro-muscular joint

Answer

In the nervous system, the synapse is a junction between two nerve cells, consisting of a minute gap across which impulses pass by diffusion of a neurotransmitter.

77. Question

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

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

78. Question

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

Insulin hormone decreases the blood sugar level.

79. Question

All the voluntary actions of our body are controlled by:

A. cerebrum

B. cerebellum

C. pons

D. medulla

Answer

The part of the brain that controls voluntary actions is cerebrum, the largest part of the brain.

80. Question

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

C. Iodine is essential for the synthesis of thyroxine

D. Thyroid gland can enlarge due to lack of thyroxine

Answer

Thyroid gland requires iodine to synthesise thyroxine hormone.

81. Question

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

Pituitary gland does not act as an endocrine gland as well as an exocrine gland.

82. Question

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

A. pons

B. medulla

C. cerebrum

D. cerebellum

Answer

The medulla oblongata connects the brain to the spinal cord and controls involuntary actions.

83. Question

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

Answer

Growth hormone (GH) is responsible for growth and development in human. Less secretion of this hormone results dwarfism.

84. Question

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

Testosterone hormone, also known as male sex hormone, is secreted by testes. Oestrogen and progesterone hormones are released by ovaries. Both testosterone and oesterogen are responsible for puberty in males and females respectively.

85. Question

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

Gustatory receptors are present in the tongue and are responsible for detecting taste. Olfactory receptors are present in the nose and responsible for detecting smell.

86. Question

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

A. medulla

B. pons

C. cerebellum

D. cerebrum

Answer

Pons of the human brain takes part in regulating respiration in the human body.

87. Question

Electrical impulse travels in a neuron from:

A. dendrite $\rightarrow$ axon $\rightarrow$ axon end $\rightarrow$ Cell body

B. cell body $\rightarrow$ dendrite $\rightarrow$ axon $\rightarrow$ axon end

C. dendrite $\rightarrow$ cell body $\rightarrow$ axon $\rightarrow$ axon end

D. axon end $\rightarrow$ axon $\rightarrow$ cell body $\rightarrow$ dendrite

Answer

The electrical impulse travels in a neuron from dendrite to cell body to axon to axon end.

88. Question

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

In a synapse, chemical signal is transmitted from axon end of one neuron to dendrite end of adjacent neuron.

89. Question

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

The conversion of electrical signal to a chemical signal occurs at axon end in a neuron.

90. Question

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

A. Receptor → 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

D. Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Answer

The correct sequence of the components in a reflex arc is as follows:

Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

91. Question

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

Both statements (i) and (iv) are true.

92. Question

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

The gustatory receptors of our body are responsible for taste.

93. Question

The olfactory receptors in humans are located in:

A. eyes

B. tongue

C. ears

D. nose

Answer

The olfactory receptors of our body are responsible for smell.

94. Question

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

The contraction of pupil of the eye in the presence of bright light is an example of cerebral reflex.

95. Question

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

The Growth hormone (GH) is secreted by pituitary gland. This hormone is responsible for controlling the growth and development in humans.

96. Question

The underactive endocrine gland which causes goitre is:

A. pancreas

B. thyroid

C. adrenal

D. pituitary

Answer

The thyroxine hormone is secreted by thyroid gland. The lack of this hormone causes goiter in humans.

97. Question

The endocrine gland whose malfunctioning causes diabetes disease is:

A. pituitary

B. pineal

C. parathyroid

D. pancreas

Answer

Pancreas gland secretes the insulin hormone which controls the blood sugar level and prevents from diabetes disease.

98. Question

The use of iodized salt is recommended to prevent:

A. diabetes

B. gonorrhoea

C. dysentery

D. goitre

Answer

Goitre disease is caused to lack of iodine in the diet.

99. Question

Which of the following are often called glands of emergency?

A. thyroid

B. pituitary

C. adrenal

D. pancreas

Answer

Adrenaline hormone, a hormone is released from adrenal gland, is also known as emergency hormone. During emergency situations like anger, danger and stress etc., this hormone prepares our body to function at maximum efficiency.

Questions Based on High Order Thinking Skills (HOTS)-Pg-120

100. Question

P is a cell (or group of cells) in the human body which is sensitive to a particular type of stimulus and conveys the messages to CNS through nerves Q. On the other hand, R is a part of the human body which can respond to a stimulus according to the instructions sent from the CNS through nerves S.

(a) What is P? Name five organs which contain cells (or group of cells) like P.

(b) Name the nerves Q.

(c) What is R? Give two examples of R.

(d) Name nerves S.

(e) How do messages travel through the nerves Q and S?

Answer

(a) In above question, the P is a receptor. Eyes, ears, nose, tongue and skin contain cells like P (receptor).

(b) Nerves Q are sensory nerves.

(c) In above question, R is the effector. Muscles and glands are the examples of R (effectors).

(d) Nerves S are motor nerves.

(e) Messages travel through nerves Q (sensory nerves) and S (motor nerves) in the form of electrical impulses.

101. Question

The human body contains a large number of cells A which are very long and branched, and look like electric wires. The longest branch of this cell is B whereas there are many small branches C. Any two A cells do not join to one another completely in the human body. There is a microscopic gap D between every pair of adjacent A cells through which electric impulses can pass by the release of a chemical substance.

(a) What are cells A?

(b) What is the name of (i) branch B, and (ii) branches C?

(c) What is the microscopic gap D known as?

(d) What is the function of cells like A in the human body?

(e) The cells A are of three types. Name the three types.

Answer

(a) In above question, cells A are neurons or nerve cells.

(b) (i) Branch B is axon and (ii) C branches are dendrites.

(c) The microscopic gap D is known as synapse.

(d) Cell A or Neurons transmit electrical signals or impulses to and from the central nervous system.

(e) Cell A or Neurons are of three types: Sensory neurons, motor neurons and relay neurons.

102. Question

When we touch a hot plate unknowingly, then this heat is sensed by a receptor P present in our fingers. The receptor triggers an impulse in neuron Q which transmits the message to an organ R which is a part of the central nervous system. Here the impulse is passed on to a neuron S which in turn passes it to a yet another neuron T. The neuron T passes the impulse to a tissue U in our arm. The tissue U then contracts and pulls our hand away from the hot plate.

'(a) What is the name of (i) receptor P (ii) neuron Q, and (iii) organ R?

(b) What is (i) neuron S, and (ii) neuron T?

(c) Name the tissue U.

(d) What name is given to the phenomenon in which hand is pulled away quickly from the hot plate?

(e) Name the effector in this whole process.

Answer

(a) (i) In above question, the receptor P is thermoreceptor.

(ii) The neuron Q is a sensory neuron and

(iii) The organ R is spinal cord.

(b) (i) The neuron S is a relay neuron.

(ii) The neuron T is a motor neuron.

(c) The tissue U is a muscle.

(d) Reflex action is phenomenon in which hand is pulled away quickly from the hot plate.

(e) Muscle of arm is an effector in this process.

103. Question

The gland X which is located just below the brain in the human head secretes a chemical substance Y which controls the development of bones and muscles in the body of a person. Secretion of too little of substance Y as well as the secretion of too much of substance Y by the gland X leads to abnormal development of the body of a person.

(a) Name the gland X.

(b) What is the chemical substance Y?

(c) What happens if too little of substance Y is secreted?

(d) What happens if too much of substance Y is secreted?

(e) Name the system of glands in the human body of which gland X is a part.

Answer

(a) In above question, the gland X is pituitary gland.

(b) The chemical substance Y is Human growth hormone.

(c) If too little of substance Y is secreted then the person becomes a dwarf (very short) because growth hormone is responsible for growth and development in humans.

(d) If too little of substance Y is secreted then the person becomes a giant (very tall) because growth hormone is responsible for growth and development in humans.

(e) Gland X (pituitary gland) is a part of the endocrine system.

104. Question

A and B are the two systems of control and coordination in the human body. The messages in system A are transmitted in the form of chemical substances C which travel comparatively slowly through the blood stream. The substances C are made in tissues D present in the head and trunk of human body. The messages in system B are transmitted very quickly in the form of electrical impulses through fibres E. The effect of messages transmitted by system B usually lasts for a much shorter time as compared to those transmitted by system A.

(a) Name the system A. What does system A consist of?

(b) Name the chemical substance C.

(c) What is tissue D? Name any five such tissues in the human body.

(d) Name the system B. What does system B consist of?

(e) Name the fibres E.

(f) State whether system A controls the working of system B or system B controls the working of system A.

Answer

(a) In above question, the system A is endocrine system. System A (Endocrine system) consists of glands.

(b) The chemical substance C is hormones.

(c) The tissue D is endocrine glands. Pineal, thyroid, pancreas, pituitary and ovaries are five such tissues in the human body.

(d) The system B is nervous system. The system B (nervous system) consists of brain, spinal cord and nerves.

(e) The fibre E is nerve fibres.

(f) The system B (nervous system) controls the functioning of system A (Endocrine system).

105. Question

A cylindrical structure P in our body begins in continuation with medulla and extends downwards. It is enclosed in a bony cage Q and surrounded by membranes R. As many as x pairs of nerves arise from the structure P. The structure P is involved in the reflex actions of our body and conduction of

nerve impulses to and from another organ S of our body with which it forms CNS.

(a) Name the structure P.

(b) Name (i) bony cage Q, and (ii) membranes R.

(c) How much is x?

(d) Name the organ S.

(e) What are the reflexes involving structure P only known as?

Answer

(a) In above question, the structure P is spinal cord.

(b) The bony cage Q is vertebral column and membranes R is meninges.

(c) The value of X is 31.

(d) The organ S is brain.

(e) The reflexes involving structure P (Spinal cord) only are known as spinal reflexes.

106. Question

The pancreas is made up of two parts A and B. The part A secretes insulin whereas part B secretes pancreatic juice.

(a) Which part is functioning as an endocrine gland? Why?

(b) What is insulin and what effect does it have in the body?

(c) Name the disease which can be treated by giving insulin injections.

(d) What does pancreatic juice contain? Where does pancreatic juice go?

(e) Name the life process in which pancreatic juice is made use of.

Answer

(a) In above question, Part A is functioning as an endocrine gland because it secretes insulin hormone.

(b) Insulin is a hormone secreted by pancreas. It controls the blood sugar level and prevents from diabetes diseases.

(c) In diabetes, the patients are treated by injecting insulin injections.

(d) Digestive enzymes like pancreatic amylase, tryspin and lipase are present in the pancreatic juice. This pancreatic juice goes to small intestine.

(e) In digestion process, the pancreatic juice is made use of.

107. Question

The gland A is attached to the wind pipe in the human body. The gland A makes and secretes a hormone B which controls the metabolism of carbohydrates, fats and proteins in the body. The non-metal element C is necessary for the formation of hormone B. The deficiency of C in the diet can cause a deficiency of hormone B in the body leading to a disease D in which the neck of a person appears to be swollen. People are advised to use salt E in cooking food so as to avoid disease D.

(a) Name (i) gland A, and (ii) hormone B

(b) What is the element C?

(c) Name one type of food which can provide sufficient C in the diet of a person.

(d) Name (i) disease D, and (ii) salt E.

Answer

(a) (i) In above question, the gland A is thyroid gland

(ii) The hormone B is thyroxine hormone which is released from the gland A (thyroid gland).

(b) The element C is iodine.

(c) Sea food like fish can provide sufficient element C (iodine) in the diet of a person.

(d) (i) The disease D is goiter.

(ii) The sale E is iodised salt.

108. Question

A piece of thread was tied tightly around an animal's pancreatic duct. The animal subsequently had difficulty in digesting food but did not get diabetes. Explain.

Answer

After tying a piece of thread around the animal's pancreatic duct, it gets closed. By this, the digestive enzymes present in the pancreatic juice cannot reach into small intestine. Animals feel difficulty to digest the food in the absence of pancreatic juice. However, the pancreas secretes insulin hormone directly in the blood by which the animal does not get diabetes.

109. Question

Which is the target organ of both adrenaline and insulin?

(a) heart

(b) kidney

(c) liver

(d) pancreas

Correct Answer: (c)

Answer

Both adrenaline and insulin act on liver in the body hence, the liver is the target organ for both these hormones.

110. Question

A gland W is located just below the stomach in the human body. The gland W secretes a hormone X. The deficiency of hormone X in the body causes a disease Y in which the blood sugar level of a person rises too much. The person having high blood sugar is called Z.

(a) Name (i) gland W, and (ii) hormone X.

(b) What is the function of hormone X?

(c) Name (i) disease Y, and (ii) person Z.

(d) What advice would you like to give to a person who is suffering from disease Y due to faulty life-style?

Answer

(a) (i) In above question, the gland W is Pancreas.

(ii) The hormone X is insulin, secreted by gland W (pancreas).

(b) The hormone X (insulin) controls the blood sugar level and prevents from diabetes disease.

(c) (i) The disease Y is diabetes and (ii) the person Z is known as a diabetic person.

(d) In disease Y (diabetes), the patient should reduce his weight, take balance and control diet, avoid intake of more sugar in meal, do regular physical exercise and yoga, go for routine medical checkup and take medicines regularly.

111. Question

There are two similar glands P which are located on the top of two similar organs Q in the human body. The glands P are often called glands of emergency and they secrete a hormone R into the blood stream. The hormone R is secreted in large amounts when a person is frightened. It brings about temporary changes in the body which allow a lot of substance S from the liver to go into blood so as to provide a lot of energy in a very short time.

This helps the person concerned to fight back or run away from the frightening situation. What are P, Q, R and S?

Answer

(i) In above question, the gland P is adrenal glands.

(ii) The organ Q is kidneys.

(iii) The hormone R is adrenaline hormone

(iv) The substance S is glucose.

112. Question

The two glands A and B which occur in pairs, are present in the endocrine system of humans. The pair of glands A is found only in females whereas the pair of glands B occurs only in males. The glands A make and secrete two hormones C and D whereas glands B make and secrete only one hormone E. In addition to hormones, glands A make gametes F whereas glands B make gametes G.

(a) What are glands A?

(b) What are hormones C and D?

(c) What are glands B? Name the hormone E.

(d) What are gametes (i) F, and (ii) G?

(e) Which event in the life of males and females is associated with the secretion of hormones C, D and E?

Answer

(a) In above question, the glands A are ovaries.

(b) The hormone C is oesterogen whereas hormone D is progesterone.

(c) The glands D are Testes. The hormone E is testosterone (a male sex hormone) released from gland D (testes).

(D) (i) The gametes F are ova or eggs.

(ii) The gametes G are sperms.

(e) In both males and females, puberty is associated with the secretion of hormones C (oesterogen), D (progesterone) and E (testosterone).

113. Question

The organ A which is located inside the skull of our body is protected by a bony box Band it is surrounded by three membranes C. The space between the membranes is filled with a liquid D which protects the organ A from

mechanical shocks. The organ A in combination with another organ E makes up the central nervous system.

(a) What is organ A?

(b) What are (i) B (ii) C, and (iii) D ?

(c) Name the organ E.

(d) While walking barefooted, if we happen to step on a sharp piece of stone, we immediately lift our foot up. Which of the two organs, A or E, is directly involved in this action?

(e) If we step out from a darkened room into bright sunshine, we close our eyes for a moment. Which of the two organs, A or E, is directly involved in this action?

Answer

(a) In above question, the organ A is brain.

(b) (i) The membrane B is cranium or skull.

(ii) The membrane C is Meninges.

(iii) The membrane D is cerebrospinal fluid.

(c) The organ E is spinal cord.

(d) The organ E (spinal cord) is directly involved in the action mentioned in the question.

(e) The organ A (brain) is directly involved in the action mentioned in the question.

114. Question

Write down the following in the correct order for a simple reflex arc:

(a) impulse travels in motor fibre

(b) impulse travels in sensory fibre

(c) effector organ stimulated

(d) impulse crosses synapse

Answer

(a) →

(b) →

(c) →

(d) →

115. Question

Explain why, the tongue may be considered to be both a receptor and an effector organ.

Answer

Tongue has taste buds hence, it is considered as a receptor. Taste buds act as receptors (gustatory receptor) for different kinds of taste. Tongue is a muscular organ having muscles which can respond to a stimulus hence, it is also considered to be an effector.