

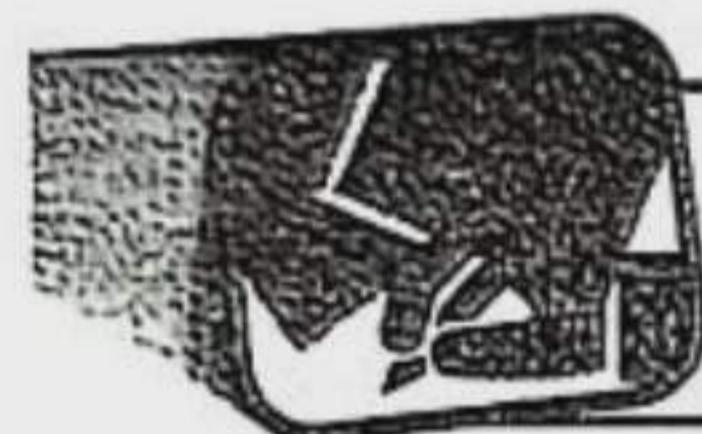
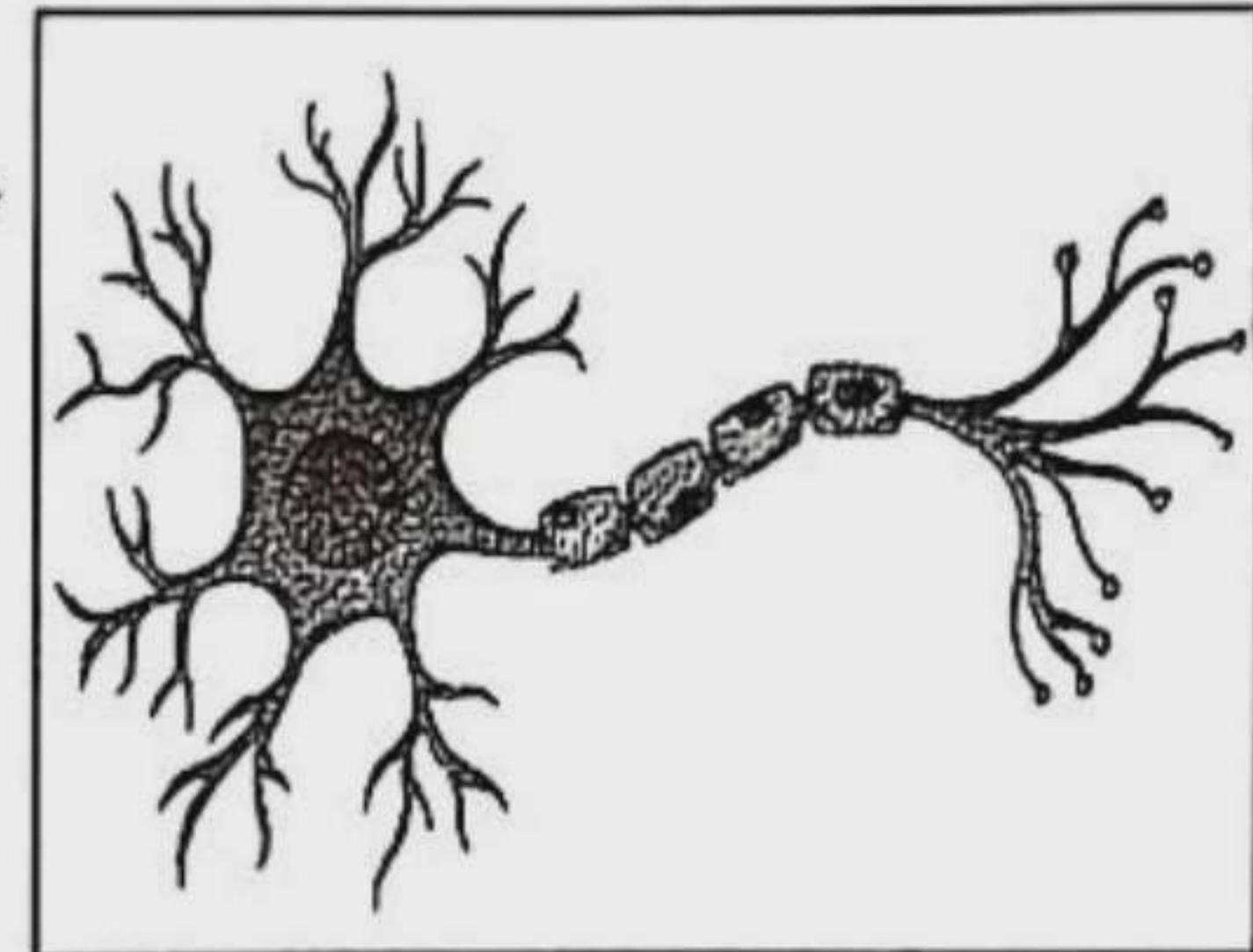
Co-ordination and Secretion

Contents for Discussion

- Co-ordination in plants • Nervous System • Brain • Spinal Cord • Excretory System.

 **Learning Outcomes :** After studying this chapter I will be able to—

- explain co-ordination in plants and human;
- explain the function of nervous system with a flow chart;
- explain with example the stimulating activity of plants;
- explain with example the stimulating activity of human;
- explain the excretion of plants and animals.



Practice



Multiple Choice, Short & Creative Q/A
following 100% accurate format for best prep.

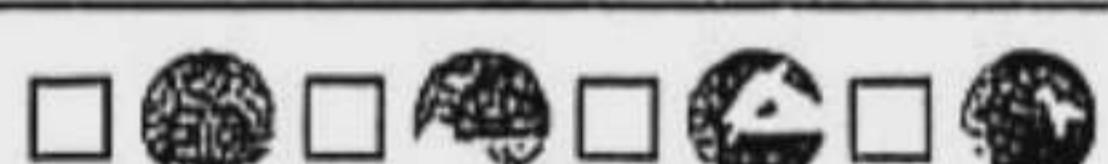
Dear learners, the Q/A of this chapter have been divided into exercise, multiple choice, short, creative & exercise-based activities in light of the learning outcomes. Practice the questions well to ensure the best preparation in the exam.



Textual Q/A



Let's learn the textbook Q/A



Short Answer Questions



Question 1. Describe the importance of hormone.
Ans. Hormones like auxin, gibberellin, cytokinin and flowering hormones are of vital necessity for plant life. Auxin increases the length of the cells, produce apical dominance, initiates the formation of root and help produce seedless fruit. It is also used for germination, floriculture and tissue culture. It helps prevent premature falling of fruits. Ethylene promotes ripening of fruits. Gibberellin increases the length of stem, breaks the dormancy of seeds and buds and help flowers bloom. Cytokinin accelerates cell division and is used for producing seedless fruits and also in tissue culture.

Hormones are also of vital necessity for animal life. For example, lack of insulin causes diabetes, lack of TSH causes thyroidal dysfunction. That male voice is different from female voice is also a hormonal phenomenon.

Question 2. Mention the function of auxin and gibberellin.

Ans. Functions of auxin : It stimulates cell elongation and ethylene synthesis. It promotes phototropism, gravitropism, apical dominance and vascular differentiation.

Functions of gibberellin : It stimulates shoot elongation. It regulates production of hydrolic enzymes in grains. It also stimulates bolting and flowering in biennials.

Question 3. Explain reflex action.

Ans. Reflex action is an automatic and instant neural mechanism that ensures immediate physical response or defense. The simplest type of neural circuit is a reflex arc. It begins with a sensory input and ends with a motor output. This arc passes through a sequence of neurones in between. For example 'withdrawal reflex' is a form of reflex action that causes the hand to jerk back after a hot stove is touched. It evokes an action potentials, which are transmitted along the axon of the receptor cell into the spinal cord and then projected to the brain. The action potentials travel down their axons to the point where they make excitatory synaptic contacts with muscle cells. The excitatory signals induce contraction of the muscle cells which causes the joint angles in the arm to change by pulling the arm away.

Question 4. Describe the function of kidney.

Ans. The two kidneys are considered to be the main organ of the excretory system. They are also called the urine factory. Each of the kidneys works as a strainer. The kidneys decompose the surplus amount of amino acid of our body and produce nitrogenous wastes such as urea, uric acid and ammonia which are harmful to the body. The kidneys drain these harmful wastes through urine. They also filtrate harmful substances of blood and drains them out in the same way. This filtration goes on every second. Any damage or dysfunction of either kidney is a life-threatening disease.

**MCQs with Answers**

1. Which one of the following helps flowering (blooming)?
 - Ⓐ Gibberellin Ⓑ Cytokinin
 - Ⓑ Florigen Ⓒ Auxin

► **Explanation :** Gibberellin-Growth influencer and effective in breaking the dormancy of seeds. Cytokinin – Growth hormone.

Florigen – Helps in flowering in plants.

Auxin – Prevents premature fruit drop.
2. Which organ of the human body plays the key role in eliminating nitrogenous waste products?
 - Ⓐ Kidney Ⓑ Skin Ⓒ Nose Ⓓ Anus

► **Explanation :** Lungs, skin and kidneys are the three excretory organs. Carbon dioxide is eliminated through the lungs and harmful substances like salts are eliminated through the skin. Nitrogenous liquid pollutants of the body are discarded through the kidneys. 80 percent of nitrogenous waste products of the body are discarded through urine. That is, the kidneys play a major role.

Read the following paragraph and answer questions no. 3 and 4 :

Proma planted a money plant in a tub near the window of her room: As the plant grows fast, the twigs and tendrils bend towards the window. She brought the vine inside the room but the same thing happened again.
3. Why does Proma's money plant creep towards the window?
 - Ⓐ Air Ⓑ Water vapour
 - Ⓑ Light Ⓒ Heat

► **Explanation :** The reason why the Proma's plant bends towards the window due to the plant's stem grows towards the light and the root grows away from the light.
4. Enhances the growth of Proma's money plant—.
 - i. Gibberellin
 - ii. Auxin
 - iii. Ethylene

Which one of the following is correct?

 - Ⓒ i Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii

► **Explanation :** Gibberellin – Under its influence, the internodes of the plant increase in the length.

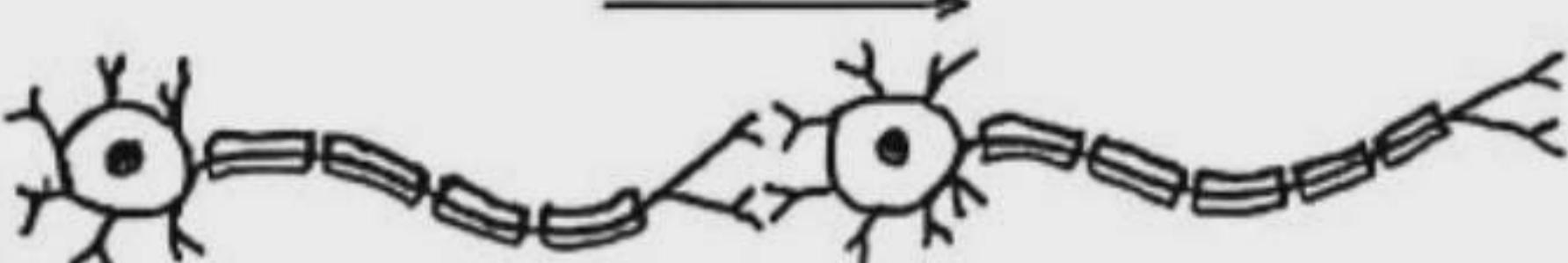
Auxin – Growth influencing hormone. Under its influence, the plumule bend towards the light source and grow.

Ethylene – Helps the plant grow taller by increasing the stem of the plant.

So, auxin and ethylene help in the growth of the Proma's money plant.

**Creative Questions with Answers****Ques. 01**

Transmission of impulse



- a. What is hormone? 1
- b. Explain the role of auxin in plants. 2
- c. Explain the position of the above cell in cerebrum. 3
- d. What are the importance of the above cell in transmitting impulses in human body? Explain. 4

Answer to Question No. 01 :

a. Cells produce a number of different biochemical substances which regulate, enhance or inhibit the functioning of some other cells. These biochemical substances are called hormones.

b. **Role of auxin in plants :** Auxin stimulates cell elongation and ethylene synthesis. It promotes phototropism, gravitropism, apical dominance and vascular differentiation.

c. The cells drawn above in human cerebrum are two neurones. They belong to the nervous system. In vertebrates including humans, the nervous system is divided into CNS (Central Nervous System) and PNS (Peripheral Nervous System). Cerebrum is divided into right and left cerebral hemispheres which are composed of gray matter and white matter. Gray matter is found in cluster of neurones in the brain and spinal cord and also in cortical layers. These clusters form nucleus in the cerebrum and acts as work centre of vision, hearing, smell, thought, memory, knowledge, intellect, conscience and movement of muscles.

d. In transmission of stimuli within human body, the significance of neurones or nerve cells are simply great. Each nerve cell sends signals to the others and so on or even from one part of the body to the others. The nervous system is composed of millions of nerve cells. The system provides 'point to point' signals — neurones project their axons to specific target areas. The nervous system controls the body. It co-ordinates the activities of different organs of the body. Each unit of the nervous system (neurone) receives stimuli and creates proper sensation. Thought, sensation, smell, vision, hearing, memory, conception, intellect, movement of muscle — all belong to the regulation of the nervous system consisting of millions of nerve cells.

Ques. 02 Apu was drawing the picture of the unit of nervous system, attentively. At that time his sister Kanta poked him with her elbow from behind. Apu caught hold of Kanta's hand without seeing her. Then Apu told Kanta there is a relationship between his drawing and the catching of her hand.

- What is the main excretory organ of human body? 1
- What do you mean by tropic movement? 2
- Describe the structure that Apu was drawing. 3
- How is the ability of catching Kanta's hand related to the nervous process of Apu's body? Explain. 4

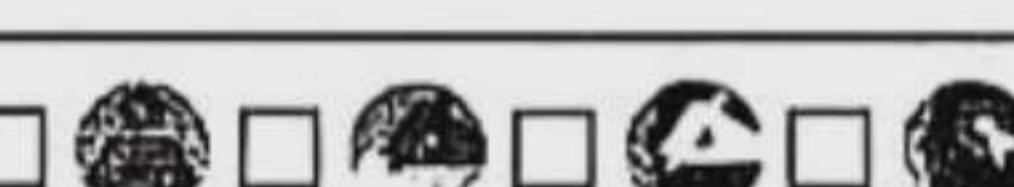
Answer to Question No. 02 :

- a** The kidney is the main excretory organ of human body.
- b** The movement of a plant during its growth can be either directional or non-directional. If movement takes place in the direction of the stimulus, it is known as tropic movement. The most common tropic movements are phototropism and geotropism.

c Apu was drawing a neurone — the structural unit of the nervous system. A mature neurone has two parts. These are :

- **Cell body** : It is nucleated and generally polygonal. The neurone cannot divide because there is no active centriole in the cytoplasm.
- **Processes** : The branched, tree like structures that extend from the cell body are called process. The processes are of two types, such as axon and dendron..

d The process in which Apu instantly caught Kanta's hand is known as reflex action. Let us cite another example. We jerk back our hand immediately after a hot stove is touched. The reflex arc of the neurone begins with a sensory input and ends with a motor output, passing through a sequence of neurones in between. When Kanta poked on Apu's skin, the painful impulse transmitted into his spinal cord and then projected into his brain. Since the excitation was strong enough, the motor neurones generated action potentials. This induced Apu's arm muscles to catch Kanta's hand instantly.

**Multiple Choice Q/A****Designed as per topic****Lesson 1–3 : Co-ordination in plants**

► Textbook Page 47

- Which one of the following belongs to the process of secretion? (Comprehension)

Ⓐ Blood	Ⓑ Hormone
Ⓑ Urine	Ⓐ Vapour
 - Co-ordination includes —. (Comprehension)

Ⓐ flowering	Ⓑ germination
Ⓓ growth	Ⓐ all the above
 - What is hormone? (Knowledge)

Ⓐ A biochemical substance	Ⓑ A nitrogen waste
Ⓒ A biproduct	Ⓐ An electromagnetic wave
 - Signaling in human body relates to —. (Application)

i. blood	ii. hormone
iii. neurone	
 - Co-ordination in plants includes —. (Knowledge)

i. dormance	ii. locomotion
iii. germination	
- Which one is correct?**
- Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii
 - Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii

6. Plant physiology is influenced by —.

(Comprehension)

- | | |
|--------------|-----------|
| i. hormones | ii. light |
| iii. climate | |

Which one is correct?

- d** Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii

7. Growth inhibiting hormones —. (Knowledge)

- | | |
|--------------------|--------------|
| i. cytokinin | ii. ethylene |
| iii. abscisic acid | |

Which one is correct?

- c** Ⓐ i & ii Ⓑ i & iii Ⓒ ii & iii Ⓓ i, ii & iii

8. Which one of the following helps to overcome dormancy of seeds? (Comprehension) [DB '19]

- | | |
|------------|---------------|
| Ⓐ Auxin | Ⓑ Florigen |
| Ⓓ Ethylene | Ⓐ Gibberellin |

9. Which prevents the process of abscission of fruits? (Knowledge) [RB '19]

- | | |
|------------|---------------|
| Ⓐ Ethylene | Ⓑ Cytokinins |
| Ⓒ Auxin | Ⓓ Gibberellin |

10. Where do plants produce the florigen hormone? (Knowledge) [RB '19]

- | | |
|---------------|-----------------|
| Ⓐ In the root | Ⓑ In the stem |
| Ⓒ In the leaf | Ⓓ In the flower |

11. Which hormone is present in fruits, flowers, seeds, leaves and roots? (Knowledge) [JB '19]

- | | |
|------------|---------------|
| Ⓐ Auxin | Ⓑ Gibberellin |
| Ⓒ Ethylene | Ⓓ Cytokinins |

- 12.** Which hormone helps to heal wounds of plants? (Knowledge) [CB '19]
 @ Florigen ⑤ Ethylene
 ⚡ ⚡ Gibberellin ④ Indole acetic acid
- 13.** Applicable for florigen — (Comprehension) [CB '19]
 i. Synthesized in leaves
 ii. helps to transform buds into flower buds
 iii. flower is produced in plants
 Which one is correct?
 ⚡ ⚡ i & ii ⑤ i & iii ⚡ ii & iii ⚡ i, ii & iii
- 14.** Ethylene in plants—. (Knowledge) [CtgB '19]
 i. prevent growth
 ii. produce flower
 iii. brake the dormancy of buds
 Which one is correct?
 ⚡ ⚡ i & ii ⑤ i & iii ⚡ ii & iii ⚡ i, ii & iii
- 15.** Where do plants produce the florigen hormone? (Knowledge) [CtgB '19]
 ⚡ In the root ⑤ In the stem
 ⚡ In the leaf ④ In the flower
- 16.** Which one is the growth retarding agents hormone? (Knowledge) [SB '19]
 ⚡ Auxin ⑤ Gibberellin
 ⚡ ⚡ Ethylene ④ Cytokinin
- 17.** Which one is responsible for falling mango? (Knowledge) [DjB '19]
 ⚡ Auxin ⑤ Gibberellin
 ⚡ ⚡ Ethylene ④ Cytokinin
- Read the stem and answer the questions No. 18 and 19 :
 Mr. Karim has a fruit shop. He uses one kind of chemical to ripen green fruits. [DjB '19]
- 18.** What is the name of the chemical? (Application)
 ⚡ Auxin ⑤ Ethylene
 ⚡ ⚡ Gibberellins ④ Abscisic acid
- 19.** The characteristic of this chemical is— (Knowledge)
 i. root grow up in cutting
 ii. found in leaves and roots .
 iii. seedling gives rise to the stem of the tree
 Which one is correct?
 ⚡ ⚡ i & ii ⑤ i & iii ⚡ ii & iii ⚡ i, ii & iii
- 20.** Which hormone is synthesized in leaves? (Knowledge) [BB '19]
 ⚡ Auxin ⑤ Ethylene
 ⚡ ⚡ Florigen ④ Gibberelin
- 21.** Which one of the following helps in ripening fruit? (Knowledge) [DB '18]
 ⚡ Auxin ⑤ Jibberellin
 ⚡ ⚡ Ethylene ④ Florigen
- 22.** Which one is plant of smaller days? (Comprehension) [DB '18]
 ⚡ ⚡ Chandramollika ⑤ Sunflower
 ⚡ ⚡ Rose ④ Jaba

- 23.** Gibberellin hormone—. (Comprehension) [RB '18].
 i. remain in growing parts of leaves
 ii. control immatured abscission of fruits
 iii. applied in small plant
 Which one of the following is correct?
 ⚡ ⚡ i & ii ⑤ i & iii
 ⚡ ⚡ ii & iii ⚡ i, ii & iii
- 24.** In which place florigen is formed? (Knowledge) [RB '18]
 ⚡ Root ⑤ Stem
 ⚡ ⚡ Leaves ④ Flower
- 25.** Which is used to prevent immature falling of mangoes from tree? (Comprehension) [JB '18]
 ⚡ Ethylene ⑤ Auxin
 ⚡ ⚡ Gibberellins ④ Cytokinins
- 26.** Use of Auxin in plants—. (Comprehension) [BB '18]
 i. roots develop in the cutting
 ii. inhibits the process of abscission of fruits
 iii. overcomes the dormancy of seeds
 Which one of the following is correct?
 ⚡ ⚡ i & ii ⑤ ii & iii
 ⚡ ⚡ i & iii ⚡ i, ii & iii
- 27.** Which one prevents abscission of fruits? (Knowledge) [DjB '18]
 ⚡ Florigen ⑤ Gibberellins
 ⚡ ⚡ Auxin ④ Ethylene
- 28.** Which of the folowing hormone is present in the fruit, flower and seed of a plant? (Comprehension) [SB '17]
 ⚡ Auxin ⑤ Gibberellins
 ⚡ ⚡ Florigen ④ Ethylene
- 29.** Application of which phytohormone delayed abscission of fruits? (Higher ability) [Rajuk Uttara Model College, Dhaka]
 ⚡ Auxin ⑤ Ethylene
 ⚡ ⚡ Gibberellin ④ Cytokinin
- 30.** Deformed seedling are formed due to effect of which one? (Knowledge) [Rajuk Uttara Model College, Dhaka]
 ⚡ Cytokinin ⑤ Gibberellin
 ⚡ ⚡ Ethyene ④ Indole acetic acid
-  Lesson 4–5 : Nervous System ► Textbook Page 49
- 31.** The heart, the lung and the secretory glands are controlled by —. (Knowledge)
 ⚡ the central nervous system (CNS)
 ⚡ the peripheral nervous system (PNS)
 ⚡ the autonomic nervous system (ANS)
 ⚡ all the above
- Read the passage below and answer to the following question numbers 32 and 33 :
 Mr Raihan is a doctor. He earns a lot. But he always undergoes a strain because his only son Tapu is an autist by birth. Tapu is running twelve. He has no physical disorder but he is devoid of senses belonging to shame, understanding, conversation disorder, etc. The only thing he can do well is drawing pictures.

32. What disorder has Tapu been suffering from? (Application)
 ① psychiatric disorder
 ② neurological disorder
 ③ cardiae disorder
 ④ hormonal disorder

33. The capabilities Tapu has not lost—.
 (Comprehension)

- i. vision ii. hearing
 iii. respiration

Which one is correct?

- ④ ① i & ii ⑤ i & iii ⑥ ii & iii ⑦ i, ii & iii
 34. By which impulse of nerve is transferred from one nerve cell to another nerve cell?
 (Comprehension) [RB '18]

- ⑧ Synapse ⑨ Axon
 ⑩ Dendron ⑪ Dendrite

35. Which of the following does awaken the feeling of vision of the brain? (Knowledge) [CtgB '18]

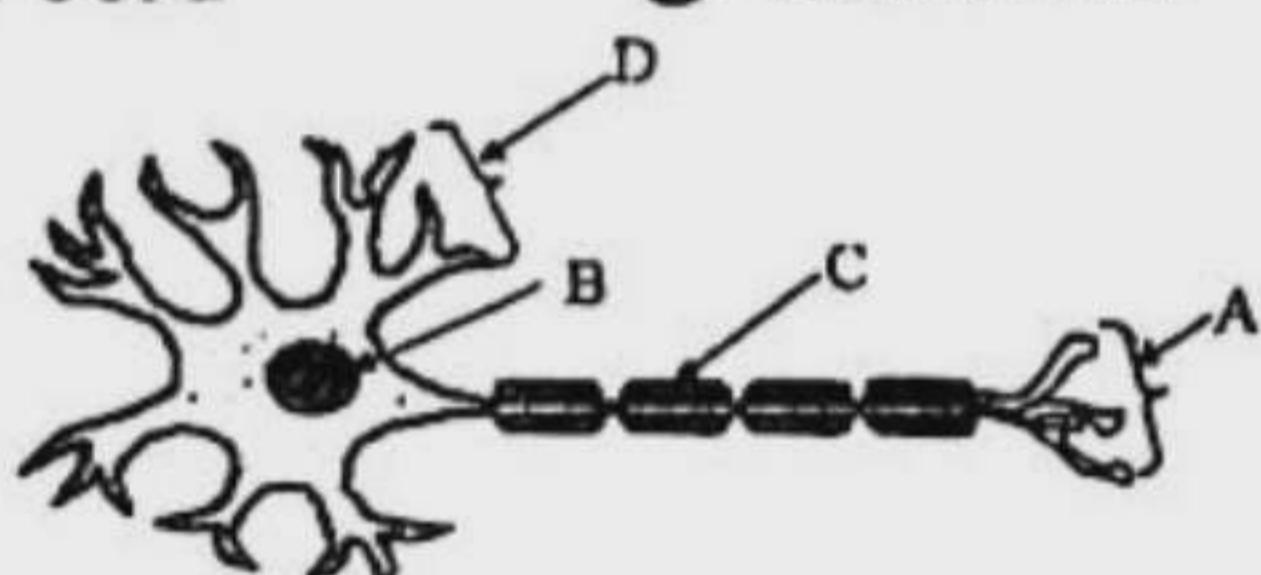
- ⑫ Retina ⑬ Iris
 ⑭ Choroid ⑮ Sclera

36. How many parts does the central nervous system have? (Knowledge) [DB '17]

- ⑯ Five ⑰ Four ⑱ Three ⑲ Two

37. To co-ordinate the activities of the different organ system of the body is the main function of what? (Comprehension) [SB '17]

- ⑳ Nervous system ㉑ Nerve cell
 ㉒ Spinal cord ㉓ Cerebrum



Answer the question No. 38 and 39 in the light of above picture :

38. Which part is used to add one neurone to another? (Application) [DB '16]

- ㉔ ㉕ D ㉖ C ㉗ B ㉘ A

39. In the above picture B is —. (Comprehension) [DB '16]

- i. round, oval or star shaped
 ii. composed of cell membrane, cytoplasm and nucleus
 iii. two types

Which one is correct?

- ㉙ ㉚ i & ii ㉛ ii & iii ㉜ i, ii & iii ㉝ i & iii
 40. Which one is the longest cell of the human body? (Knowledge) [RB '16]

- ㉞ Neurone ㉟ Dendron
 ㉟ Axon ㉞ Cell body

41. Why neurone cell can not divide? (Knowledge) [JB '16]

- ㉞ No mitochondria ㉟ No centriole
 ㉟ No nucleus ㉞ No centromere

42. Which one is absent in neurone cell? (Knowledge) [SB '16]

- ㉟ Cell membrane ㉟ Cytoplasm
 ㉛ Nucleus ㉟ Centriole

43. Autonomic nervous system maintain and control the activity of—(Knowledge)

[Rajuk Uttara Model College, Dhaka]

- i. eye
 ii. lung
 iii. secretary gland

Which one is correct?

- ㉛ ㉟ i & ii ㉟ i & iii ㉜ ii & iii ㉝ i, ii & iii
 44. Which one transmits the impulse from afferent neurones of efferent neurones? (Knowledge) [Ideal School & College, Dhaka]

- ㉟ Synapses ㉟ interneurones
 ㉛ internal exchange ㉝ Sensory nerve

Lesson 6-7 : Brain

► Textbook Page 51

45. What is the largest part of the brain? (Knowledge)

- ㉟ Cerebrum ㉟ Cerebellum
 ㉛ Pons ㉟ Medulla

46. Which part of the brain remains almost in a hanging position? (Knowledge)

- ㉟ Medulla ㉟ Pons
 ㉛ Diencephalon ㉟ Cerebellum

47. Which part of the brain regulates adjustment with weather condition? (Knowledge)

- ㉟ lower cerebrum ㉟ upper cerebrum
 ㉛ midbrain

- ㉛ the whole temporal lobe

Read the passage below and answer to the following question numbers 48 to 51 :

Tahsan is a boy of ten. He dreamt a horrifying dream a week ago. He got up instantly and was trembling. He called his mother in a broken voice. His mother got up and got afraid that her son was palpitating also. He was all right within an hour but could not sleep well for the whole week.

48. The passage refers to —. (Comprehension)

- i. medulla ii. cerebellum
 iii. cerebrum

Which one is correct?

- ㉛ ㉟ i & ii ㉟ i & iii ㉜ ii & iii ㉝ i, ii & iii
 49. That Tahsan could not sleep well for the whole week is a matter of the —. (Higher ability)

- ㉟ upper cerebrum ㉟ lower cerebrum
 ㉛ midbrain ㉟ medulla

50. Which part of the brain was responsible for Tahsan's palpitation? (Application)

- ㉟ Medulla ㉟ Pons
 ㉛ Diencephalon ㉟ Thalamus



Science

51. The emotional aspects regulated by the part of the brain which is responsible for Tahsan's sleep disorder —. (Higher ability)
 i. anger ii. fear
 iii. shame
 Which one is correct?
 (a) (i) & (ii) (b) (i) & (iii) (c) (ii) & (iii) (d) (i), (ii) & (iii)
52. Which is the lower parts of the main part of human brain? (Knowledge) [R.B.-'19]
 (a) Thalamus and Pons
 (b) Medulla and Pons
 (c) Thalamus and Hypothalamus
 (d) Hypothalamus and Medulla
53. Hind brain—. (Knowledge) [CB '19]
 i. retains the balance of the body
 ii. controls movement
 iii. preserves heat
 Which one is correct?
 (a) (i) & (ii) (b) (i) & (iii) (c) (ii) & (iii) (d) (i), (ii) & (iii)
54. Which of the following is called the stalk of the Brain? (Knowledge) [Ctg.B.-'19]
 (a) Pons (b) Cerebellum
 (c) Medulla (d) Thalamus
55. Which is the lower parts of the main part of human brain? (Knowledge) [Ctg.B.-'19]
 (a) Thalamus and pons
 (b) Medulla and pons
 (c) Thalamus and hypothalamus
 (d) Hypothalamus and Medulla
56. Which part of the brain controls the respiration? (Knowledge) [S.B.-'19]
 (a) Cerebellum (b) Cerebrum
 (c) Pons (d) Medulla
57. Which is known as the connector of brain? (Knowledge) [B.B.-'19]
 (a) Medulla (b) Pons
 (c) Cerebellum (d) Cerebrum
58. Which one maintains the balance of the body? (Knowledge) [JB '18]
 (a) Carebrum (b) Mid brain
 (c) Hind brain (d) Medulla
59. The stalk of the brain is —. (Comprehension) [SB '18]
 (a) Mid brain (b) Cerebellum
 (c) Pons (d) Medulla
- See the following figure and answer the questions No. 60 and 61 :

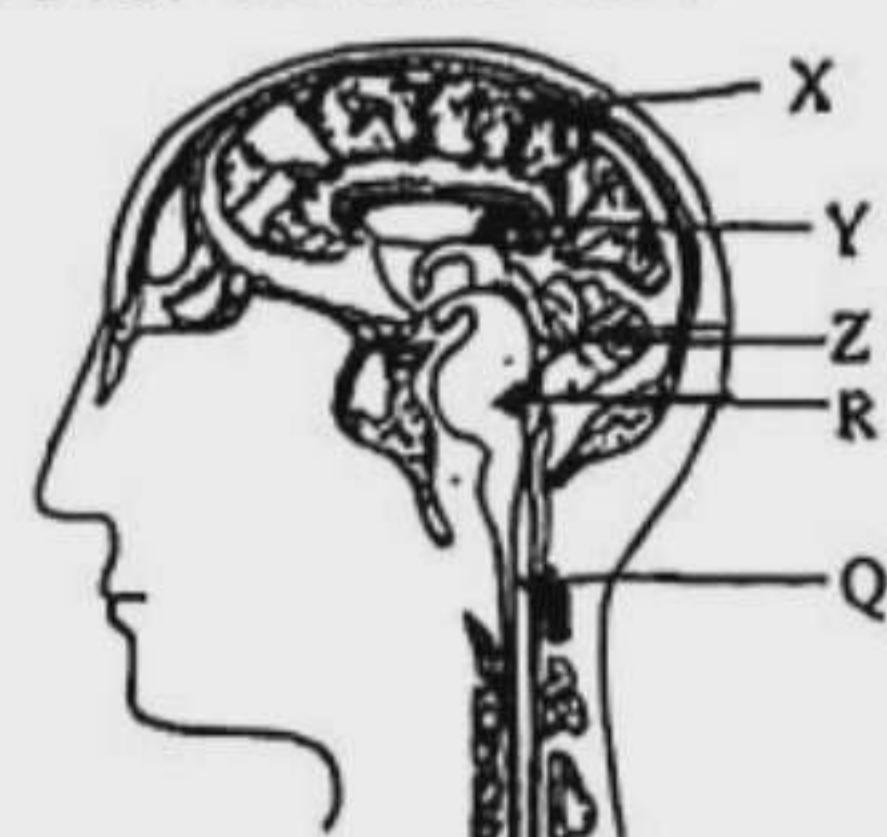
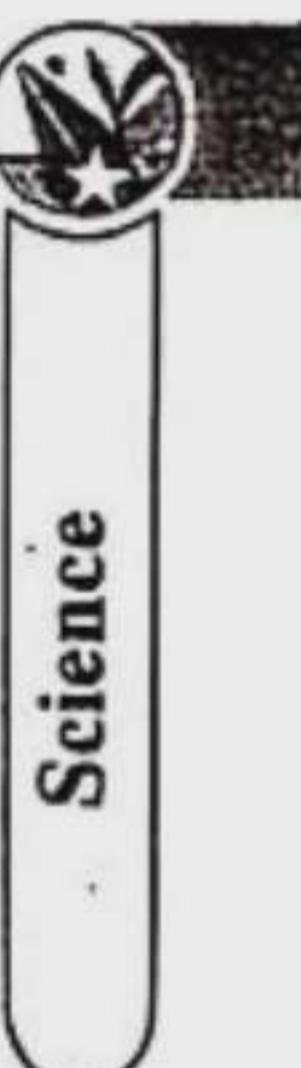
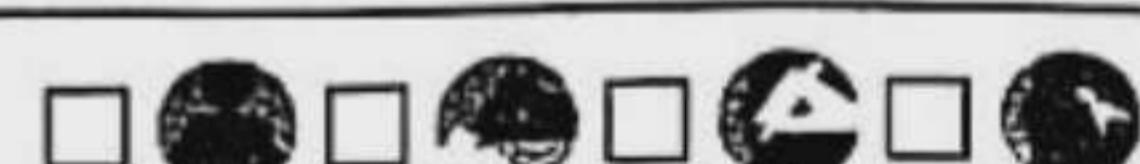


Fig: A

60. Which one is the pons in the figure? (Application) [DjB '16]
 (c) (a) Y (b) Z (c) R (d) Q
61. In the figure 'A' here 'X' —. (Comprehension) [DjB '16]
 i. is the stalk of the brain
 ii. controls the temperature regulation
 iii. maintains the balance of body
 Which one is correct?
 (d) (a) ii (b) iii (c) i & ii (d) ii & iii
62. Which one is called 'stalk of the brain'? (Knowledge) [Rajuk Uttara Model College, Dhaka]
 (a) Pons (b) Cerebrum
 (d) Cerebellum (d) Medulla oblongata
63. Which part of human brain acts as center for auditory and visual reflexes? (Knowledge) [Rajuk Uttara Model College, Dhaka]
 (a) Fore brain (b) Mid brain
 (b) Hind brain (d) Pons
- Lesson 8–10 : Spinal Cord** ▶ Textbook Page 52
- Read the following stem and answer the questions No. 64 and 65 :
 Recently Prova has learnt to ride a bicycle. She became tired after long cycling. Returning home, she sat to read and fell asleep. Elder sister Preema made a fun and smoothy pricks a pin in her hand. Unknownly she withdrew her hand.
64. Which part of brain works for Prova's cycling? (Application) [CB '17]
 (a) Cerebrum (b) Mid brain
 (c) Hind brain (d) Cerebrum and mid brain
65. There relation with withdrawal of Provas hand —. (Comprehension) [CB '17]
 i. interneuronees
 ii. receptor
 iii. brains
 Which one is correct?
 (a) (a) i & ii (b) i & iii (c) ii & iii (d) i, ii & iii
- Lesson 11–12 : Excretory System** ▶ Textbook Page 54
66. What is the functional unit of kidney? (Knowledge)
 (a) Vena cava (b) Ureter
 (c) Nephron (d) Urethra
67. Which of the following organs belongs to the excretory system? (Comprehension)
 (a) Liver (b) Cerebrum
 (c) Medulla (d) Kidney
68. What percentage of carbon dioxide is in the air we breathe off? (Knowledge)
 (a) (a) 4% (b) 5% (c) 5.5% (d) 6.25%

69. What percentage of nitrogen waste is excreted with urine? (Knowledge)
 ⓐ 60% ⓑ 70% ⓒ 80% ⓔ 92%
70. In case of kidney dysfunction/failure, treatments suggested —. (Knowledge)
 i. dialysis
 ii. transplant
 iii. physiotherapy
Which one is correct?
 ⓐ Ⓛ i & ii ⓑ Ⓛ i & iii ⓒ Ⓛ ii & iii ⓔ Ⓛ i, ii & iii
71. Which harmful substance does kidney separate from blood? (Knowledge) [D.B.-'19]
 ⓐ Carbon dioxide ⓑ Carbon monooxide
 ⓒ Urea ⓔ Sweat
72. Which one of the followings is termed as the factory of urine production? (Knowledge) [JB '19]
 ⓐ lung ⓑ Skin
 ⓒ Liver ⓔ Kidney
73. Which percentage of CO_2 exists in breathing out? (Knowledge) [DjB '17]
 ⓐ 3 ⓑ 4 ⓒ 5 ⓔ 6
74. Which one is the main excretory organ of human body? (Comprehension) [RB '16]
 ⓐ Kidney ⓑ Skin ⓒ Lungs ⓔ Nose
75. Which one is the excretory organ of human body? (Comprehension) [CB '16]
 ⓐ lung ⓑ stomach ⓒ liver ⓔ kidney
76. Which one is the urine factory? (Knowledge) [DB '15]
 ⓐ Skin ⓑ Kidney
 ⓒ Liver ⓔ Lungs
77. The exhaled air contains what percentage of carbon dioxide? (Knowledge)
 [Rajuk Uttara Model College, Dhaka]
 ⓐ 4% ⓑ 8% ⓒ 21% ⓔ 80%
78. What percentage of the total nitrogenous excretory products are eliminated as urine? (Knowledge) [Ideal School & College, Dhaka]
 ⓐ 70% ⓑ 60%
 ⓒ 80% ⓔ 90%
79. Urine is—(Knowledge) [Ideal School & College, Dhaka]
 i. transparent
 ii. pale-yellow
 iii. aqueous
Which one is correct?
 ⓐ Ⓛ i & ii ⓑ Ⓛ ii & iii ⓒ Ⓛ i & iii ⓔ Ⓛ i, ii & iii

**Short Q/A****Designed as per topic****► Lesson 1-3: Coordination in Plants**

► Textbook Page 47

Question 1. Mention the stages of the plant life cycle.**Ans.** The stages of the plant life cycle are :

1. Germination, 2. Flowering, 3. Fruit production,
4. Aging, and 5. Dormancy.

Question 2. Write the names of two phytohormones.**Ans.** The names of two phytohormones are :

1. Auxin and 2. Gibberellin.

Question 3. Write the names of two growth-inhibiting phytohormones.**Ans.** The names of two growth-inhibiting phytohormones are :

1. Abscisic acid and 2. Ethylene.

Question 4. What is meant by gaseous phytohormone?**Ans.** Gaseous phytohormones refer to substances that are produced in small amounts in the plant body and are translocated from the site of origin to control various physiological processes, including plant growth. Examples include auxin, gibberellin, ethylene, and abscisic acid.**Question 5. Mention two functions of auxin.****Ans.** Two functions of auxin are :

1. Auxin induces root growth in stem cuttings.
2. It prevents premature fruit drop.

Question 6. Write two importances of gibberellin hormone in plants.**Ans.** Two importances of gibberellin hormone in plants are :

1. Gibberellin promotes the elongation of internodes in plants.
2. It helps to break the dormancy of seeds.

Question 7. Why is ethylene hormone beneficial for plants?**Ans.** Ethylene is a gaseous hormone that breaks the dormancy of seeds and buds, promotes stem elongation in seedlings, and initiates the formation of flowers and fruits. It also helps ripen fruits, which is why it is considered an important hormone for plants.**Question 8. Write two differences between auxin and ethylene.****Ans.** Two differences between auxin and ethylene are :

Auxin	Ethylene
1. Growth promoting phytohormone.	1. Growth inhibitory phytohormone.
2. Prevents premature fruit drop.	2. Accelerates fruit shedding.

Lesson 4 and 5: Nervous System

► Textbook Page 49

Question 9. What is the nervous system? Explain.

Ans. The nervous system is the system in an animal's body that connects different organs, coordinates various biological functions, and responds to stimuli to maintain a relationship with the environment.

Question 10. Mention two functions of the nervous system.

Ans. Two functions of the nervous system are:

1. Carrying stimuli from different parts of the body.
2. Coordinating the functions of different organs in the body.

Question 11. How many parts of a neurone are there and what are they?

Ans. A neurone is composed of two parts: 1. Cell body and 2. Processes. Processes are of two types: (i) Axon and (ii) Dendron.

Question 12. Write two characteristics of the cell body.

Ans. Two characteristics of the cell body are:

1. The cell body is composed of a cell membrane, cytoplasm, and nucleus.
2. It does not contain centrioles.

Question 13. What is an axon? Explain.

Ans. An axon is a long, thread-like structure originating from the cell body. Branches emerge from the end of the axon opposite the cell body. Typically, a neurone has only one axon.

Question 14. What is meant by synapse?

Ans. A synapse is the junction where the axon of one nerve cell connects with the dendrite of another nerve cell. Nerve impulses are transmitted from one nerve cell to another through synapses.

Question 15. Mention two functions of neurones.

Ans. Two functions of neurones are:

1. Maintaining communication between the internal and external environments of an animal's body.
2. Storing memories in the brain.

Question 16. Mention the classification of the nervous system.

Ans. The nervous system is classified into three parts: 1. Central nervous system, 2. Peripheral nervous system, and 3. Autonomic nervous system.

Question 17. What is meant by the autonomic nervous system?

Ans. The autonomic nervous system refers to the system that functions independently and autonomously, without any influence from the brain or spinal cord. Examples include the heart, stomach, lungs, and secretory glands.

Question 18. Write the names of two organs controlled by the autonomic nervous system.

Ans. The names of two organs controlled by the autonomic nervous system are: 1. Lungs and 2. Heart.

Lesson 6 and 7: Brain

► Textbook Page 51

Question 19. Write two characteristics of the brain.

Ans. Two characteristics of the brain are:

1. The brain is the main coordinator of the entire nervous system.
2. The brain is covered by a membrane called meninges.

Question 20. Why is the forebrain called the cerebrum?

Ans. The forebrain or cerebrum is the largest part of the brain. The cerebrum is the center of body movement and every action and feeling. It controls our vision, hearing, smell, thoughts, memory, knowledge, intellect, conscience, and muscle movements. That's why the forebrain is called the cerebrum.

Question 21. Write two functions of the midbrain.

Ans. Two functions of the midbrain are:

1. Maintaining body balance.
2. Controlling speech and movement.

Question 22. How many parts of the hindbrain are there and what are they?

Ans. The hindbrain has three parts:

1. Cerebellum, 2. Pons, and 3. Medulla oblongata.

Question 23. Write two differences between the cerebrum and cerebellum.

Ans. Two differences between the cerebrum and cerebellum are :

Cerebrum	Cerebellum
1. Part of the forebrain	1. Part of the hindbrain
2. Occupies most of the brain	2. Located below the cerebral hemispheres

Question 24. Why is the pons called the connector of the brain?

Ans. The pons is located in front of and below the midbrain in the human body. It connects the cerebrum, midbrain, and hindbrain to the medulla oblongata. That's why the pons is called the connector of the brain.



Lesson 8-10: Spinal Cord ➤ Textbook Page 52

Question 25. How many parts are there in each reflex cycle? Mention them.

Ans. Each reflex cycle has five parts : 1. Receptor organ; 2. Sensory nerve; 3. Reflex center; 4. Motor nerve; 5. Effector organ.

Question 26. Write two differences between the brain and spinal cord.

Ans. Two differences between the brain and spinal cord are :

Brain	Spinal Cord
1. Gray matter is located on the outside	1. Gray matter is located on the inside
2. White matter is located on the inside	2. White matter is located on the outside

Question 27. Why do we withdraw our hand immediately after being pricked by a pin?

Ans. We withdraw our hand immediately after being pricked by a pin because of a reflex action. When our skin is pricked by a pin, several sensory nerves receive the stimulus. This stimulus is transmitted to many motor neurones through interconnected nerve cells. These motor nerves carry the stimulus to the muscles, causing the hand to move away.

Question 28. Why is reflex action called a coordinated activity?

Ans. Each reflex action has five parts : 1. Receptor; 2. Sensory nerve; 3. Reflex center; 4. Motor nerve; and 5. Effector organ. If any of these five parts are missing, the reflex action cannot be performed correctly. That's why reflex action is called a coordinated activity.

Lesson 11 and 12: Excretory System ➤ Textbook Page 54

Question 29. What is excretion? Explain.

Ans. Excretion refers to the system of removing waste products from the body. Various metabolic processes in living organisms produce waste products such as carbon dioxide, urea, uric acid, excess water, and salt. If these substances accumulate in the body, they can be harmful, so they are removed through the process of excretion.

Question 30. Why is it important to remove waste products from the body?

Ans. Waste products are substances that are harmful and unnecessary for the body. Metabolic processes produce harmful substances in the body such as water, carbon dioxide, and urea. If these substances are not regularly removed, they can cause health problems. These harmful substances can accumulate in the body and cause toxicity, which can even lead to death. That's why it is important to remove waste products from the body.

Question 31. Mention the names of the excretory organs in the human body.

Ans. There are three excretory organs in the human body: 1. Lungs, 2. Skin, and 3. Kidneys.

Question 32. Why are kidneys called the main excretory organs?

Ans. Various metabolic processes in the human body produce nitrogenous substances that are harmful and unnecessary for the body. These nitrogenous substances are removed from the body through the kidneys. Eighty percent of the nitrogenous waste products in the body are excreted through urine. That's why kidneys are called the main excretory organs.

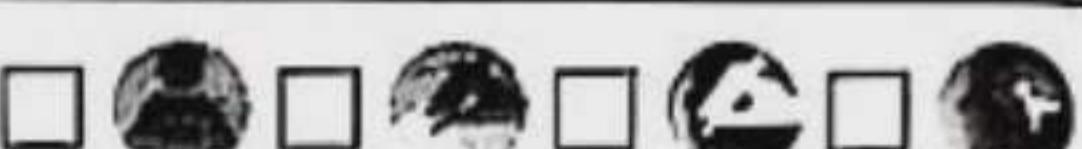
Question 33. Why does a clear mirror appear cloudy when we breathe on it on a cold winter morning?

Ans. A clear mirror appears cloudy when we breathe on it on a cold winter morning. This is because our breath contains carbon dioxide and water vapor. The water vapor forms water droplets on the cold mirror, making it appear cloudy. After some time, the water droplets evaporate from the mirror, and it becomes clear again.

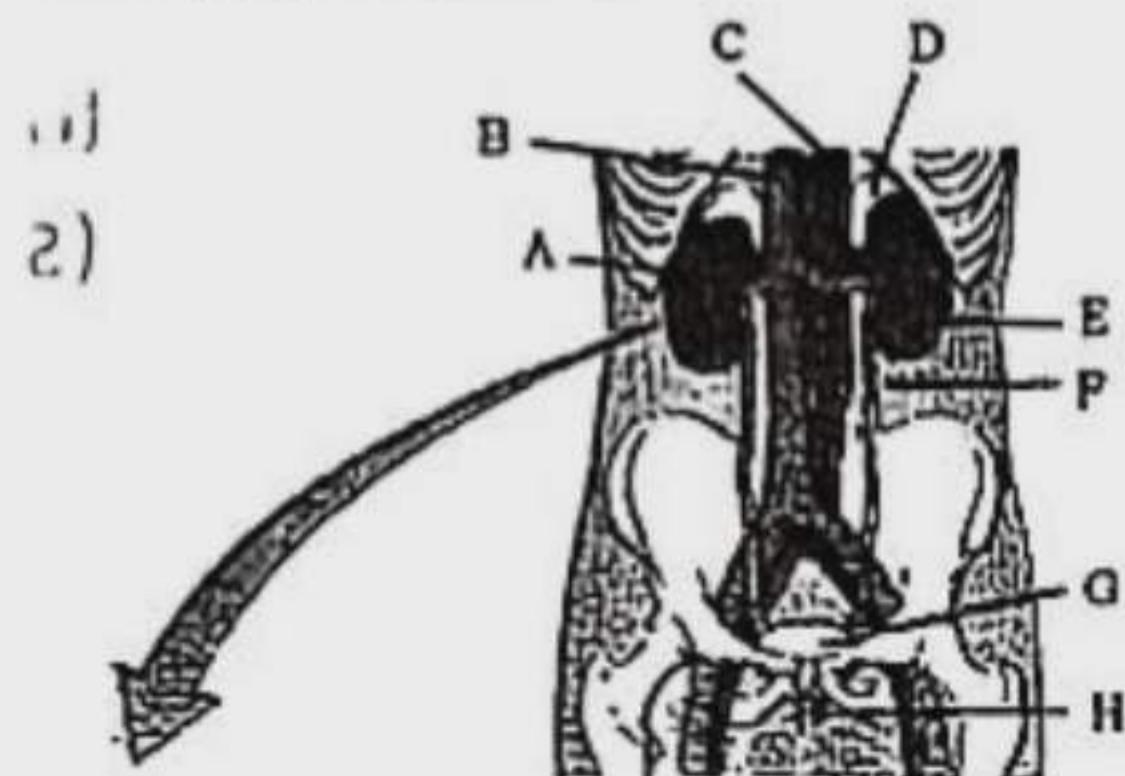
Question 34. Why is the kidney compared to a sieve?

Ans. The liver breaks down excess amino acids in our body to produce nitrogenous waste products such as urea, uric acid, and ammonia. These are harmful to the body. The kidneys filter these harmful substances from the blood and purify it. Because the kidneys filter out waste products like a sieve, they are compared to one.





Ques. 01 Look at the picture below and answer to the following questions :



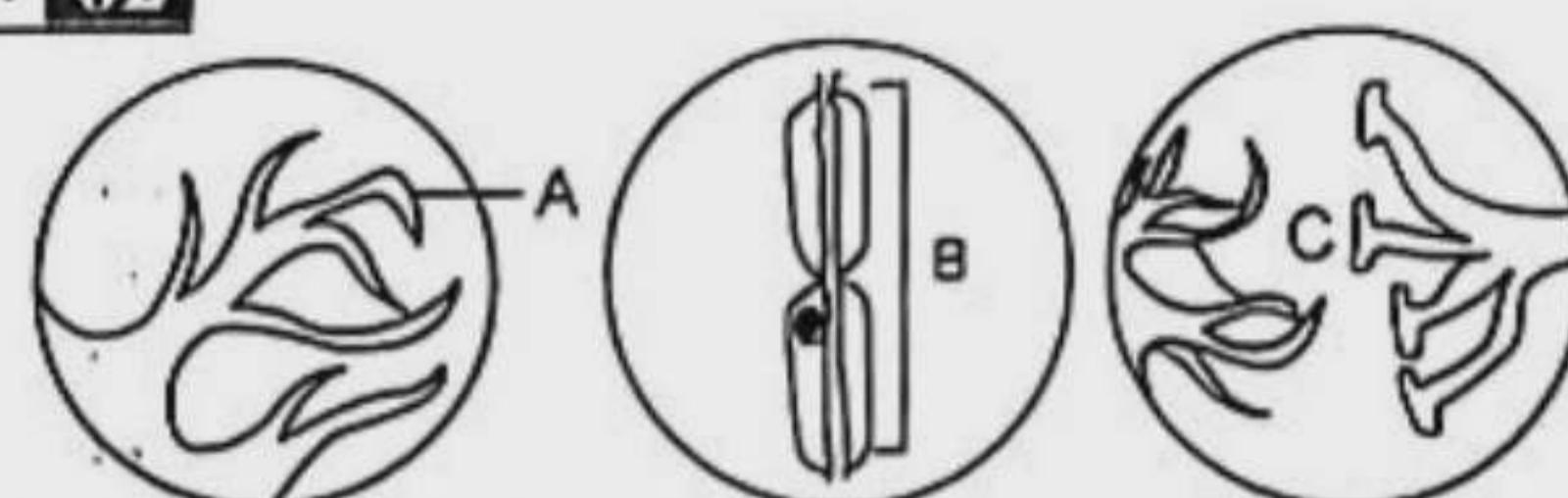
- What the heart and the lung are regulated by? 1
- Explain reflex action. 2
- What system is the picture of? Write the names of the labelled parts from A to H. 3
- If you do not have profound knowledge in neurology, you cannot be a good psychiatrist. Evaluate the statement. 4

Answer to Question No. 01 :

- a The heart and the lung are regulated by the autonomic nervous system.
- b The simplest type of neural circuit is a reflex arc, which begins with a sensory input and ends with a motor output, passing through a sequence of neurones in between. For example, let us consider the withdrawal reflex causing the hand to jerk back after a hot stove is touched.
- c This is a picture of the urinary system.
 A ⇒ Renal artery and vein
 B ⇒ Posterior vena cava
 C ⇒ Aorta D ⇒ Adrenal gland
 E ⇒ Kidney
 F ⇒ Ureter
 G ⇒ Urinary bladder
 H ⇒ Urethra

d I agree on the argument that I cannot be a good psychiatrist if I do not have profound knowledge in neurology (the study of the nervous system). I know that many psychological as well as some physical functionings depend on the nervous system. For example, cerebrum regulates vision, hearing, smelling, thinking, memory, wisdom and conscience. The lower cerebrum regulates anger, fear and shame. We know, anger, fear, shame, thinking, memory—all are psychological aspects, though they are related to neurology. Doctors prescribe clonazepam and sartaline tablets to cure a panic stricken patient. Both the tablets are effective in reducing fear. The centre of fear in the lower cerebrum. As a psychiatrist, I need to know this.

Ques. 02



- What is the cell body of a nerve composed of? 1
- How do we sweat? 2
- State the differences between A and B. 3
- Evaluate the role of C in life. 4

Answer to Question No. 02 :

- a The cell body of neurone is composed of cell membrane, cytoplasm and nucleus.
- b We sweat out excess water, salt and a little amount of carbon dioxide through our skin. It is possible, because of numerous tiny pores in the skin. These pores are in fact hair follicles. Sweat comes out through these hair follicles.
- c Differences between A and B : A and B represents dendrite and axon respectively. Dendrites are the small branched fibrous process around the cell body. There may be a few or no dendrites in a cell body. Axon is the unbranched extended process that originates from the cell body. Usually there is only one axon in a neurone. When the axon of one neurone ends, dendrons of another neurone arise. The adjoining gap between a dendrite and an axon is called synapse.

d C represent neurone. Its role in life is simply great. It is the structural and functional unit of the nervous system. Each neurone sends signals to the next one and so on or even from one part of the body to the other parts. The entire nervous system provides point to point signals while neurones project their axons to specific target areas. Neurones receive stimuli and create proper sensation. Thought, sensation, small, vision, hearing, memory, conception, intellect, movement of muscle—all these mechanisms belong to the regulation of the nervous system consisting of millions of neurones.

Ques. 03 Arman was reading a book attentively. In that time, a mosquito sits on his left hand. He drives it away by moving that hand immediately without moving his eyes from book.

- What is nervous system? 1
- Why neurone is not divided? Explain it. 2
- Draw the figure of the combined act of the nervous process that is mentioned in the stem. 3
- "To response for the mosquito bite is not controlled by Arman's brain?"—Give your logical comment. 4

Answer to Question No. 03 :

a The system of animal body which maintains communication between different organs, coordinates the functions of all other systems and respond to stimuli in order to keep harmony with the environment is called the nervous system.

b The structural and functional unit of nervous system is called the neurone. A neurone is the longest cell of the human body. Neurone have no centriole, So they cannot divide like other cells.

c The nervous process that is mentioned in the stem is reflex action. The combined act of reflex action is drawn below—

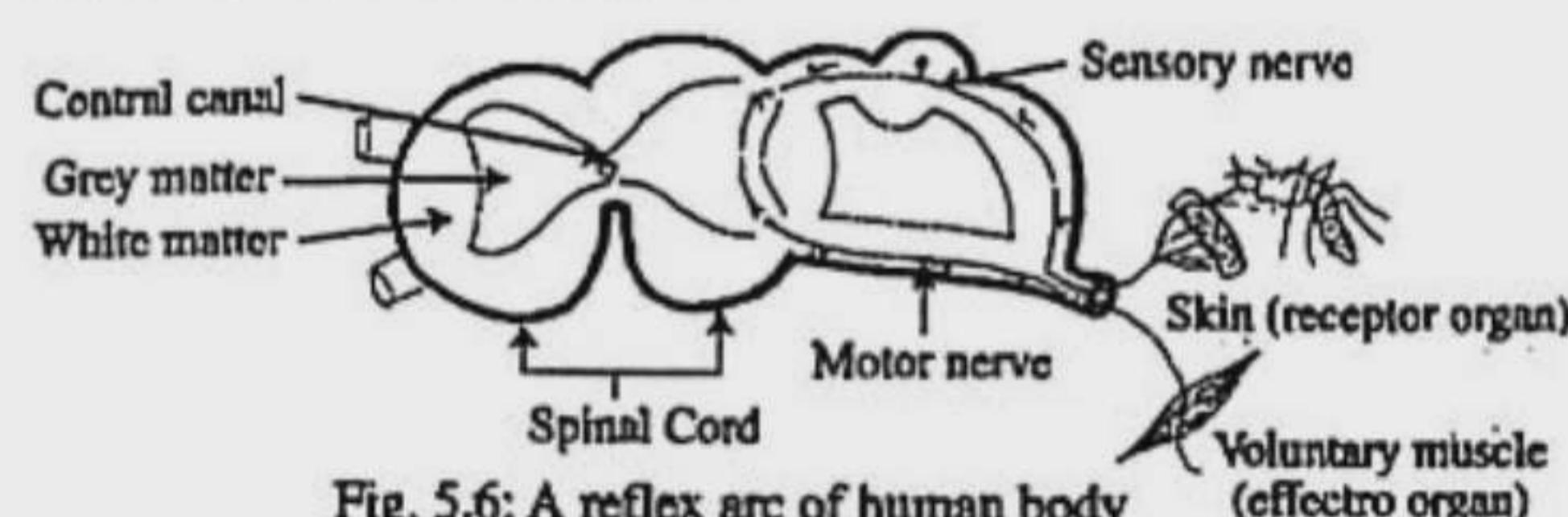


Fig. 5.6: A reflex arc of human body

d To response for the mosquito bite is called reflex action. Reflex action is the consequences of immediate action of nerve impulse. This action is controlled by the spinal cord, not by the brain.

The presence of mosquito on the hand stimulates a sense organ. This sensation travels from the sense organ to the spinal cord through sensory nerve fibres. In response, the central nervous system sends back a message through motor nerve fibres to the muscle of hand, and as a result we drive away or kill the mosquito.

Reflex action occurs automatically (spontaneously) without conscious thought. It may be defined as the inborn, automatic actions of the body which are done without the involvement of thinking or brain. Thus these actions are immediate and spontaneous and may be described as automatic response to stimuli. Reflex actions are usually conveyed through spinal cord by a path called reflex arc. A reflex arc has the following constituents: (1) receptor (sensory organ) (2) sensory (afferent) nerve (3) interneurons (4) motor (efferent) nerve and (5) effector organ.

Ques. 04

- What is brain? 1
- What happens when light of high intensity of torchlight falls on eyes? Explain. 2
- Explain the construction of 'X'. 3
- Analyze the importance of 'Y' in human body. 4

Answer to Question No. 04 :

a Brain is the sole controlling agent of the whole nervous system whose main parts-are cerebrum (fore brain), mid brain and hind brain.

b When light of high intensity of torchlight falls on eyes, eyes get closed. It is due to reflex action. Reflex action occurs automatically (spontaneously) without conscious thought. It may be defined as the inborn, automatic actions of the body which are done without the involvement of brain. Thus these actions are immediate and spontaneous and may be described as automatic response to stimuli.

c 'X' of the stem is nerve cell or neurone. The structural and functional unit of nervous system is the neurone. A neurone is the longest cell of the human body.

A typical neurone is mainly divided into two parts, namely— 1. Cell body and 2. Processes.

- Cell body :** The cell body is the main part of the neurone. The cell body may be of different shapes, for example, round, oval or star-shaped. The cell body is composed of cell membrane, cytoplasm and nucleus. Nerve cells have no centriole, so they cannot divide like other cells.
- Processes :** The branched, tree like structures that extend from the cell body are called processes. The processes are of two types, such as-(a) Axon and (b) Dendron.

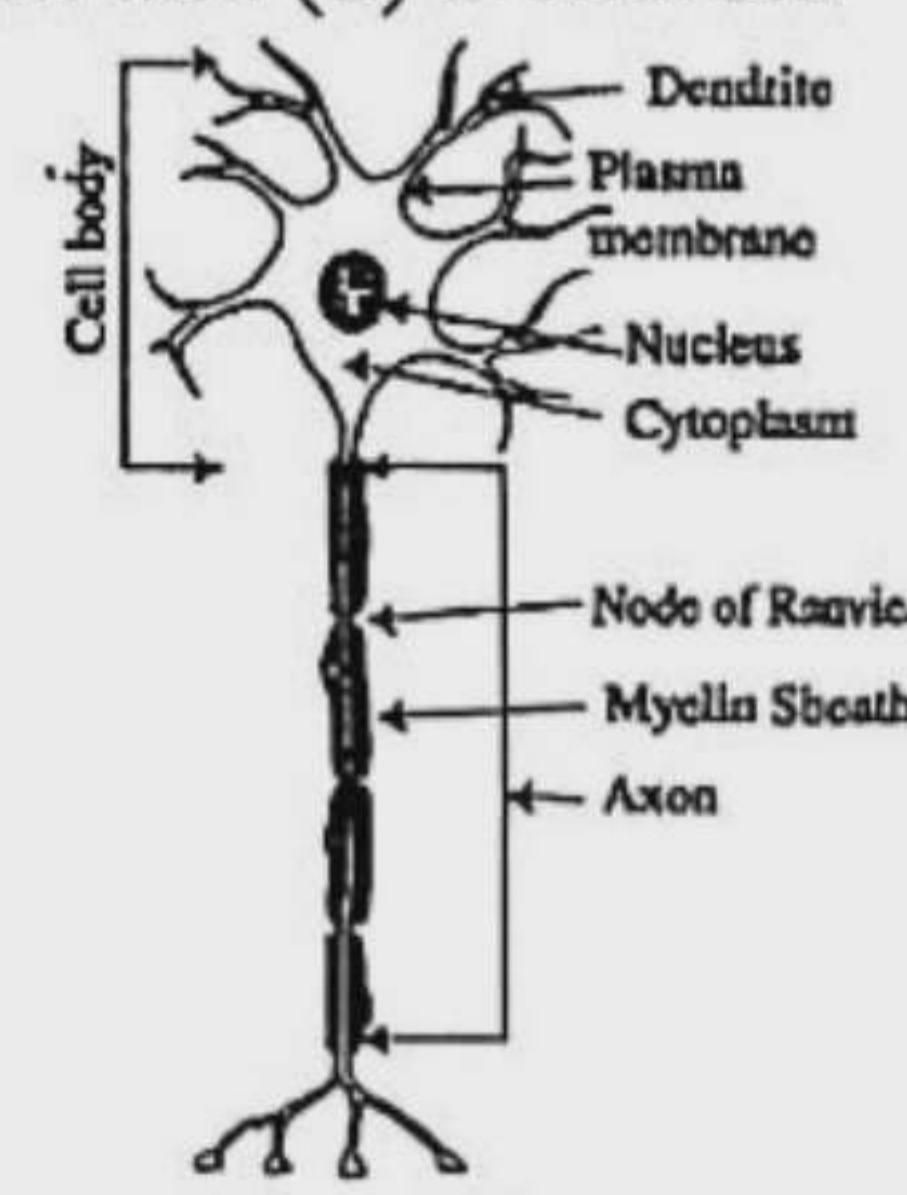


Fig. : Neurone

d 'Y' of stem is of kidney.

Kidney is termed as the factory of urine production. They lie at the back of the abdominal cavity, one on each side of the vertebral column just below the diaphragm. Kidney acts as filter. During the breakdown of excess amino acids in the liver, nitrogenous waste products like ammonia, urea and uric acid are formed. These are harmful for the body. The kidney extract these harmful substance from blood, and excrete it from the body as part of a liquid called urine. Urine is a transparent, pale-yellow coloured aqueous fluid.



Urine is retained in the urinary bladder for a particular period of time. During filling of the urine, the urinary bladder expands. When sufficient pressure is mounted inside the bladder, a spontaneous nervous activity (reflex) is initiated so that the smooth muscles of the bladder wall contract and the urethral sphincters are relaxed. As a result, the urine flows out from the bladder through the urethra.

- Ques. 05** During stitching katha, a needle pricks the skin of Mina's hand. She makes a sound 'uff'. Her elder brother said, "Be careful".
- What is phytohormone? 1
 - Why the stem of plants bend towards the source of light? 2
 - Explain the incident of making sound by Mina. 3
 - How the speech of Mina's brother generate by a special system? Analyze. 4

© Barishal Board 2019

Answer to Question No. 05 :

- a Phytohormone is organic compound which control all physio-chemical activity of the plant.
- b The stem of plants bend towards the source of light because of phototropism of plants. Stem and leaf stalks respond by growing towards the light. They bend so that the leaves face the light.
- c The incident of making sound by Mina (according to stem) is Reflex action.

Reflex action occurs automatically (spontaneously) without conscious thought. It may be defined as the inborn, automatic actions of the body which are done without the involvement of thinking or brain. Thus these actions are immediate and spontaneous and may be described as automatic response to stimuli. Reflex actions are usually conveyed through spinal cord by a path called reflex arc. A reflex arc has the following constituents: (1) receptor (sensory organ) (2) sensory (afferent) nerve (3) interneurons (4) motor (efferent) nerve and (5) effector organ.

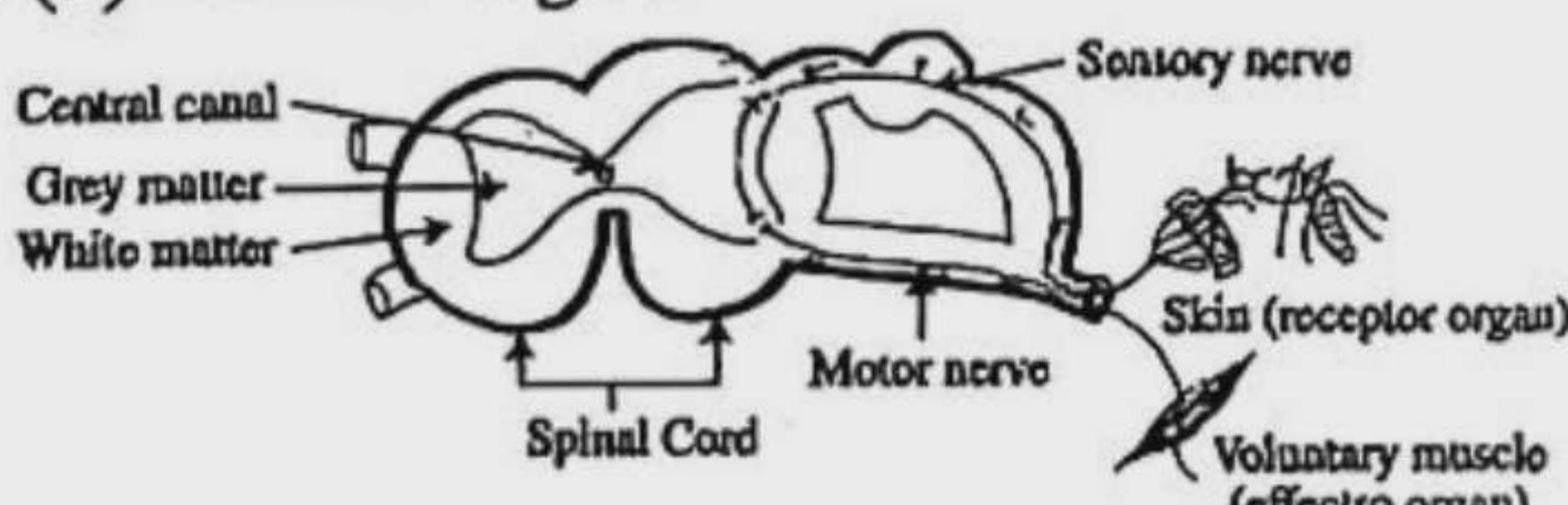


Fig : A reflex arc of human body

d The speech of Mina's brother generate by a nervous system. Hind brain controls speech and movement of body.

In different organs, there is an assemblage of various functions of numerous cells. To coordinate with these functions and to keep harmony with the environment body needs quick coordinating system. Such as someone's evil news makes you cry but good news makes you cheerful, your good result in examination makes you delightful. Various stimuli provokes all these activities. To carry stimuli from different parts of the body, coordinate the activities of the different organ systems of the body and to keep harmony with the environment are the main functions of nervous system.

The system of animal body which maintains communication between different organs, coordinates the functions of all other systems and respond to stimuli in order to keep harmony with the environment is called the nervous system. Brain is the main part of the nervous system. The brain of man is the most developed one amongst all animals and man is therefore known as the best creature of the universe. Brain is formed by numerous specialized cells called neurone or nerve cell.

Ques. 06



- What is called excretory system? 1
- Why does the fruit fall earlier? 2
- What role does the fig play in transmitting impulses in human body? Explain. 3
- The structure of the cell of the stem is different from the structure of the other cells. — Analyze with logic. 4

Answe to Question No. 06 :

- a The system which performs the function of excretion is called excretory system.
- b Fruits fall earlier due to deficiency of auxin. Auxin is an important phytohormone of plants. Phytohormones are the natural growth substances, which are usually synthesized in one part of a plant and are translocated to other parts where they exert their influences. Auxin plays an important role in inhibiting the fruit fall earlier.

c Fig. of the stem represents neurone or nerve cell. The structural and functional unit of nervous system is the neurone.

In transmission of stimuli within human body, the significance of neurons or nerve cells are simply great. Each nerve cell send signals to the others and so on or even from one part of the body to the others. The nervous system is composed of millions of nerve cells. The system provides 'point to point' signals — neurons project their axons to specific target areas. The nervous system controls the body. It coordinates the activities of different organs of the body. Each unit of the nervous system (neurone) receives stimuli and creates proper sensation. Thought, sensation, smell, vision, hearing, memory, conception, intellect, movement of muscle— all belong to the regulation of the nervous system consisting of millions of nerve cells.

d The figure shown in the stem is a neurone, the longest cell of human body. It is the structural and functional unit of nervous system. On the other hand, living bodies are composed of innumerable normal cells other than neurons. The structural differences between normal cell and neurone is described below—

Neurone	Normal Cells
1. Neurone is divided into two parts, namely cell body and processes.	1. There have no processes or branches in normal cells.
2. They do not have centriole. So, they do not divide like normal cell.	2. They have centriole. So, cell division takes place in them.
3. Ribosome, lysosome, endoplasmic reticulum, cell vacuole, chromosome etc. cellular organelle are absent in neurone.	3. Ribosome, lysosome, endoplasmic reticulum, cell vacuole, chromosome, etc. cellular organelle are present.

So, it can be said that normal cells and neurons are distinct cells in consideration of their structures and functions.

- Ques. 07** Ruma lives in a village. Keeping a pencil obliquely in the water in glass, she observes that the pencil is appearing smaller and thicker. Suddenly a hand falls on the warmed chimney of the hurricane. She removes her hand from there.
- What is phytohormone? 1
 - What is the reason of not reflecting after the light entering into eye? 2
 - Explain the reason of the above mentioned incident which observed by Ruma. 3
 - Whether the neurological process related with the later behaviour of Ruma in the stem? Give logic in support of your answer. 4

Answer to Question No. 07 :

a Phytohormone is an organic compound which regulates the growth and development, origin of different organs of plants and physio-chemical activities of plants.

b There is a black membrane covering the body of sclera of eye. It is called choroid. Because of its blackness, the light entering the eye is not reflected.

c The incident observed by Ruma is refraction of light. Due to refraction of light, a pencil kept in the glass water looks shorter, thicker and broken along the bottom of the glass. When a pencil is kept obliquely in the water in glass, light from the immersed part of the pencil reaches us after refraction. Before the light from the immersed part of the pencil reaches our eye it passes from the denser transparent medium water to rarer medium air and is deflected in the surface. The apparent bending of the pencil gives evidence that light is refracted at the surface between the two different medias. Thus bending of the light path at the surface separating two different medias occurs because, the velocity of light is different in different media. It is to be noted that if light falls normally on the surface, there will be no change of direction of light.



Refraction of light.

d The later behaviour of Ruma in the stem is— Suddenly her hand fall on the warmed chimney of the hurricane and she removes her hand from there. This behaviour is related to the neurological phenomenon and it is called reflex action.

Reflex action is the consequences of immediate action of nerve impulse. The touch of warm on the hand stimulates a sense organ. This sensation travels from the sense organ to the spinal cord through sensory nerve fibres. In response, the central nervous system sends back a message through motor nerve to the muscle of hand and as a result we remove our hand.

Immediately after the 'touch of warm in' the skin of our hand, the sensory organ (receptor) perceives the stimuli of pain; this painful stimuli passes into the spinal cord through sensory (spinal) nerves; interneurons transmits the impulse from afferent neurones to efferent neurones; the motor nerve carries the message from spinal cord to the muscles; the effector organ shows response to the stimuli and consequently muscle contracts and we withdraw our hand from painful stimuli.



Ques. 08 Ruma lives in village. She put a pencil inclined way in a glass filled with water and observes that the pencil looks small and thick. Suddenly her hand falls upon on the hot chimney of hurricane, instantly she moves away her hand from the chimney.

- What is called phytohormone? 1
- What is the reason for not light reflection inside the eye? 2
- Explain the reason of the incident that Ruma observed. 3
- Is Ruma's last activities involved with her nervous system? Argue in favour of your answer. 4

• Jashore Board 2018

Answer to Question No. 08 :

- Phytohormone is organic compound which controls all the physio-chemical activity of the plant.
- See Question No. 04(b) Answer
- See Question No. 04(c) Answer
- See Question No. 04(d) Answer

Ques. 09 Munni live in village. She put a pencil inclined way in a glass filled with water and observe that the pencil looks small and thick. Suddenly her hand fall upon on the hot chimney of hurricane, instantly she move away her hand form the chinmey.

- What is called critical angle? 1
- What is the reason for not light reflection inside the eye? 2
- Explain the reason of the incident that Munni observed. 3
- Is it involved Munni's last activities with her nervous system? Give logic. 4

• Cumilla Board 2018

Answer to Question No. 09 :

- Critical angle is the angle of incidence in the dense medium for which angle of refraction in less dense medium becomes 90° .
- Choroid is black membrane covering the inner body of sclera. Because of its blackness, the light entering the eye is not reflected.

c Munni observed that pencils looks small and thick. The reason behind it is discussed below — When a pencil is immersed obliquely in water and looked at from above, the part of the pencil that is under water will appear smaller, thicker and raised upwards. In fact it appears so because of refraction. As it can be seen in the figure, light is refracted from the denser medium



Fig : Refraction of light

water into the rarer medium air and enters our eyes. Every part of the immersed pencil is raised upwards. As a result the pencil appears lifted upwards and reduced in lengths and increased in diameter.

d Yes Munni's last activities are involved with her nervous system. The central nervous system consists of brain and spinal cord. The cerebrum is the main part of human brain. It consists of two incompletely divided lobes, the right and the left cerebral hemisphere (lobe). The two hemispheres are connected to each other by broad tract of nerve fibres. The human cerebrum is comparatively more developed than in any other animals. The exterior surface of the cerebrum, the cerebral cortex, is a convoluted, or folded, greyish layer of cell bodies or neurones known as the grey matter. The grey matter covers an underlying mass of fibres or axon called the white matter. Only nerve fibres or axons are present here and no cell body is found. As the nerve fibres are white in colour, the layer beneath the cortex is known as white matter. Grey matter has many layers of nerve cells. These nerve cells, by accumulation, forms nerve centre in different parts of the cerebrum. These centre acts as functional site for specialized activities. Vision, hearing, smell, thinking, memory, knowledge, conscience, intelligence, and movement of muscles are controlled by these nerve centre.

The lower part of the cerebrum constitute the thalamus and hypothalamus. These are the collection of grey matter. Anger, shame, hot, cold, sleep, temperature regulation and movement of the body are controlled by this region.

- Ques. 10** The children fear from fire. And it feel pain to push pin. Its give up unwanted waste by stool and urine. These are occur reflexive system.
- What is cerebellum? 1
 - Explain what type of hormone is ethylene. 2
 - How does the system mentioned in the stem act? 3
 - Explain the action mentioned in the stem. 4

• Dinajpur Board 2018

Answer to Question No. 10 :

a Cerebellum is a part of hind brain which is located at the back of the brain and behind pons.

b Ethylene is a gaseous hormone of plants.

This gas has been found to be very significant as it is produced by almost all the fleshy fruits during the process of ripening. For this reason, ethylene is now regarded as a gaseous phytohormone. This hormone is also present in fruits, flowers, seeds, leaves and roots. Ethylene can eliminate the normal geotropic responses of seedlings and consequently deformed seedlings are produced.

c The system mentioned in the stem is reflexive action. Reflex action occurs automatically (spontaneously) without conscious thought. It may be defined as the inborn, automatic actions of the body which are done without the involvement of thinking. Thus these actions are immediate and spontaneous and may be described as automatic response to stimuli. Reflex actions are usually conveyed through spinal cord by a path called reflex arc. A reflex arc has the following constituents: (1) receptor (sensory organ) (2) sensory (afferent) nerve (3) interneurons (4) motor (efferent) nerve and (5) effector organ.

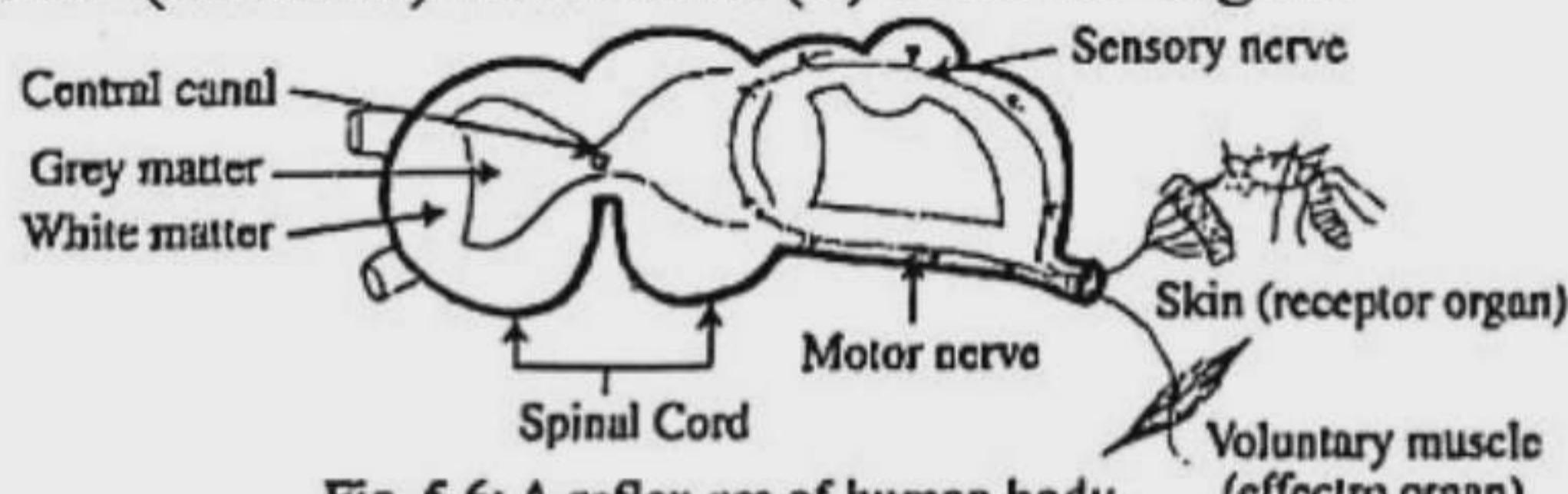


Fig. 5.6: A reflex arc of human body

Immediately after the pin pricks the skin of our hand, the sensory organ (receptor) perceives the stimuli of pain; this painful stimuli passes into the spinal cord through sensory (spinal) nerves; interneurons transmits the impulse from afferent neurones to efferent neurones; the motor nerve carries the message from spinal cord to the muscles; the effector organ shows response to the stimuli and consequently muscle contracts and we withdraw our hand from painful stimuli.

d The action mentioned in the stem is excretion. Excretion is the process by which organism removes harmful, unwanted waste products from the body. Water, carbon dioxide, urea etc. are the waste products of metabolism of man. The regular removal of these waste products are necessary because, if they are accumulated, they would affect the metabolic activities. Moreover, they are toxic and their retention in the body may cause intoxication and even death of the organism.

These waste products are expelled from the body mainly through expelled air, sweat and urine. Lung, skin and kidney are the three main organs of excretion. Lung eliminates carbon dioxide and skin eliminates harmful salt substance from the body. The liquid nitrogenous waste products of the body are excreted through kidney.

Waste products from the body are removed by kidney, skin and lungs. 80% of the total nitrogenous excretory products are eliminated as urine from the body. So, kidney is termed as the main excretory organ of the body. The system which performs the function of excretion is called excretory system.

BD

Ques. 11 Kidney Neuron

Q R

- What is nerve impulse? 1
- What do you mean by tropic movement? 2
- "The organ 'Q' of the stem is the factory of preparing urine."— Explain it. 3
- If the organ 'R' of the stem does not work properly, in that time what type of problems are occurred in the human body? Give your logic. 4

© Rajshahi Board 2017

Answer to Question No. 11 :

a Information, in the form of electrical impulses, flows through the nerve cell is called the nerve impulse.

b The movement of a plant during its growth can be either directional or non-directional. If movement takes place in the direction of the stimulus, it is known as tropic movement. The most common tropic movements are phototropism and geotropism.

c The organ— Q of the stem is kidney.

Kidney is termed as the factory of urine production. They lie at the back of the abdominal cavity, one on each side of the vertebral column just below the diaphragm. Kidney acts as filter. During the breakdown of excess amino acids in the liver, nitrogenous waste products like ammonia, urea and uric acid are formed. These are harmful for the body. The kidney extract these harmful substance from blood, and excrete it from the body as part of a liquid called urine. Urine is a transparent, pale-yellow coloured aqueous fluid. Urine is retained in the urinary bladder for a particular period of time. During filling of the urine, the urinary bladder expands. When sufficient pressure is mounted inside the bladder, a spontaneous nervous activity (reflex) is initiated so that the smooth muscles of the bladder wall contract and the urethral sphincters are relaxed. As a result, the urine flows out from the bladder through the urethra.



a The organ 'R' of the stem is neurone. The structural and functional unit of nervous system is the neurone. It is the longest cell of the human body. The system of animal body which maintains communication between different organs, coordinates the functions of all other systems and respond to stimuli in order to keep harmony with the environment is called the nervous system. Brain is the main part of the nervous system. The brain of man is the most developed one amongst all animals and man is therefore known as the best creature of the universe. Brain is formed by numerous specialized cells called neurone or nerve cell. To carry stimuli, to maintain communications between internal and external environment of the body, coordinate the activities of different organ systems of the body, retain memory and to think and pass instructions for work are the functions of neurone. So, if the organ 'R' of the stem does not work properly, transmission of nerve impulse is hampered. It may cause various problems and nerve disorders such as paralysis, epilepsy, parkinson disease etc.

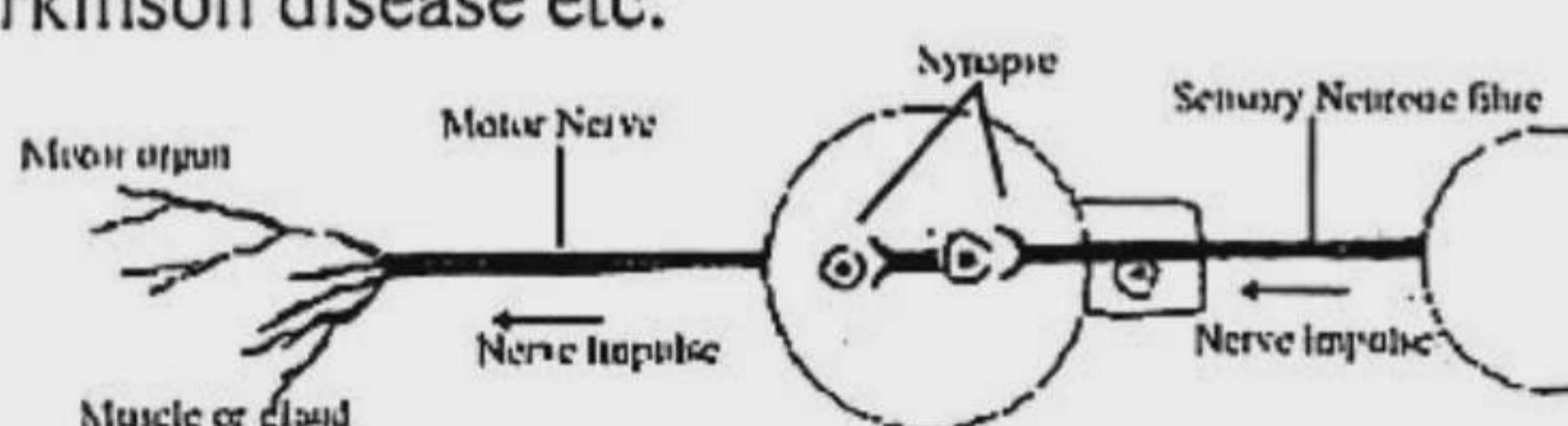


Fig. Flow chart of the transmission of an impulse of the nervous system.

Ques. 12 There are some chemical components like auxin, gibberellin and ethylene etc are considered as the intrinsic secretion of plants. These intrinsic secretions play some important role in growth and development of plants.

- a. What is excretion? 1
- b. What do you mean by synapse? 2
- c. Explain the influences of the first chemical component mentioned in the above stem in plant body. 3
- d. Analyze the last sentence of the above mentioned stem. 4

* Rajuk Uttara Model College, Dhaka

Answer to Question No. 12 :

- a** Excretion is the process by which organism removes harmful, unwanted waste products from the body.
- b** The junction between the two neurones where axon of one neurone ends and the dendrons of another neurone arises known as synapse. Synapses allow information to pass from one neurone to another.

c Different physiological activities of plants, including growth and movement, are performed systematically following some specific orders. One activity does not hamper another activity. Scientists tried to know how plants coordinate all these activities. They opined that growth and development, origin of different organs etc. of plants are controlled by some intrinsic secretion of plants. This organic compound is known as phytohormone or growth regulating substance. The first chemical component mentioned in the stem is auxin which is a phytohormone.

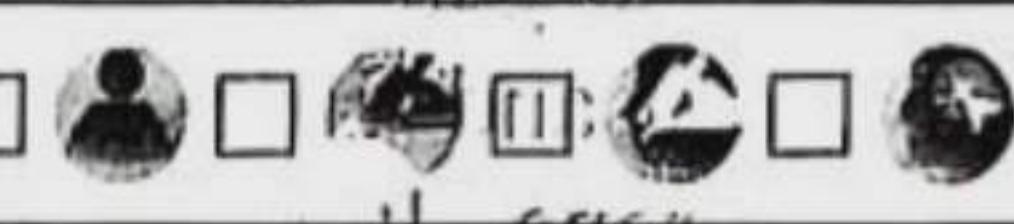
Charles Darwin first discovered this hormone. He observed the effect of light on the plumule membrane. When light falls obliquely on one side, the plumule grows towards the light source by bending gradually. In fact, the substance of the apical part of the plumule was a growth hormone auxin. Auxins can induce adventitious roots in stem cutting and plays an important role in inhibiting the process of abscission of fruits.

d Growth, reproduction, sensitivity are the characteristics of living organisms. Some intrinsic secretions in plants control these activities.

Different physiological activities of plants, including growth and movement, are performed systematically following some specific orders. One activity does not hamper another activity. Scientists tried to know how plants coordinate all these activities. They opined that growth and development, origin of different organs etc. of plants are controlled by some intrinsic secretion of plants. This organic compound is known as phytohormone or growth regulating substance. It controls all the physio-chemical activity of the plant. Plant hormones are the natural growth substances, which are usually synthesized in one part of a plant and are translocated to other parts where they exert their influences. Hormones found in plants are- auxins, gibberellins and cytokinins which enhance growth. Due to the effect of gibberellin hormone the internode of the plants elongates. Like other living organisms, plants also have sensitivity. Due to this, effect of internal or external stimuli on plant body creates sensation and consequently plant moves and grows. Besides, different stimuli like light, water, gravity etc. influence the growth of plants.

**Knowledge & Comprehension-based Q/A**

Designed as per topic

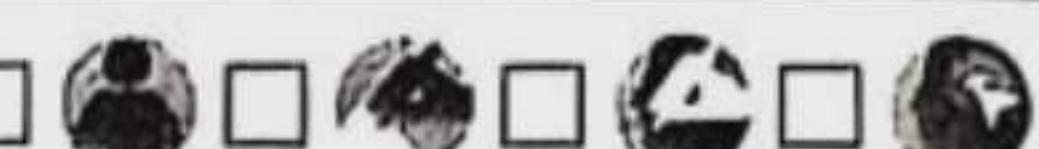
**Preparatory Knowledge-based Q/A****Question 1.** What does control different physiological activities of plants?**Ans.** An organic compound known as phytohormone controls different physiological activities of plants.**Question 2.** What are the growth regulating substances responsible for enhancing growth of plants?**Ans.** Organic compounds namely auxins, gibberellins and cytokines are found to be responsible for enhancing growth of plants.**Question 3.** What are the things which act as growth retarding agents?**Ans.** Abscisic acid and ethylene act as growth retarding agents.**Question 4.** Who did first discover hormone of plants?**Ans.** Charles Darwin first discovered hormone of plants.**Question 5.** What is the name of gaseous phytohormone found to be present in fruits, flowers, seeds, leaves and roots of plants?**Ans.** Ethylene gas, a kind of phytohormone is found to be present in fruits, flowers, seeds, leaves and roots of plants.**Question 6.** Which is the main part of nervous system?**Ans.** Brain is the main part of nervous system.**Question 7.** Which is the longest cell of the human body?**Ans.** A neurone or nerve cell is the longest cell of the human body.**Question 8.** How many parts are there in nervous system?**Ans.** There are three parts in nervous system.**Question 9.** What are the main organs of excretion?**Ans.** Lung, skin and kidney are the main organs of excretion.**Question 10.** What percent of the total nitrogenous excretory products of the body are eliminated as urine?**Ans.** 80% of the total nitrogenous excretory products of the body are eliminated as urine.**Question 11.** What percent of carbon dioxide do we breathe out?**Ans.** We breathe out 4% carbon dioxide.**Question 12.** What is the function of kidney?**Ans.** The function of kidney is the similar to that of filter.**Preparatory Comprehension-based Q/A****Question 1.** Why is co-ordination is an essential activity of the organism?**Ans.** Different physiological activities of an organism including growth and movement occur under some rules and regulations so that one activity does not hamper another one. In absence of co-ordination, life of plants as well as living beings become disorganized causing abolishing the existence of life cycle. So, co-ordination in plants is a must and essential.**Question 2.** What does regulate all the physico-chemical activities of plants?**Ans.** According to scientists, growth and development, origin of different organs, etc. of plants are being regulated by some organic compound known as phytohormone. This phytohormones are the natural growth substances which are usually synthesized in one part of a plant and are translocated and put influences to other parts.**Question 3.** Why is man known as the best of all the creatures of the universe?**Ans.** Brain of an animal is the main part of the nervous system. Amongst all animals, the brain of man is the most developed one. So, man is known as the best of all the creatures of the universe.**Question 4.** Why is brain called the sole controlling agent of the whole nervous system?**Ans.** The functions of the three major parts of human brain are as under :

- ⇒ Cerebrum (fore brain) : It regulates vision, hearing, smell, thinking, memory, knowledge, conscience, intelligence, movement of muscles, anger, shame, hot-cold, sleep and temperature.

- ⇒ Mid brain : It controls auditory and visual reflexes.

- ⇒ Hind brain : It maintains balance of the body. So, it is said that brain is the sole controlling agent of the whole nervous system.

Question 5. What does kidney play the role of?**Ans.** Kidney is termed as the factory of urine production. Because of the fact that it extracts and filters harmful nitrogenous waste products like ammonia, urea and uric acid from blood and excretes it from the body as a part of liquid called urine. So, it plays an important and vital physiological activity in the case of animal kingdom specially for mankind.

**Solutions to Textual Activities****Along with textual reference**

विज्ञान एवं प्रौद्योगिकी

**Solutions to Activities of Exercise**

Task 01 Why do you close your eyes when a bright light falls on them? Explain the reasons.

► Textbook Page 57

Solution : I close my eyes when a bright light falls on them because of a reflex action. A reflex action is an action that is not controlled by the brain but is caused by a stimulus. Reflex actions occur due to the immediate action of nerve impulses. Most of the nervous system's actions are controlled by the brain, and we can think about whether or not to perform those actions. However, actions controlled by the spinal cord are performed before we can even understand them. Closing our eyes immediately when light falls on them is also controlled by the spinal cord, so it is a reflex action.

Task 02 Cut off the top of a pothos plant. Now observe it for a few days. Explain what happens and why it happened so.

► Textbook Page 57

Solution : I cut off the top of a pothos plant. After cutting it, I observed for a few days that the dormant lateral buds on the stem were developing into branches. This is because a type of plant hormone called auxin is produced in the apical bud. This hormone helps the stem cells elongate and stops the growth of lateral buds. This characteristic of the apical bud is called apical dominance. When the top or apical bud of the pothos plant is cut off, the production of auxin at the top of the stem stops, and the elongation of stem cells also stops. As a result, the lateral buds start to grow.

**Super Suggestions**

Super Suggestions with 100% preparatory questions selected by the Master Trainer Panel

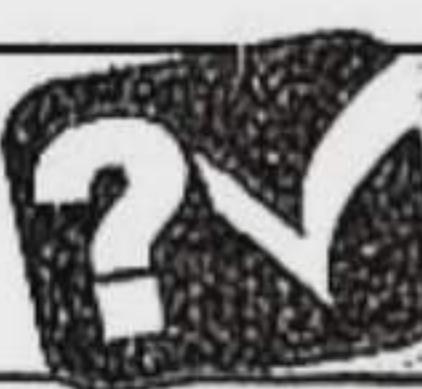
Dear learners, important multiple choice, short, creative, knowledge & comprehension-based questions of this chapter selected by Master Trainer Panel for Half-Yearly and Annual Exams are presented below. Learn the answers to the mentioned questions well to ensure 100% preparation.

Question Pattern	7★	5★
MCQs with Answers	Learn each MCQs in this chapter thoroughly.	
Short Q/A	1, 4, 8, 10, 13, 15, 18, 20, 25	2, 6, 9, 11, 17, 20, 26, 28, 32
Creative Q/A	2, 4, 6, 7, 10, 11	1, 3, 5, 8, 9
Knowledge-based Q/A	1, 3, 5, 8, 12	2, 4, 7, 9
Comprehension-based Q/A	2, 5	3

Exclusive Tips ► Master the solutions to all the activities in this chapter along with exercise and other Q/A to develop the creative thinking and assess your talent.



Assessment & Evaluation



A question bank presented in the form
of a class test to assess the preparation

Class Test

Time : 3 hours

Science

Class : Eight

Full marks : 100

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. Co-ordination includes—
 flowering germination
 growth all the above
2. Which prevents the process of abscission of fruits?
 Ethylene Cytokin in Auxin Gibberellin
3. Which hormone is present in fruits, flowers, seeds, leaves and roots?
 Auxin Gibberellin Ethylene Cytokinins
4. Which one is responsible for falling mango?
 Auxin Gibberellin Ethylene Cytokinin
5. Which of the following hormone is present in the fruit, flower and seed of a plant?
 Auxin Gibberellins Florigen Ethylene
- Read the stem and answer the questions No. 6 and 7 :
Mr. Karim has a fruit shop. He uses one kind of chemical to ripen green fruits.
6. What is the name of the chemical?
 Auxin Ethylene
 Gibberellins Abscisic acid
7. The characteristic of this chemical is—
 i. root grow up in cutting
 ii. found in leaves and roots.
 iii. seedling gives rise to the stem of the tree
Which one is correct?
 i & ii i & iii ii & iii i, ii & iii
8. The heart, the lung and the secretory glands are controlled by—
 the central nervous system (CNS)
 the peripheral nervous system (PNS)
 the autonomic nervous system (ANS)
 all the above
9. How many parts does the central nervous system have?
 Five Four Three Two
10. What is the largest part of the brain?
 Cerebrum Cerebellum Pons Medulla
11. Which part of the brain regulates adjustment with weather condition?
 lower cerebrum upper cerebrum
 midbrain the whole temporal lobe
12. Which one maintains the balance of the body?
 Carebrum Mid brain Hind brain Medulla
See the following figure and answer the questions No. 13 and 14 :

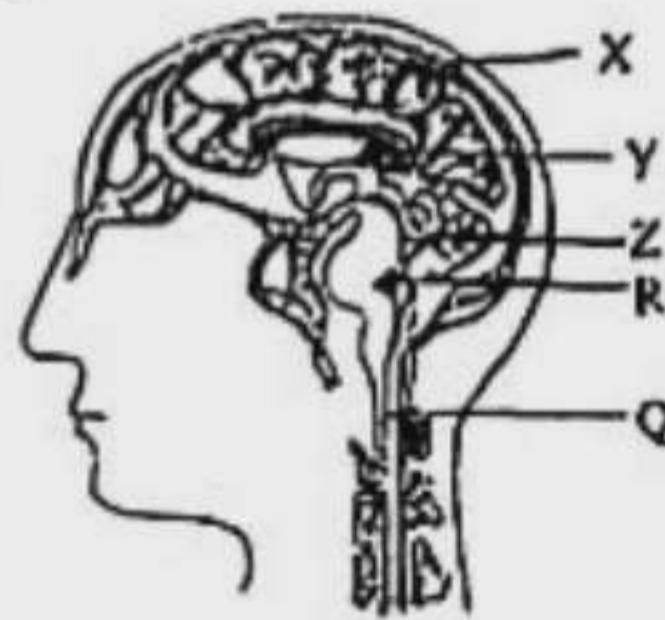


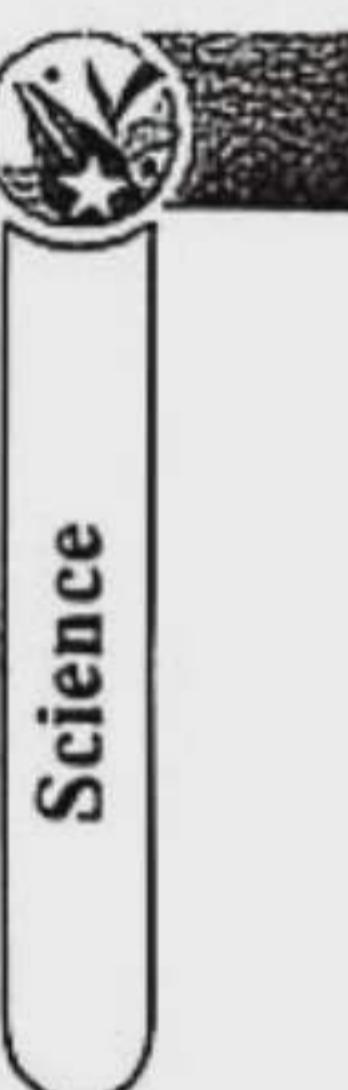
Fig : A

13. Which one is the pons in the figure?
 Y Z R Q
14. In the figure 'A' here 'X'—
 i. is the stalk of the brain
 ii. controls the temperature regulation
 iii. maintains the balance of body
Which one is correct?
 ii iii i & ii ii & iii

15. What percentage of carbon dioxide is in the air we breathe off?
 4% 5% 5.5% 6.25%
16. Which one of the following is termed as the factory of urine production?
 lung Skin Liver Kidney
17. Which one is the urine factory?
 Skin Kidney Liver Lungs
■ Read the following stem and answer the questions No. 18 and 19 :
Recently Prova has learnt to ride a bicycle. She became tired after long cycling. Returning home, she sat to read and fell asleep. Elder sister Preema made a fun and smoothy pricks a pin in her hand. Unknownly she withdrew her hand.
18. Which part of brain works for Prova's cycling?
 Cerebrum Mid brain
 Hind brain Cerebrum and mid brain
19. There relation with withdrawal of Prova's hand—
 i. interneurones
 ii. receptor
 iii. brains
Which one is correct?
 i & ii i & iii ii & iii i, ii & iii
20. Which part of human brain acts as center for auditory and visual reflexes?
 Fore brain Mid brain
 Hind brain Pons
21. Which one transmits the impulse from afferent neurones of efferent neurones?
 Synapses interneurones
 internal exchange Sensory nerve
22. Which one is the longest cell of the human body?
 Neurone Dendron Axon Cell body
23. Why neurone cell can not divide?
 No mitochondria No centriole
 No nucleus No centromere
24. By which impulse of nerve is transferred from one nerve cell to another nerve cell?
 Synapse Axon Dendron Dendrite
25. Deformed seedling are formed due to effect of which one?
 Cytokinin Gibberellin
 Ethylene Indole acetic acid
26. Which one of the following helps in ripening fruit?
 Auxin Gibberellin
 Ethylene Florigen
27. Which one is plant of smaller days?
 Chandramollika Sunflower
 Rose Jaba
28. In which place florigen is formed?
 Root Stem Leaves Flower
29. Which is used to prevent immature falling of mangoes from tree?
 Ethylene Auxin Gibberellins Cytokinins
30. Which part of the brain remains almost in a hanging position?
 Medulla Pons
 Diencephalon Cerebellum

Answer Sheet ▶ Multiple Choice Questions

1	<input type="radio"/>	2	<input type="radio"/>	3	<input type="radio"/>	4	<input type="radio"/>	5	<input type="radio"/>	6	<input type="radio"/>	7	<input type="radio"/>	8	<input type="radio"/>	9	<input type="radio"/>	10	<input type="radio"/>	11	<input type="radio"/>	12	<input type="radio"/>	13	<input type="radio"/>	14	<input type="radio"/>	15	<input type="radio"/>
16	<input type="radio"/>	17	<input type="radio"/>	18	<input type="radio"/>	19	<input type="radio"/>	20	<input type="radio"/>	21	<input type="radio"/>	22	<input type="radio"/>	23	<input type="radio"/>	24	<input type="radio"/>	25	<input type="radio"/>	26	<input type="radio"/>	27	<input type="radio"/>	28	<input type="radio"/>	29	<input type="radio"/>	30	<input type="radio"/>



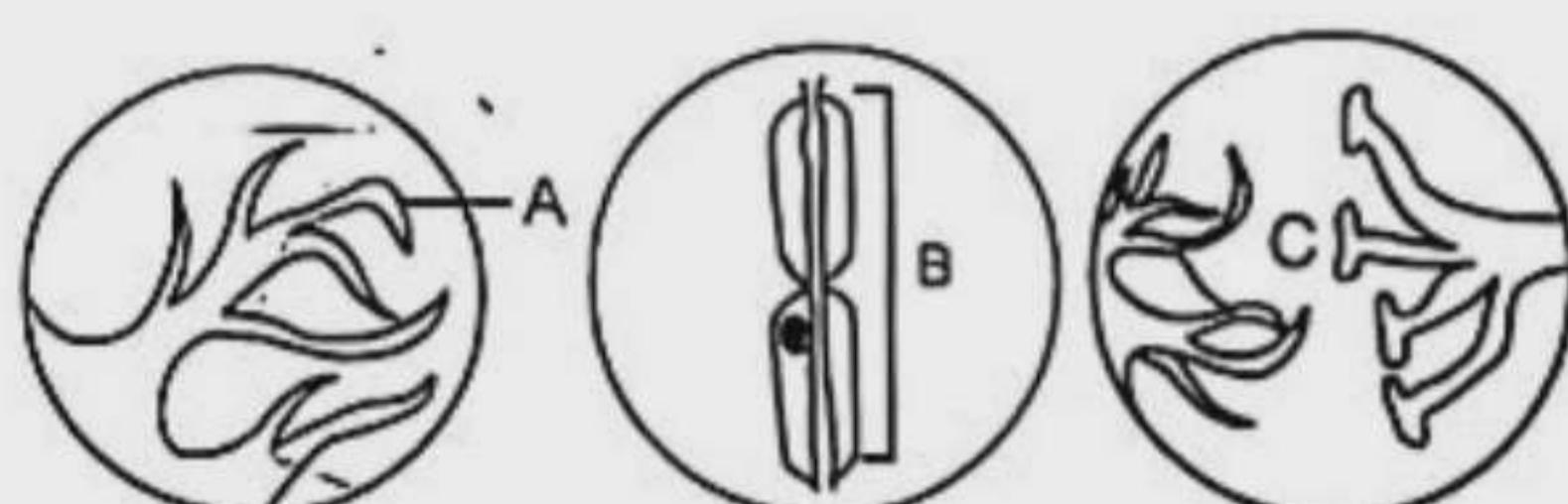
Short-Answer Question (Each question carries 2 marks)**Answer any 10 of the following questions :**

1. Write the names of two phytohormones.
2. What is meant by gaseous phytohormone?
3. Write two importances of gibberellin hormone in plants.
4. Write two differences between auxin and ethylene.
5. How many parts of a neurone are there and what are they?
6. What is an axon? Explain.
7. Mention two functions of neurones.
8. What is meant by the autonomic nervous system?

9. Why is the forebrain called the cerebrum?
10. How many parts of the hindbrain are there and what are they?
11. Why is the pons called the connector of the brain?
12. Why do we withdraw our hand immediately after being pricked by a pin?
13. What is excretion? Explain.
14. Why are kidneys called the main excretory organs?
15. Why is the kidney compared to a sieve?

Creative Question (Each question carries 10 marks)**Answer any 5 of the following questions :**

1.



- a. What is the cell body of a nerve composed of? 1
 - b. How do we sweat? 2
 - c. State the differences between A and B. 3
 - d. Evaluate the role of C in life. 4
2. Arman was reading a book attentively. In that time, a mosquito sits on his left hand. He drive it away by moving that hand immediately without moving his eyes from book.
 - a. What is nervous system? 1
 - b. Why neurone is not divided? Explain it. 2
 - c. Draw the figure of the combined act of the nervous process that is mentioned in the stem. 3
 - d. "To response for the mosquito bite is not controlled by Arman's brain?"—Give your logical comment. 4
 3. During stitching katha, a needle pricks the skin of Mina's hand. She makes a sound 'uff'. Her elder brother said, "Be careful".
 - a. What is phytohormone? 1
 - b. Why the stem of plants bend towards the source of light? 2
 - c. Explain the incident of making sound by Mina. 3
 - d. How the speech of Mina's brother generate by a special system? Analyze. 4

4.



- a. What is called excretory system? 1
- b. Why does the fruit fall earlier? 2
- c. What role does the fig play in transmitting impulses in human body? Explain. 3
- d. The structure of the cell of the stem is different from the structure of the other cells.—Analyze with logic. 4

5. Munni live in village. She put a pencil inclined way in a glass filled with water and observe that the pencil looks small and thick. Suddenly her hand fall upon on the hot chimney of hurricane, instantly she move away her hand from the chimney.

- a. What is called critical angle? 1
- b. What is the reason for not light reflection inside the eye? 2
- c. Explain the reason of the incident that Munni observed. 3
- d. Is it involved Munni's last activities with her nervous system? Give logic. 4

6. The children fear from fire. And it feel pain to push pin. Its give up unwanted waste by stool and urine. These are occur reflexive system.

- a. What is cerebellum? 1
- b. Explain what type of hormone is ethylene. 2
- c. How does the system mentioned in the stem act? 3
- d. Explain the action mentioned in the stem. 4

7.

Kidney	Neuron
--------	--------

Q R

- a. What is nerve impulse? 1
- b. What do you mean by tropic movement? 2
- c. "The organ 'Q' of the stem is the factory of preparing urine."—Explain it. 3
- d. If the organ 'R' of the stem does not work properly, in that time what type of problems are occurred in the human body? Give your logic. 4

8. There are some chemical components like auxin, gibberellin and ethylene etc are considered as the intrinsic secretion of plants. These intrinsic secretions play some important role in growth and development of plants.

- a. What is excretion? 1
- b. What do you mean by synapse? 2
- c. Explain the influences of the first chemical component mentioned in the above stem in plant body. 3
- d. Analyze the last sentence of the above mentioned stem. 4

Answering Reference ► Short-Answer Questions

- 1 ► See this Chapter, Ques. 02 | 5 ► See this Chapter, Ques. 11 | 9 ► See this Chapter, Ques. 20 | 13 ► See this Chapter, Ques. 29
 2 ► See this Chapter, Ques. 04 | 6 ► See this Chapter, Ques. 13 | 10 ► See this Chapter, Ques. 22 | 14 ► See this Chapter, Ques. 32
 3 ► See this Chapter, Ques. 06 | 7 ► See this Chapter, Ques. 15 | 11 ► See this Chapter, Ques. 24 | 15 ► See this Chapter, Ques. 34
 4 ► See this Chapter, Ques. 08 | 8 ► See this Chapter, Ques. 17 | 12 ► See this Chapter, Ques. 27

- 9 ► See this Chapter, Ques. 20 | 13 ► See this Chapter, Ques. 29 | 11 ► See this Chapter, Ques. 09 | 7 ► See this Chapter, Ques. 11
 10 ► See this Chapter, Ques. 22 | 14 ► See this Chapter, Ques. 32 | 12 ► See this Chapter, Ques. 10 | 8 ► See this Chapter, Ques. 12

Answering Reference ► Creative Questions

- 1 ► See this Chapter, Ques. 02 | 3 ► See this Chapter, Ques. 05 | 5 ► See this Chapter, Ques. 09 | 7 ► See this Chapter, Ques. 11
 2 ► See this Chapter, Ques. 03 | 4 ► See this Chapter, Ques. 06 | 6 ► See this Chapter, Ques. 10 | 8 ► See this Chapter, Ques. 12