VIDYAJYOTHI

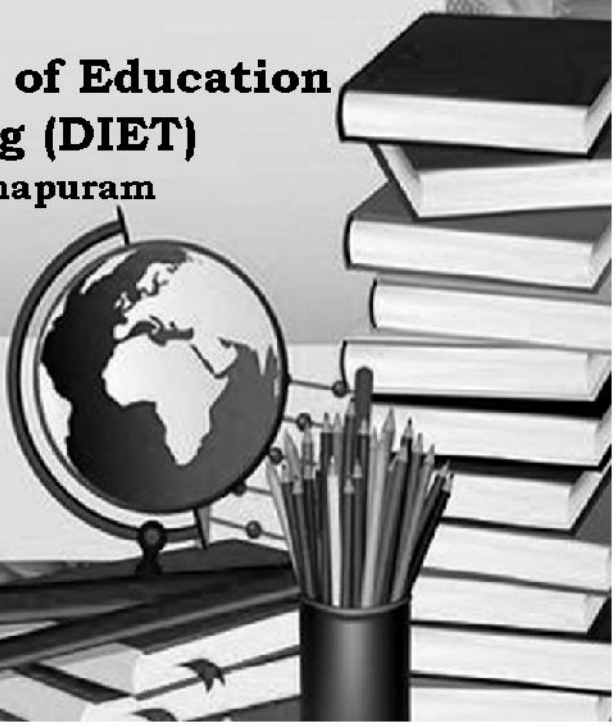
(2020 - 2021)

BIOLOGY

WORKSHEET

CLASS X

District Institute of Education and Training (DIET)
Thiruvananthapuram



Vidyajyothi

Biology

(Worksheet)

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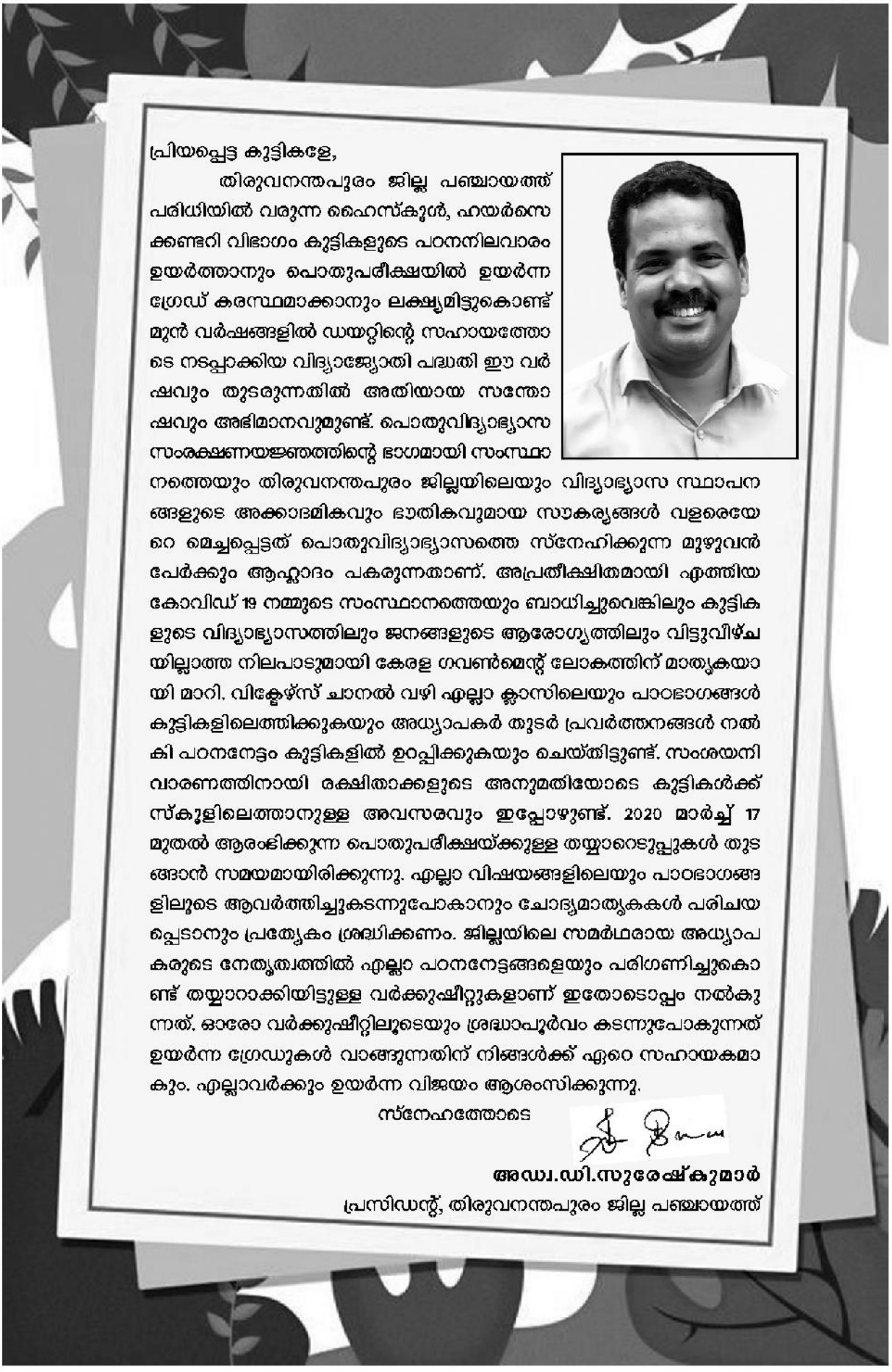


പ്രിയപ്പെട്ട കുട്ടികളേ,

തിരുവനന്തപുരം ജില്ല പഞ്ചായത്ത് പരിധിയിൽ വരുന്ന ഹൈസ്കൂൾ, ഹയർസെക്കണ്ടറി വിഭാഗം കുട്ടികളുടെ പഠനനിലവാരം ഉയർത്താനും പൊതുപരീക്ഷയിൽ ഉയർന്ന ഗ്രേഡ് കരസ്ഥമാക്കാനും ലക്ഷ്യമിട്ടുകൊണ്ട് മുൻ വർഷങ്ങളിൽ ഡയറ്റിന്റെ സഹായത്തോടെ നടപ്പാക്കിയ വിദ്യാജ്യോതി പദ്ധതി ഈ വർഷവും തുടരുന്നതിൽ അതിയായ സന്തോഷവും അഭിമാനവുമുണ്ട്. പൊതുവിദ്യാഭ്യാസ സംരക്ഷണയജ്ഞത്തിന്റെ ഭാഗമായി സംസ്ഥാനത്തെയും തിരുവനന്തപുരം ജില്ലയിലെയും വിദ്യാഭ്യാസ സ്ഥാപനങ്ങളുടെ അക്കാദമികവും ഭൗതികവുമായ സൗകര്യങ്ങൾ വളരെയേറെ മെച്ചപ്പെട്ടത് പൊതുവിദ്യാഭ്യാസത്തെ സ്നേഹിക്കുന്ന മുഴുവൻ പേർക്കും ആഹ്ലാദം പകരുന്നതാണ്. അപ്രതീക്ഷിതമായി എത്തിയ കോവിഡ് 19 നമ്മുടെ സംസ്ഥാനത്തെയും ബാധിച്ചുവെങ്കിലും കുട്ടികളുടെ വിദ്യാഭ്യാസത്തിലും ജനങ്ങളുടെ ആരോഗ്യത്തിലും വിട്ടുവീഴ്ചയില്ലാത്ത നിലപാടുമായി കേരള ഗവൺമെന്റ് ലോകത്തിന് മാതൃകയായി മാറി. വിക്ടേഴ്സ് ചാനൽ വഴി എല്ലാ ക്ലാസിലെയും പാഠഭാഗങ്ങൾ കുട്ടികളിലെത്തിക്കുകയും അധ്യാപകർ തുടർ പ്രവർത്തനങ്ങൾ നൽകി പഠനനേട്ടം കുട്ടികളിൽ ഉറപ്പിക്കുകയും ചെയ്തിട്ടുണ്ട്. സംശയനിവാരണത്തിനായി രക്ഷിതാക്കളുടെ അനുമതിയോടെ കുട്ടികൾക്ക് സ്കൂളിലെത്താനുള്ള അവസരവും ഇപ്പോഴുണ്ട്. 2020 മാർച്ച് 17 മുതൽ ആരംഭിക്കുന്ന പൊതുപരീക്ഷയ്ക്കുള്ള തയ്യാറെടുപ്പുകൾ തുടങ്ങാൻ സമയമായിരിക്കുന്നു. എല്ലാ വിഷയങ്ങളിലെയും പാഠഭാഗങ്ങളിലൂടെ ആവർത്തിച്ചുകടന്നുപോകാനും ചോദ്യമാതൃകകൾ പരിചയപ്പെടാനും പ്രത്യേകം ശ്രദ്ധിക്കണം. ജില്ലയിലെ സമർഥരായ അധ്യാപകരുടെ നേതൃത്വത്തിൽ എല്ലാ പഠനനേട്ടങ്ങളെയും പരിഗണിച്ചുകൊണ്ട് തയ്യാറാക്കിയിട്ടുള്ള വർക്കുഷീറ്റുകളാണ് ഇതോടൊപ്പം നൽകുന്നത്. ഓരോ വർക്കുഷീറ്റിലൂടെയും ശ്രദ്ധാപൂർവം കടന്നുപോകുന്നത് ഉയർന്ന ഗ്രേഡുകൾ വാങ്ങുന്നതിന് നിങ്ങൾക്ക് ഏറെ സഹായകമാകും. എല്ലാവർക്കും ഉയർന്ന വിജയം ആശംസിക്കുന്നു.

സ്നേഹത്തോടെ

അഡ്വ.ഡി.സുരേഷ്കുമാർ

പ്രസിഡന്റ്, തിരുവനന്തപുരം ജില്ല പഞ്ചായത്ത്

Members participated in the workshop

1. **Sri. Nisar Ahamed.M**
   Govt.HSS Venjaramood
2. **Sri. Lalkumar.S**
   Govt.HSS Venjaramood
3. **Smt. Raji.V.K**
   Govt.Girls HSS Nedumangad
4. **Smt. Kala Rani.P.G**
   Govt.V&HSS Kottukal
5. **Smt. Sreeja Kumary.T**
   Govt.V&HSS Kulathoor, Neyyattinkara
6. **Smt. Seetha Lekshmi.A.S**
   Govt.HSS Marayamuttom
7. **Smt. Annie Jude**
   St.Roch's HS Thope, Vallakadavu
8. **Sri. Muhammed Ansari.M.S**
   PNMGHSS Koonthaloor
9. **Smt. Rekha.P.G**
   Govt.HSS Thonnakkal
10. **Sri. Gopakumaran Nair.M.S**
    NSS HS Chowalloor
11. **Smt. Rekha.B**
    Govt. Girls HSS Cottonhill
12. **Smt. Neena.M.A**
    Dr.AMMRHSS for Girls, Kattela

Message

പ്രിയപ്പെട്ട കുട്ടികളേ

വളരെ വ്യത്യസ്തമായ ഒരു അധ്യയനവർഷത്തിലൂടെയാണ് നാം കടന്നുപോകുന്നത്. കോവിഡ് 19 സൃഷ്ടിച്ച ആശങ്കകൾക്കിടയിലും പഠനം മുടങ്ങാതിരിക്കാനുള്ള എല്ലാ മുൻകരുതലും കേരള സർക്കാരും വിദ്യാഭ്യാസവകുപ്പും സ്വീകരിച്ചിട്ടുണ്ട്. വിക്ടേഴ്സ് ചാനൽ വഴി പ്രക്ഷേപണം ചെയ്യുന്ന ക്ലാസുകൾക്ക് വലിയ സ്വീകാര്യതയാണ് ലഭിക്കുന്നത്. വിവരവിനിമയ സാങ്കേതികവിദ്യയുടെ ഉപയോഗം വിദ്യാഭ്യാസപ്രക്രിയയ്ക്ക് കൂടുതൽ കരുത്ത് പകർന്നിട്ടുണ്ട്. പത്താംക്ലാസ്, ഹയർസെക്കണ്ടറി വിഭാഗം കുട്ടികളുടെ വിജയശതമാനം ഉയർത്താൻ ലക്ഷ്യം വച്ചുകൊണ്ട് തിരുവനന്തപുരം ജില്ലപഞ്ചായത്തും ഡയറ്റും മുൻവർഷങ്ങളിൽ നടപ്പാക്കിയ വിദ്യാജ്യോതി പദ്ധതി ഈ വർഷവും തുടരുകയാണ്. പാഠഭാഗങ്ങളുടെ ഉള്ളടക്കത്തെ ലളിതമായ ആശയങ്ങളാക്കി മാറ്റി എല്ലാ കുട്ടികൾക്കും എളുപ്പത്തിൽ ഗ്രഹിക്കാൻ കഴിയുന്ന വിധം വർക്കുഷീറ്റുകൾ തയാറാക്കി നൽകാനാണ് ഇപ്പോൾ തീരുമാനിച്ചിട്ടുള്ളത്. ഇതിനായി എല്ലാ വിഷയങ്ങളുടെയും വർക്കുഷീറ്റുകൾ തയാറായിട്ടുണ്ട്. പാഠപുസ്തകത്തെ രണ്ട് ഭാഗങ്ങളാക്കിയാണ് വർക്കുഷീറ്റ് നിർമാണം പുരോഗമിക്കുന്നത്. ആദ്യഘട്ടം വർക്കുഷീറ്റുകൾ ഇതോടൊപ്പം ചേർക്കുന്നു. എല്ലാ വർക്കുഷീറ്റിലൂടെയും ശ്രദ്ധാപൂർവം കടന്നുപോകണം. എല്ലാവർക്കും മികച്ച വിജയം ആശംസിക്കുന്നു.

സ്നേഹത്തോടെ
സന്തോഷ്കുമാർ എസ്.
വിദ്യാഭ്യാസ ഉപഡയറക്ടർ, തിരുവനന്തപുരം

Message

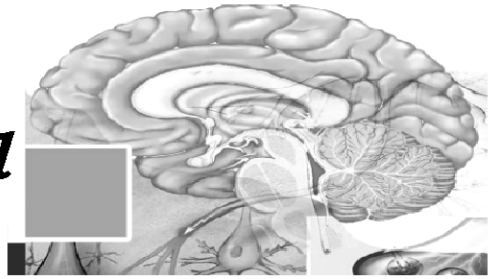
പ്രിയപ്പെട്ട കുട്ടികളേ,

അപ്രതീക്ഷിതമായി എത്തിയ കോവിഡ് 19 വിദ്യാഭ്യാസമേഖലയിൽ വലിയ വെല്ലുവിളിയാണ് ഉയർത്തിയത്. രോഗവ്യാപനസാഹചര്യത്തിലും വിദ്യാഭ്യാസം സുഗമമാക്കുന്നതിന് വിദ്യാഭ്യാസവകുപ്പും സമൂഹവും ഒന്നുചേർന്ന് പ്രവർത്തിക്കുകയുണ്ടായി. കോവിഡിനെ അതിജീവിക്കാനായി സ്വീകരിച്ച ഓരോ വഴിയും പിന്നീട് സൗകര്യമായും ശീലമായും മാറുമോയെന്ന് ആശങ്കപ്പെടേണ്ടതുണ്ട്. ഓരോന്നിനെയും അതിന്റെ മേന്മ നോക്കി സ്വീകരിച്ചാൽ ഈ പ്രശ്നം പരിഹരിക്കാൻ കഴിയും. ഒരു കാര്യം ഉറപ്പാണ്. മനുഷ്യരാശി കോവിഡിന്റെ പിടിയിൽനിന്ന് മുക്തരാകും. പക്ഷേ കോവിഡിനു മുമ്പുള്ള സാമൂഹ്യസാഹചര്യത്തിലേയ്ക്ക് തിരികെപ്പോകാൻ കഴിയാതെ വന്നേക്കും. എങ്കിലും നമുക്ക് ശുഭപ്രതീക്ഷയാണുള്ളത്. തിരുവനന്തപുരം ജില്ല പഞ്ചായത്തും ഡയറ്റും ചേർന്ന് നടപ്പാക്കുന്ന വിദ്യാജ്യോതി പദ്ധതി ഏറ്റവുമധികം ശ്രദ്ധയാകർഷിച്ച പരിപാടിയാണ്. മുൻവർഷങ്ങളിൽ ആറ് വിഷയങ്ങൾക്കുമാത്രമാണ് പഠനസഹായി തയാറാക്കിയത്. ഈ വർഷം എല്ലാ വിഷയത്തിന്റെയും ഉള്ളടക്കമേഖലകളെ ലളിതമായി വ്യാഖ്യാനിച്ച് കുട്ടികളുടെ മുമ്പിൽ വർക്കുഷീറ്റുകളായി എത്തിക്കാനാണ് ലക്ഷ്യമിട്ടിട്ടുള്ളത്. ഉയർന്ന വിജയം കരസ്ഥമാക്കാൻ ഈ വർക്കുഷീറ്റുകൾ സഹായകമാകും. പരിചയസമ്പന്നരായ അധ്യാപകരാണ് ഓരോ വിഷയത്തിന്റെയും വർക്കുഷീറ്റുകൾ തയാറാക്കുന്നതിന് നേതൃത്വം നല്കിയത്. എല്ലാ വർക്കുഷീറ്റുകളിലൂടെയും കടന്നുപോയി ഉയർന്ന വിജയത്തിലെത്താൻ മുഴുവൻ കുട്ടികൾക്കും കഴിയട്ടെയെന്ന് ആശംസിക്കുന്നു.

വിശ്വസ്തതയോടെ
ഡോ.ഷീജാകുമാരി
പ്രിൻസിപ്പൽ ഇൻ ചാർജ്, ഡയറ്റ് തിരുവനന്തപുരം.

CONTENTS

1 Sensations and Responses



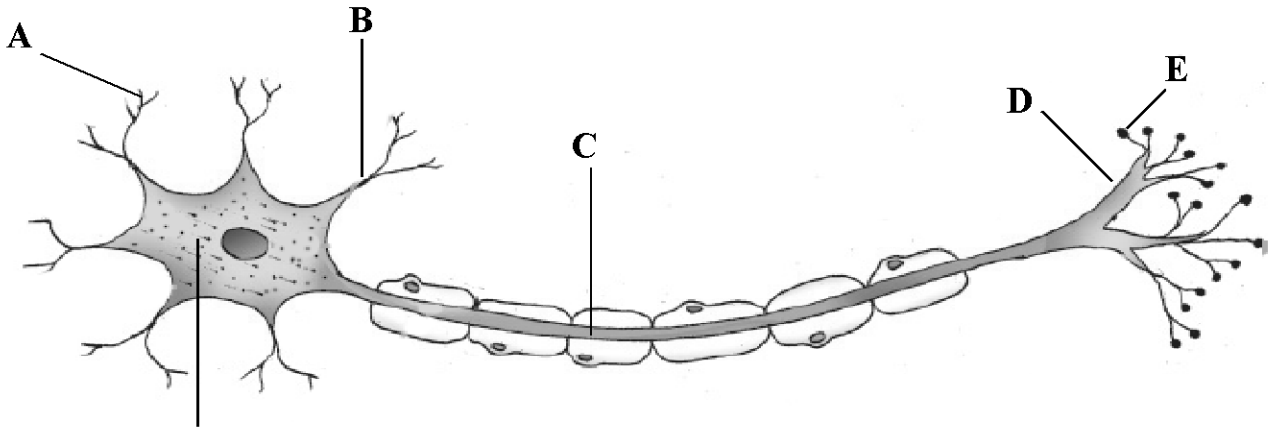
Main concepts

- Stimuli - The senses that evoke responses in organisms.
- Receptors are specialized cells in the sense organs and other parts of the body to receive stimuli.
- The nervous system includes the brain, spinal cord, nerves and receptors.
- Neuron - The structural and functional unit of the nervous system.
- Myelin sheath - Axons of most of the neurons are covered by the myelin sheath, a membrane containing a lipid called myelin.
- Myelin sheath in the nerves is formed of Schwann cells.
- Myelin sheath in the brain and the spinal cord is formed of specialized cells called oligodendrocytes.
- Synapse - The junction between two neurons or a neuron and a muscle cell or a neuron and a glandular cell.
- Sensory nerve - Carries impulses from various parts of the body to the brain and the spinal cord.
- Motor nerve - Carries impulses from brain and spinal cord to various parts of the body.
- Mixed nerve - Carries impulses to and from the brain and spinal cord.
- Central nervous system - Consists of brain and the spinal cord.
- Peripheral nervous system - Consists of 12 pairs of cranial nerves and 31 pairs of spinal nerves.
- The major parts of brain - Cerebrum, Cerebellum, Medulla oblongata, Thalamus, Hypothalamus
- Reflex action - The accidental and involuntary responses towards stimuli.
- Reflex arc - Pathway of impulses in the reflex action.
- Activities that take place beyond the conscious level are controlled by the autonomous nervous system, a part of the peripheral nervous system.

- The sympathetic system and the parasympathetic system together form the autonomous nervous system.
- Diseases affecting the nervous system - Alzheimer's, Parkinsons, Epilepsy

WORKSHEETS

1. Observe the figure and answer the following questions.



(a) Identify the figure.

(b) Complete the table using the suitable terms given in the box.

Dendron, Secretes neurotransmitter, Axon, Part that receives impulses from adjacent neuron, Carries impulses from the cell body to outside, Axonite, Carries impulses from dendrites to the cell body, Dendrite, Carries impulses to the synaptic knob, Synaptic knob

Part	Name of part	Function
A	Dendrite	.....(i) .....
B	.....(ii)	Carries impulses from dendrites to the cell body
C	.....(iii)	.....(iv) .....
D	.....(v)	.....(vi) .....
E	.....(vii)	.....(viii) .....

2. Select the correct pairs.

(A) Dendrite - Branches of Dendron

(B) Dendron - Longest filament from the cell body.

(C) Axonite - Branches of axon.

(D) Synaptic knob - Short filament from the cell body.

(E) Axon - Longest filament from the cell body

(F) Dendron - Short filament from the cell body.

(G) Axon - Branches of Dendron

(H) Dendrite - Branches of Axon

(I) Axonite - Short filament from the cell body.

(J) Synaptic knob - Tip of axonite.

3. Make corrections in the underlined portions if any, in the statements given below.

(a) The specialized cells in the sense organs and other parts of the body to receive stimuli are known as receptors.

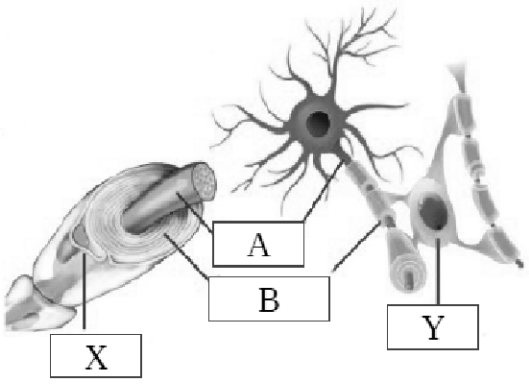
(b) The senses that evoke responses in organisms are called impulses.

(c) Myelin sheath in the brain and the spinal cord is formed of specialized cells called Schwann cells.

(d) The part of the brain and the spinal cord where myelinated nerve cells are present in abundance is called white matter.

(e) One of the major functions of the myelin sheath is to accelerate impulses.

4. Observe the illustration and answer the following questions.



(a) Identify the parts indicated as A,B.

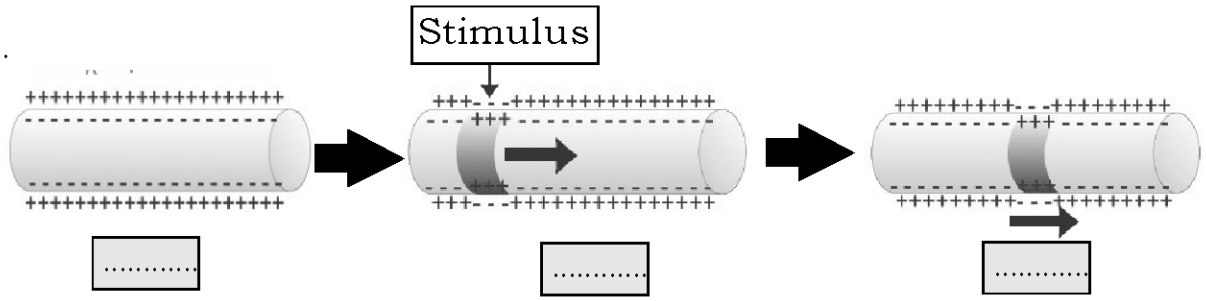
(b) Write the difference between the parts indicated as X and Y.

5. The statements related to the generation and transmission of impulses are given below. Select the letters related to each statement and label in the figures given below.

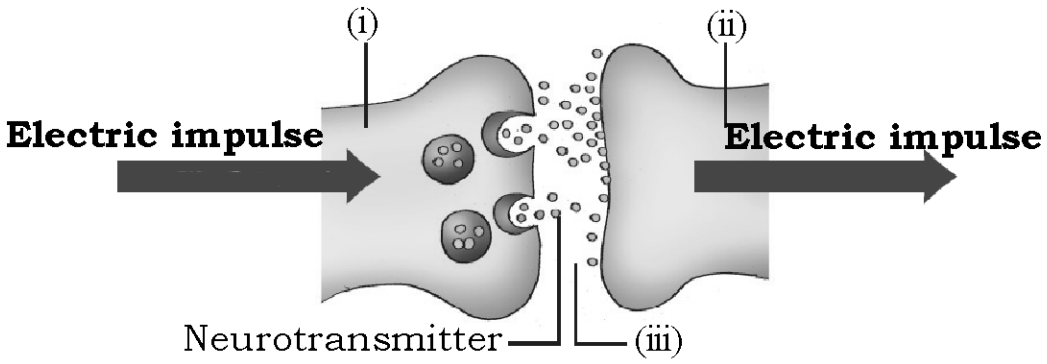
A. This momentary charge difference stimulates its adjacent parts and similar changes occur there too.

B. The outer surface of the plasma membrane of the neuron is positively charged and the inner surface is negatively charged.

C. When stimulated, the distribution of ions in that particular part changes and hence the inner surface becomes positively charged and the outer surface becomes negatively charged.



6.Observe the illustration and answer the following questions.



(a) Identify the parts indicated as (i) and (ii).

(b) Identify the part indicated as (iii). What is its function?

(c) Write two examples for neurotransmitter.

(d) What is the role of neurotransmitter in the transmission of impulses?

(e) Complete the flow chart of impulses passing through a neuron.

Stimulus → Dendrite → .....(i)..... → Cell body → ....(ii)..... → Axonite →.... (iii)..... → .... (iv)..... → Dendrite of adjacent neuron.

7. Select the statemets related to motor nerve from the statements given below.

(a) Carries impulses to and from the brain and spinal cord.

(b) Carries impulses from various parts of the body to the brain and the spinal cord.

(c) Carries impulses from brain and spinal cord to various parts of the body.

8. Select the correct pairs.

(a) Brain - Central nervous system

(b) Cranial nerves - Central nervous system

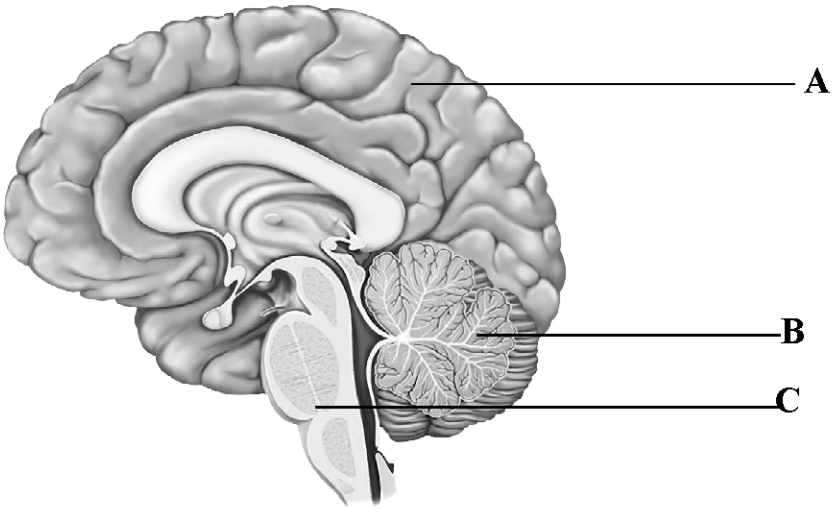
(c) Spinal cord - Peripheral nervous system

(d) Spinal nerves - 31 pairs

(e) Spinal nerves - Peripheral nervous system

(f) Cranial nerves - 21 pairs

9. Observe the figure and answer the following questions.



(a) Identify the parts indicated as A,B,C?

(b) The statements related to the parts of the brain are given below. Arrange them in the table giving suitable title.

(i) Seen behind the cerebrum as two flaps.

(ii) Controls voluntary movements.

(iii) Coordinates muscular activities and maintains equilibrium of the body.

(iv) The rod shaped part seen below the cerebrum, located near the cerebellum.

(v) Centre of thought, intelligence, memory and imagination.

(vi) Fissures and grooves are present.

(vii) Controls heart beat.

(viii) Evokes sensations.

(ix) Controls involuntary actions.

(x) The second largest part of the brain.

(c) Redraw the figure of brain, identify and label the parts based on the functions given below.

(a) Plays a major role in the maintenance of homeostasis

(b) Analyses impulses from various parts of the body and sends the important ones to the cerebrum.

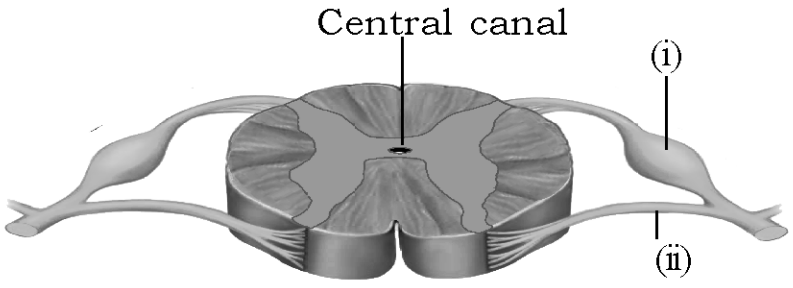
10. The fluid seen in the ventricles of the brain is formed from blood and is reabsorbed into the blood.

(a) Do you agree with this statement? Why?

(b) Which fluid is this?

(c) In which parts of the nervous system, this fluid is present?

11. Observe the figure and answer the following questions.



(a) Identify the figure.

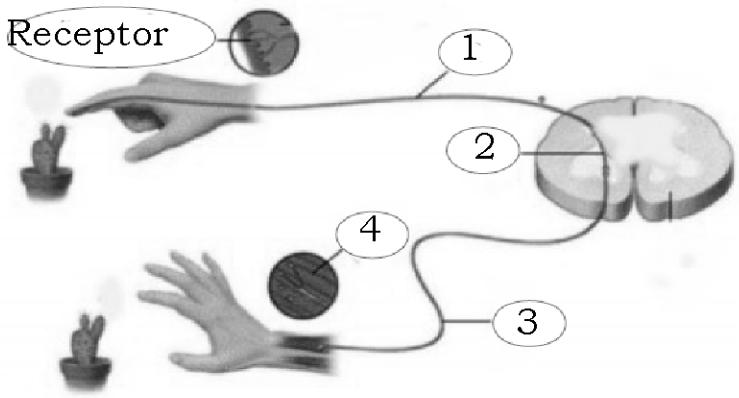
(b) How this part is protected?

(c) What are the functions of this part?

(d) Identify the parts indicated as (i), (ii). How they differ from each other in their function?

(e) Name the fluid seen inside the central canal. What are the functions of this fluid?

12. Observe the illustration and answer the following questions.



(a) Identify the parts indicated as 1,2,3,4.

(b) What is reflex arc?

(c) The parts in the pathway of impulse in a reflex action are g iven below. Arrange them in correct order.

(i) Interneuron - Generates quick responses according to the sensory impulses.

(ii) Related muscle - Withdraws the hand by the action of the muscles.

(iii) Receptor - Generates impulses.

(iv) Motor neuron - Carries the information from spinal cord to related muscles.

(v) Sensory neuron - Carries impulses to the spinal cord.

13. Label CR to the statements related to cerebral reflexes, and SR to the statements related to spinal reflexes.

(a) We blink our eyes when objects move towards them. ☐

(b) Spinal cord acts as the centre of reflex action. ☐

(c) Sudden withdrawal of leg while piercing a thorn. ☐

(d) Reflexes that are under the control of the cerebrum. ☐

(e) We blink our eyes when light suddenly falls on our eyes. ☐

14. Identify the odd one from the following groups and write the common feature of the others in each group.

(a) The pupil in the eye dilates, Peristalsis in the intestine slows down, Heart beat becomes normal, Production of hormone increases.

(b) Glycogen is converted to glucose, Gastric activities slow down, Heart beat increases, Urinary bladder contracts.

(c) Trachea expands, The pupil in the eye contracts, Production of saliva increases, Production of hormone decreases.

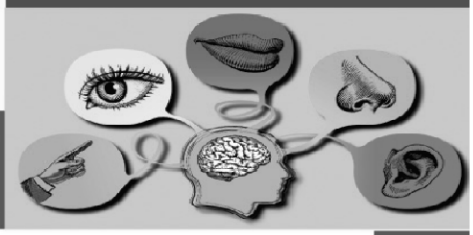
(d) Urinary bladder regains normal state, Glycogen is converted to glucose, The pupil in the eye contracts, Heart beat increases.

(e) Production of hormone increases, Urinary bladder contracts, Heart beat becomes normal, Peristalsis in the intestine becomes normal.

15. Arrange column B,C in accordance with the column A.

A	B	C
(i) Alzheimer's	(a) Continuous and irregular flow of electric charges in the brain.	(1) Loss of body balance, irregular movement of muscles, shivering of the body, profuse salivation.
(ii) Epilepsy	(b) Destruction of specialised ganglions in the brain. Production of dopamine, a neurotransmitter in the brain gets reduced.	(2) Loss of memory, inability to recognize friends and relatives, inability to do routine works.
(iii) Parkinsons	(c) Accumulation of an insoluble protein in the neural tissues of the brain. Neurons get destroyed.	(3) Fits due to continuous muscular contraction, frothy discharge from the mouth, clenching of the teeth following which the patient falls unconscious.

2 Windows Of Knowledge



Main concepts

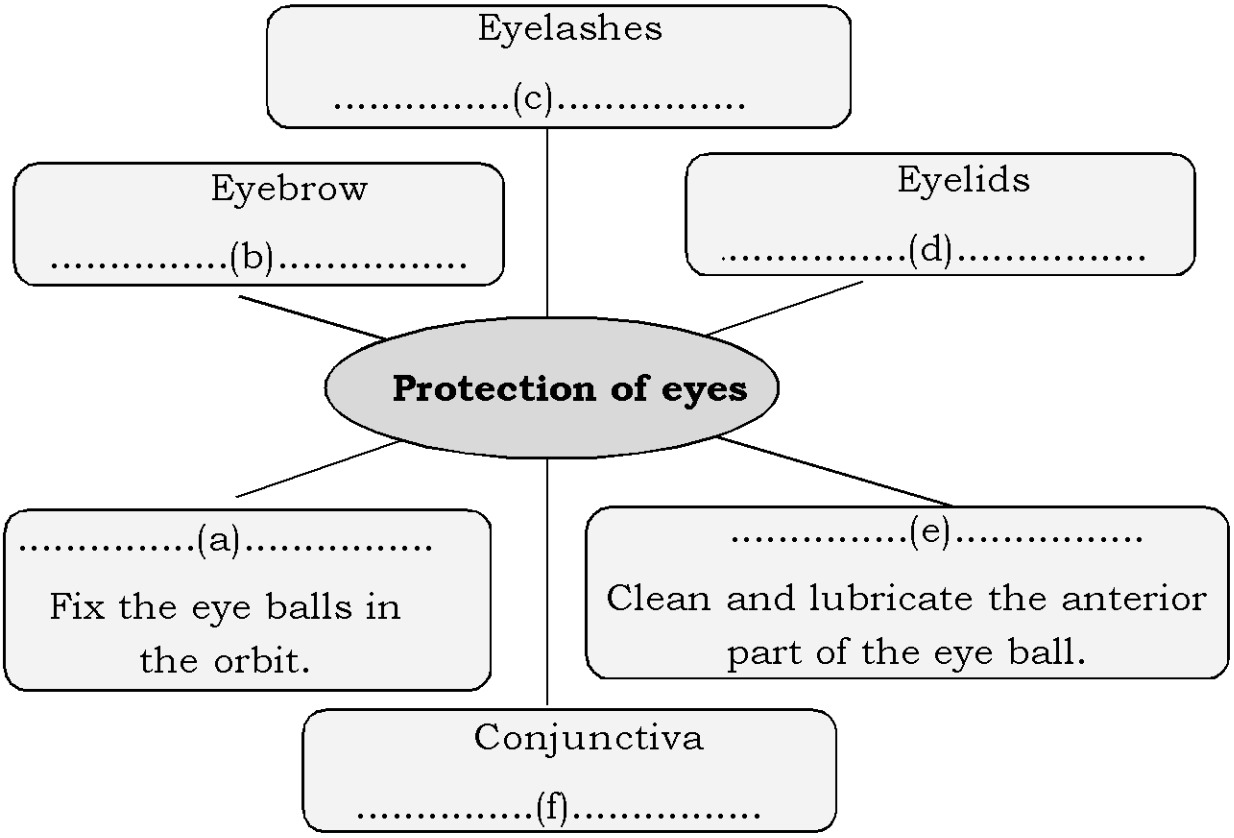
- Tears - Clean and lubricate the anterior part of the eye ball.
- Lysozyme, the enzyme present in tears, destroys germs that enter the eyes.
- Layers of the eye- Sclera, Choroid, Retina
- Parts of eye - Cornea, Conjunctiva, Iris, Pupil, Lens, Ciliary muscles, Yellow spot, Blind spot, Optic nerve.
- Fluids in the eye - Aqueous humor, Vitreous humor.
- The size of the pupil is regulated by the action of circular muscles and radial muscles seen in the iris.
- The ability of the eye to adjust the focal length of the lens by changing its curvature in accordance to the distance of the object from the eye and form the image on the retina is called the power of accommodation of the eye.
- Rod cells and cone cells are the photoreceptors present in the retina.
- Rod cells contain the visual pigment called rhodopsin and cone cells contain the visual pigment called photopsin (iodopsin).
- There are three types of cone cells in our eyes, which help us to detect three primary colours of light - red, green and blue.
- Eye defects and diseases - Night blindness, Xerophthalmia, Colour blindness, Glaucoma, Cataract, Conjunctivitis.
- The ear not only help us in hearing, but also in maintaining the balance of the body.
- The main parts of ear - External ear, Middle ear, Inner ear.
- Eustachian tube protects the tympanum by balancing the pressure on either side of the tympanum.
- The basilar membrane and sensory hair cells together

constitute the Organ of Corti.

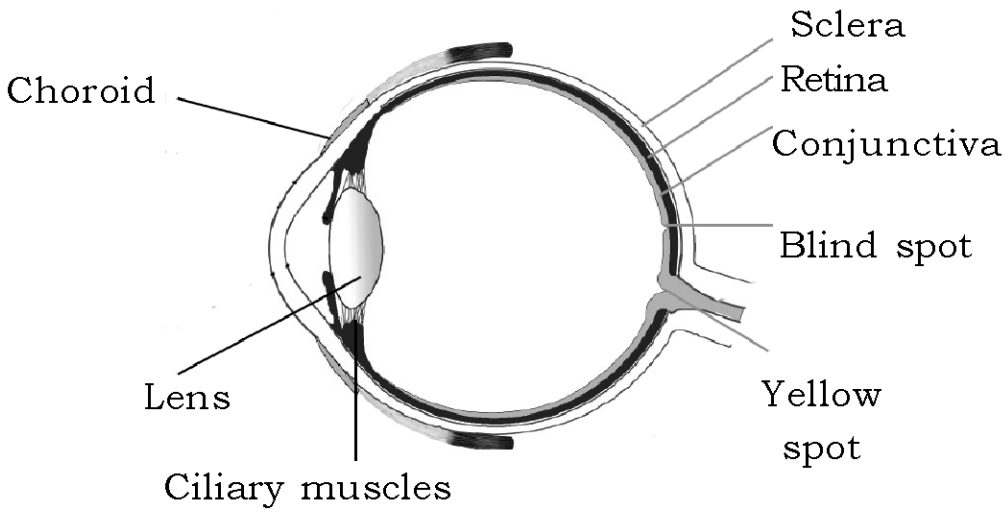
- Chemoreceptors seen inside the mouth and tongue help us to detect taste.
- The parts seen on the papillae that detect taste are the taste buds.
- We have taste buds that are stimulated by tastes like sweet, salt, sour, bitter, umami etc.
- Receptors in the skin - Pain receptor, Cold receptor, Touch receptor, Pressure receptor, Temperature receptor.

WORKSHEETS

1. Complete the wordsun.



2. Observe the figure and answer the following questions.

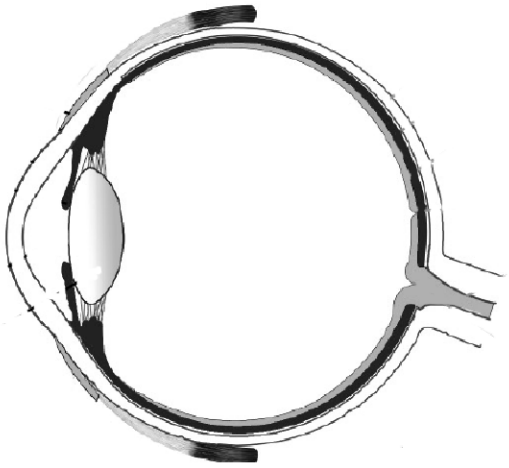


(a) Correctly label, if any parts are incorrectly labelled.

(b) Complete the table related to the parts of eye and its peculiarity.

Peculiarity	Part of eye
The outer layer, made up of connective tissues.	.....(i) .....
The layer which covers and protects the front part of sclera except the cornea.	.....(ii) .....
.....(iii)	Choroid
.....(iv)	Lens
The inner layer which has photoreceptors.	.....(v) .....
.....(vi)	Ciliary muscles
The part of the retina where photoreceptors are absent.	.....(vii) .....
.....(viii)	Yellow spot

3. Redraw the figure of eye, identify and label the parts based on the peculiarities given below.



(a) The projected transparent anterior part of the sclera.

(b) The size of this part increases and decreases depending on the intensity of light.

(c) Presence of the pigment melanin gives this part a dark colour.

(d) The chamber filled with a fluid that helps to maintain the shape of the eye.

(e) The part which transmits impulses from photoreceptors to the visual centre in the brain.

4. The statements related to the fluids in the eye are given below. Tabulate them suitably and give title for each column.

- Seen in the chamber between the retina and the lens.
- Water like fluid.
- Provides oxygen and nourishment to the tissues of the eye.
- Jelly like substance.
- Helps in maintaining the shape of the eye.
- Filled in the chamber between the lens and the cornea.

5. The statements related to the distance of object from the eye is given below. Arrange the statements suitably below the picture. Give heading to the figure also.

(a) Ciliary muscles relax

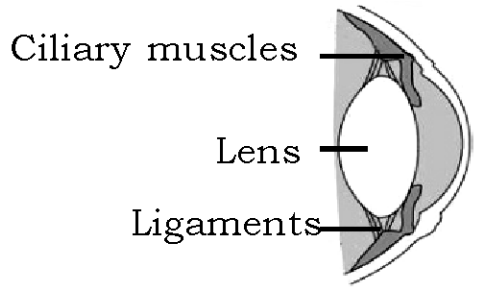
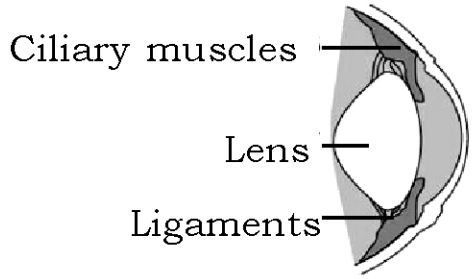
(b) Ligaments relax.

(c) Focal length decreases.

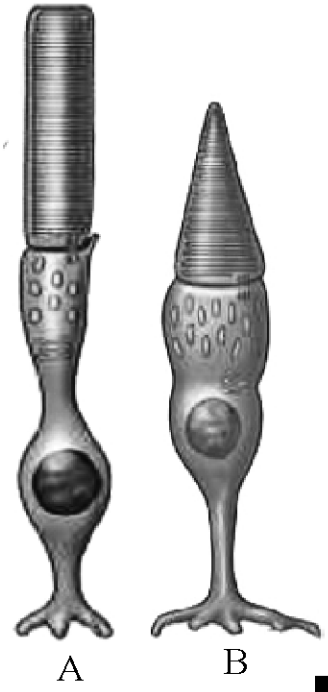
(d) Curvature of lens decreases.

(e) Ligaments stretch.

(f) Curvature of lens increases.

.....(i).....	.....(ii).....
	
.....	.....
.....	.....
.....	.....

6. Identify A and B and complete the table.



Photoreceptors	Shape	Visual Pigment	Function
A			
B			

7. Make corrections if any, in the underlined portions of the statements given below.

(a) The size of the pupil is regulated by the action of circular muscles and radial muscles seen in the iris.

(b) The radial muscles contract in intense light.

(c) When the circular muscles contract in intense light, the size of the pupil increases.

(d) The curvature of the cornea and the lens help light rays whichreflect from an object to get focussed on the retina.

8. Certain words related to the sense of sight are given below in the box. Prepare a flow chart showing the process of vision.

Optic nerve, Light, Lens, Cerebrum, Cornea, Retina, Aqueous humor, Vitreous humor, Impulse, Sense of sight,Pupil

9. The opinion of Ravi's Amma, after Ravi's lunch is given below.

"Today too you didn't eat vegetables. Don't you remember Doctor's words that vegetables are good for vision."

(a) Do you agree with Amma's opinion.

(b) Which component of vegetables is related to vision?

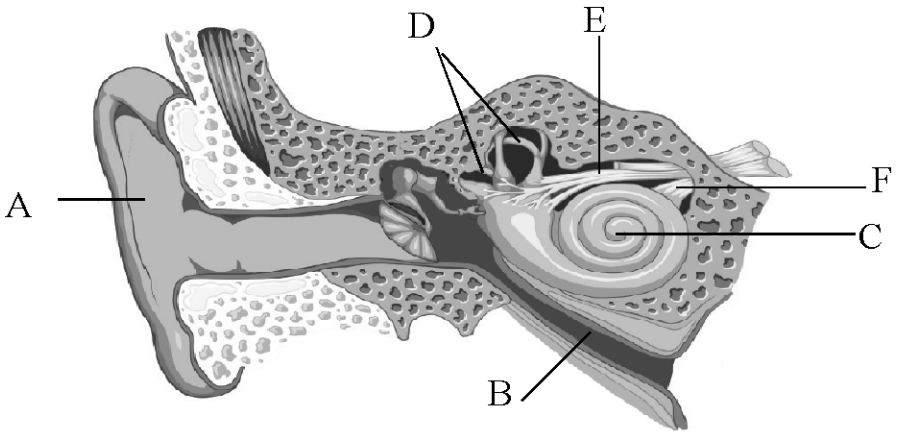
(c) How does its deficiency affect vision?

(d) What are the things to be taken care of, to ensure the health of eyes, other than food habits? (Any three)

10. Arrange column B,C in accordance with the column A.

A	B	C
(i) Glaucoma	(a) Is a condition in which the lens of the eyes become opaque resulting in blindness.	(1) Ensure the availability of vitamin A.
(ii) Cataract.	(b) The low production of retinal prevents the resynthesis of rhodopsin.	(2) Can be rectified by laser surgery.
(iii) Night blindness	(c) If the reabsorption of aqueous humor does not occur, causes damage to the retina and the photoreceptor cells and ultimately leads to blindness.	(3) This can be rectified by replacing the lens with an artificial one, through surgery.

11. Observe the figure of ear and answer the following questions.



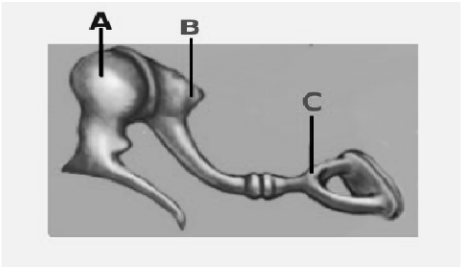
(a) Identify the parts indicated as A, B, C, D, E, F.

(b) What is the function of the part indicated as B?

(c) Name the part of internal ear which help in hearing.

(d) What are the functions of the part indicated as E,F ?

12. The given figure shows an important part of ear. Identify A, B, C and write their role in the hearing process.



13. Write the answer of the statements by using the words given in the box.

Auditory nerve, Endolymph, Basilar membrane, Oval window, Cochlea

(a) Tube coiled like snail shell seen in the inner ear.

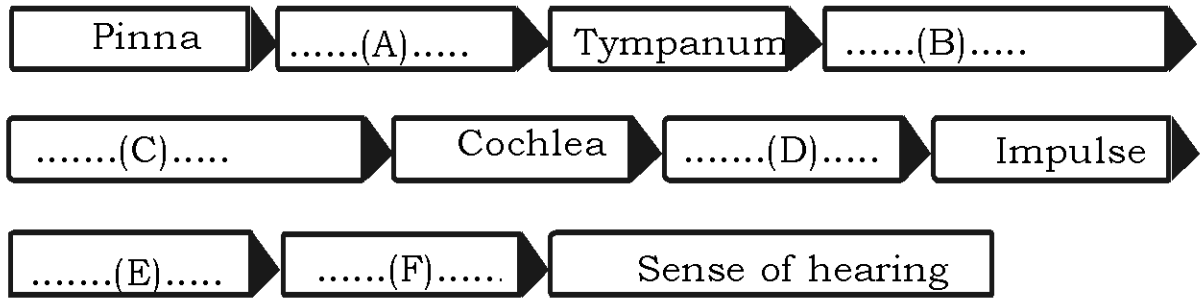
(b) The part in which specialized sensory hair cells are present.

(c) The part which spreads the vibration of ear ossicles to the inner ear.

(d) The fluid present in the space inside the membraneous labyrinth.

(e) The part which carry impulses from cochlea to cerebrum.

14. Complete the flowchart related to the sense of hearing.



15. Prepare a flow chart related to the equilibrium of the body is maintained.

- Impulses are transmitted by the vestibular nerves to the cerebellum.
- Causes movement of the sensory hair cells.
- Movements of head.
- The equilibrium of the body is maintained.
- Movement of the endolymph present inside the vestibule and the semicircular canals.
- Generates impulses.

16. Different steps involved in the process of sensing of taste is given below. Arrange them in sequentially.

(a) Generate impulses.

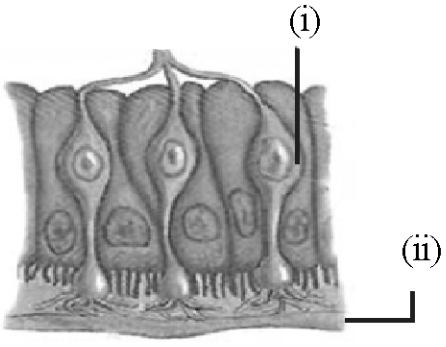
(b) We experience taste.

(c) Substances responsible for taste dissolve in saliva.

(d) Impulses reach the brain through the respective nerves.

(e) Stimulate the chemoreceptors.

17. Observe the figure and answer the following questions.



(a) Identify the receptor indicated as (i).

(b) Identify the part indicated as (ii). What is the role of this part in detecting smell?

(c) There is a possibility of not sensing

the taste of food, while suffering from common cold. Write reason.

18. The stages related to the experience of smell is given below. Arrange them in sequential order.

(a) Impulses are generated.

(b) Aromatic particles dissolve in the mucus inside the nostrils.

(c) Olfactory receptors stimulated.

(d) We experience smell.

(e) Aromatic particles diffuse in the air and enter the nostrils.

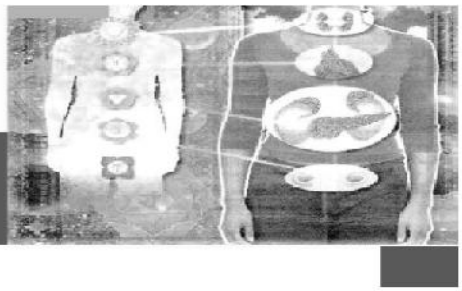
(f) Impulses are transmitted to the cerebrum through the olfactory nerve.

19. Make suitable pairs by using the words given in the box.

(Hint : Organism - Receptor)

Snake, Planaria, Jacobson's organ, Eye spot, Lateral line, Ommatidia, Shark, Housefly

3 Chemical Messages for Homeostasis



Main concepts

- The endocrine system is an organ system that controls and coordinates all activities in the body.
- Endocrine system includes endocrine glands and their secretions called hormones.

Hypothalamus
- Oxytocin
- Vasopressin
- Releasing hormone
- Inhibitory hormone

Pineal gland
- Melatonin

Pituitary gland
- Tropic hormone
- Growth hormone
- Prolactin

Parathyroid gland
- Parathormone

Thyroid gland
- Thyroxine
- Calcitonin

Thymus
- Thymosin

Adrenal gland

Cortex
- Aldosterone
- Cortisol

Medulla
- Epinephrine
- Norepinephrine

Pancreas

Alpha cells
- Glucagon

Beta cells
- Insulin

Ovary

(In Females)
- Estrogen
- Progesterone

Testis
- Testosterone

- The cells which are acted upon by hormones are their target cells.
- The normal level of glucose in blood is 70 -110 mg/100ml.
- The level of glucose in blood is maintained by the combined action of insulin and glucagon.
- Diabetes is clinically referred to as a condition when the level of glucose before breakfast is above 126mg/100ml of blood.
- The thyroid gland is the main endocrine gland that controls the metabolic activities.
- The normal level of calcium in blood is 9 -11 mg/100ml.
- The anterior lobe of the pituitary gland produces hormones which regulate the functions of other endocrine glands.
- When the production of vasopressin decreases, the reabsorption of water in the kidney is decreased and excess amount of urine is eliminated. This condition is known as diabetes insipidus.
- The ovary and testis secrete sex hormones.
- The chemical substances that are secreted by certain animals to the surroundings to facilitate communication are called pheromones.
- Plant hormones - Auxin, Cytokinin, Gibberellin, Abscisic acid, Ethylene.
- Artificial plant hormones - Auxins, Gibberellins, Ethylene (Ethyphon), Abscisic acid

WORKSHEETS

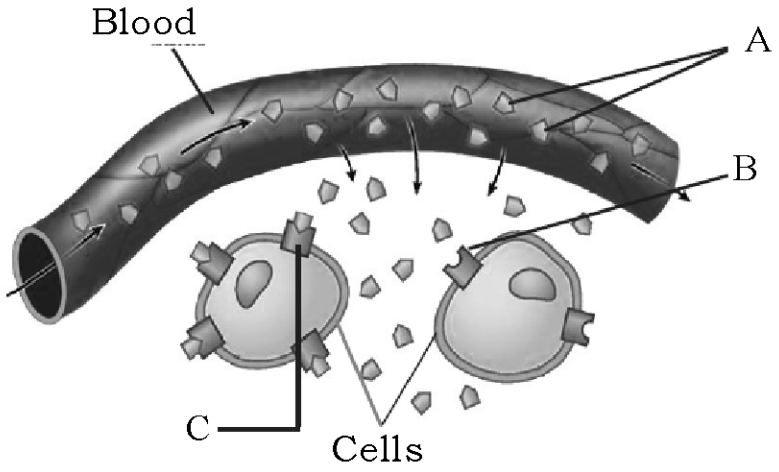
1. There is also another organ system in our body which controls and coordinates all activities like Nervous system.

(a) Which organ system is mentioned in the above statement?

(b) What does this system include?

(c) What act as chemical messenger to regulate cellular activities?

2. An illustration related to hormone in the target cell is given below. Analyse the illustration and answer the following questions.



(a) Identify the parts indicated as A,B.

(b) How the complex indicated as C is formed? What are the changes that occur in the cell by the formation of this complex?

3. Arrange the following statements suitably in the table given below.

(a) Cellular uptake of glucose molecules.

(b) The alpha cells in the Islets of Langerhans of Pancreas produce this hormone.

(c) Converts the glycogen stored in the liver to glucose.

(d) Synthesizes glucose from amino acids.

(e) Converts glucose into glycogen in the liver and muscles.

(f) The beta cells in Islets of Langerhans of Pancreas produce this hormone.

Insulin	Glucagon

4. The level of glucose in blood before breakfast is given in the table. Analyse the table and answer the questions given below.

Name	Level of glucose in blood (mg/100 ml)
Raju	105
Ravi	165
Meera	135
Joseph	60
John	93

(a) Name the persons who have normal level of glucose in blood.

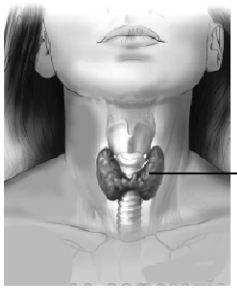
(b) Name the persons who are diabetic.

(c) What is the reason for increase in the level of glucose in blood?

(d) What are the symptoms of diabetes?

e) Describe the test which helps to find out the presence of glucose in urine.

5. Observe the illustration and answer the following questions.



Hormones
. Thyroxine
. Calcitonin

(a) Identify the gland.

(b) Where is this gland located?

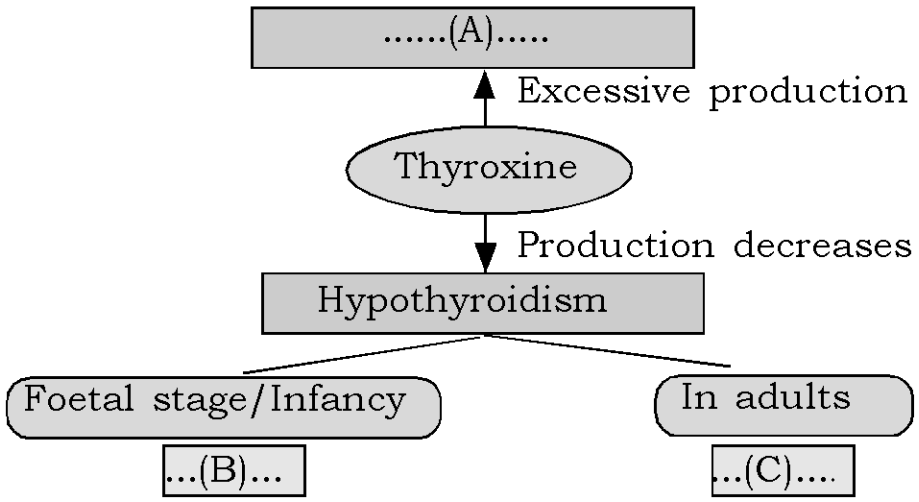
(c) How does the absence of iodine affect the function of this gland?

(d) (i) Of these two hormones which one performs the following functions?

- Raises the rate of metabolism.
- Increases energy production.

(ii) Write other two functions of this hormone.

6. Complete the illustration related to thyroxine.



7. Some symptoms due to the rise and fall of thyroxine level in our body are given below. Arrange them suitably in the table.

(a) Emotional imbalance.

(b) Low metabolic rate.

(c) Hypertension.

(d) Rise in body temperature.

(e) Inflammation in body tissues.

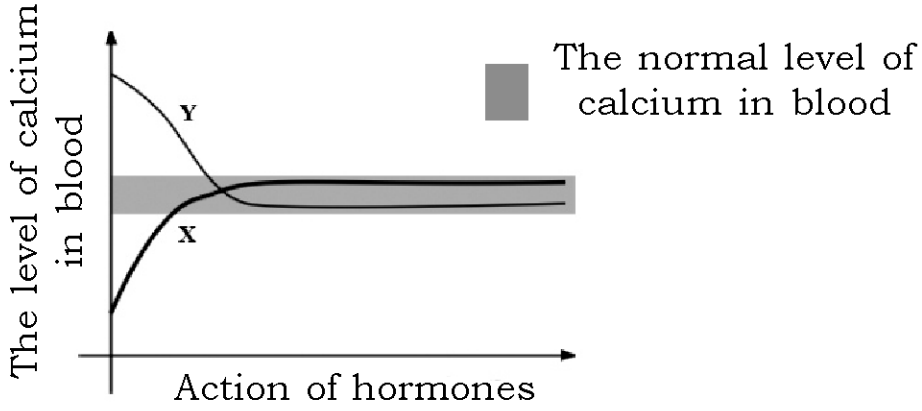
(f) Excessive sweating.

(g) Increase in body weight.

(h) Increased heart beat.

Hyperthyroidism	Hypothyroidism

8. Observe the graph and answer the following questions.



(a) What is the normal level of calcium in blood?

(b) Name the hormone which helps to regulate the calcium level to normal in the person indicated as X. What are the actions of this hormone?

(c) Name the hormone which helps to regulate the calcium level to normal in the person indicated as Y. What are the actions of this hormone?

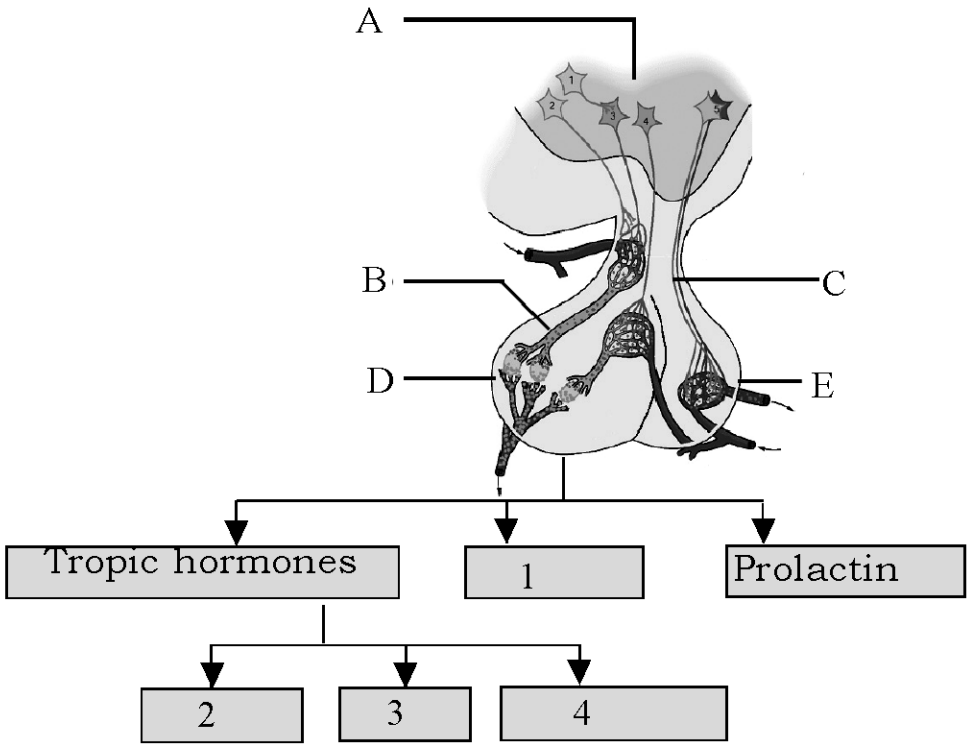
9. Complete the table related to adrenal gland.

	Hormone	Function
Medulla	Epinephrine	.....(A).....
	....(B).....	Acts along with epinephrine.
Cortex	Cortisol	.....(C).....
	Aldosterone	.....(D).....
	.....(E).....	Controls the development and functions of sex organs.

10. Make suitable pairs by using the words given in the box.

Thymus, Sperm production, Implantation of embryo in the uterus, To control the activities and maturation of T lympho-cytes, Pineal, Testosterone, Estrogen, Progesterone, Helps to maintain the rhythm of our daily activities, Ovulation

11. Observe the illustration and answer the following questions.



(a) Identify the parts indicated as A, B, C, D, E?

(b) What is the function of prolactin?

(c) The hormones produced by the part indicated as A and their functions are given in the box. Make suitable pairs.

Helps in the reabsorption of water in the kidney, Oxytocin, Releasing Hormone, Inhibits the production of tropic hormones in the anterior lobe of the pituitary gland, Facilitates child birth by stimulating the contraction of smooth muscles in the uterine wall, Vasopressin, Stimulates the anterior lobe of the pituitary gland and secretes tropic hormones, Inhibitory Hormone

(d) Identify the hormones indicated as 1,2,3,4 and complete the table suitably.

Hormone	Function
	promotes the growth of the body.
	stimulates the activity of the thyroid gland.
	stimulates the activity of testes in males and ovaries in females.
	stimulates the activity of adrenal cortex.

(e) How does the variation in the production of hormone indicated as **1** affect our body? Explain.

12. A statement from Gokul's science diary is given below. Analyse it and answer the following questions.

" The hormone which controls the excretion of water through urine, also maintains the normal water level of our body"

(a) Whch hormone is mentioned here?

(b) How does this hormone regulate the level of water in our body?

(c) Complete the table that shows how this hormone regulates the quantity of urine in summer and winter.

Indicators	Winter season/Rainy season	Summer season
Hormone production	A	C
Reabsorption of water in kidneys	B	increases
Quantity of urine	Raises the quantity of urine	D

(d) Which body activity has been affected when this hormone production decreases in our body ? What is this condition called?

13. **Bees and termites are maintaining the colony life by using some chemical substances as chemical messages.**

(a) What are these chemical substances ?

(b) Write the other uses of these chemical substances.

(b) Give other examples for these chemical substances.

14. Make suitable pairs by using the words given in the box.

Abscisic acid, Promoting the growth of terminal buds, Gibberellin, Auxin, Stimulates break down of stored food, Ethylene, Cell differentiation, Dormancy of embryo, Cytokinin, Ripening of leaves and fruits

15. Some statements related to artificial plant hormones are given below. Select their answers from the box.

Auxins, Gibberellins, Ethylene, Ethyphon, Abscisic acid

(a) The artificial plant hormone which is used for increasing fruit size in grapes and apple.

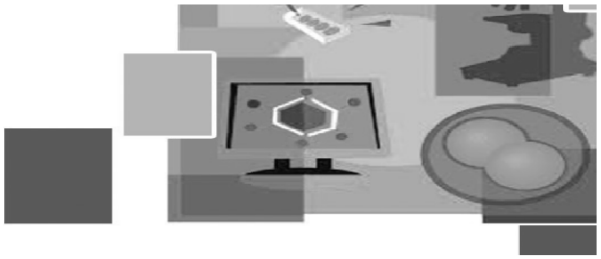
(b) The artificial plant hormone which is used for harvesting fruits at the same time.

(c) The artificial plant hormone which is used in the agricultural field to prevent the dropping of premature fruits.

(d) The artificial plant hormone which is used in rubber trees to increase the production of latex.

(e) The artificial plant hormone which is used for the ripening of tomato, lemon, orange etc.

4 Keeping Diseases Away



Main concepts

- The mode of transmission of diseases - By contact, Contaminated food and water, Cough, Sneezing, Unsterilized equipments, Vectors, Cloth etc.
- Bacteria enters the body and multiplies through binary fission. The toxins produced by them destroy cells and cause disease.
- Leptospira is the bacteria that causes rat fever.
- Diphtheria affects the mucus membrane of the nose and the throat. *Corynebacterium diphtheriae* is the pathogen.
- The bacteria *Mycobacterium tuberculosis* causes tuberculosis.
- Virus has the simple structure with a DNA or RNA molecule within a protein coat.
- HIV (Human Immuno deficiency Virus) enters the body and multiplies using the genetic mechanism of lymphocytes.
- Hepatitis is a liver disease. Hepatitis is also caused by virus.
- Malaria is a disease caused by protozoa.
- Filariasis is caused by filarial worms that are spread by Culex mosquitoes.
- Genetic diseases are caused by defects in the genes that control the cellular activities.
- Haemophilia, Sickle cell anaemia, etc. are examples of genetic diseases.
- Cancer is caused by the uncontrolled division of cells and their spread to other tissues.
- The changes in food habits, lack of physical exercise, mental stress, bad habits like consumption of alcohol, drug abuse, smoking, etc. lead to various lifestyle diseases.
- Animal Diseases - Anthrax, Inflammation of udder, Foot and mouth disease

- Plant Diseases - Blight disease in paddy, Wilt disease in brinjal, Mosaic disease in peas and tapioca, Bunchy top of banana, Quick wilt in pepper, Bud rot of coconut.

WORKSHEETS

1. Prepare a poster.

Covid 19, the infectious disease is caused by the most recently discovered Corona virus. The poster related to the steps taken to prevent the transmission of this disease is given below.

Prepare a poster related to the various modes of transmission of pathogens like virus from one person to another.

2. The statements related to some Bacterial diseases are given below. Arrange them suitably in the given table.

(a) *Corynebacterium diphtheriae* is the pathogen.

(b) Major Symptoms are loss of body weight, fatigue and persistent cough.

(c) BCG is used as preventive vaccine.

(d) Leptospira is the bacteria that causes this disease.

(e) Toxins produced by the bacteria cause fever, throat pain and inflammation in the lymph glands of the throat.

(f) When bacteria reach blood through wounds, they affect body cells and produce certain toxins.

(g) Cells in the mucus membrane which are destroyed by the toxins produce an ash coloured thick coating in the throat within two or three days.

(h) Severe fever, headache, muscle pain, redness in eyes, etc. are the major symptoms.

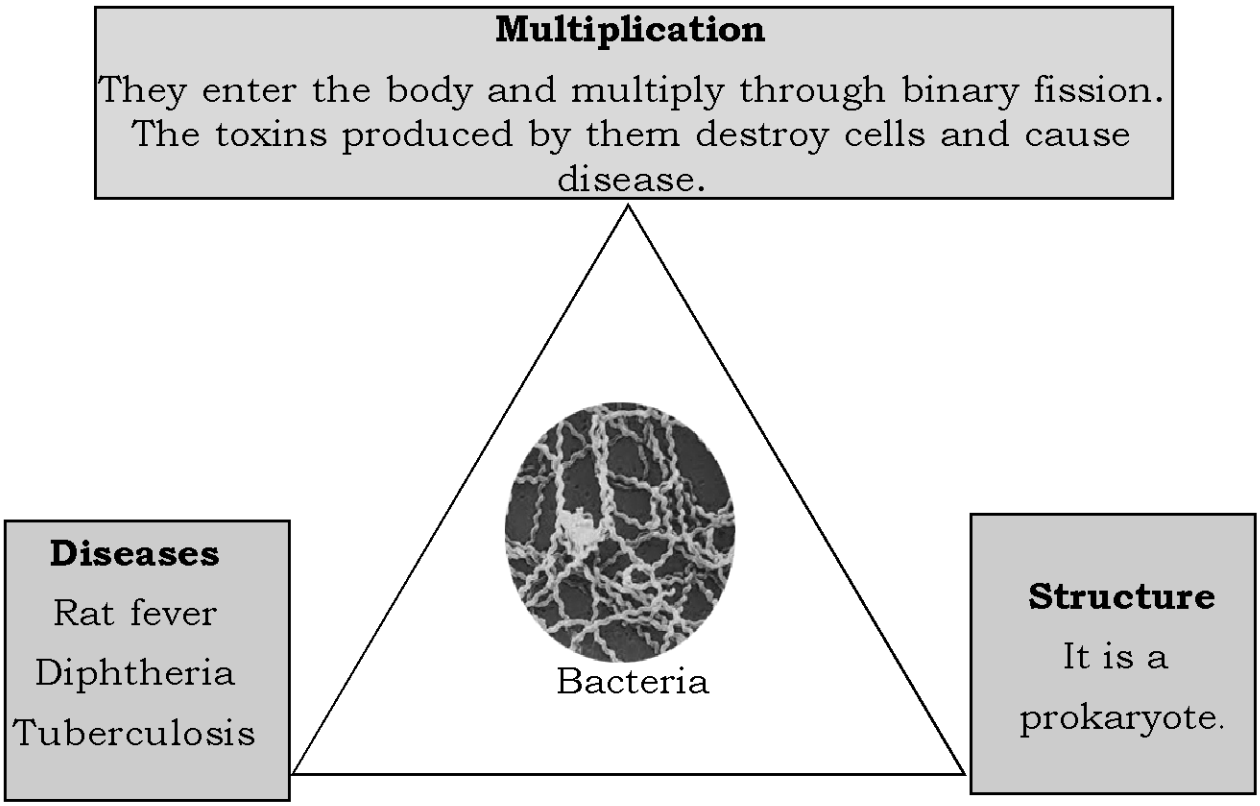
(i) *Mycobacterium tuberculosis* is the pathogen.

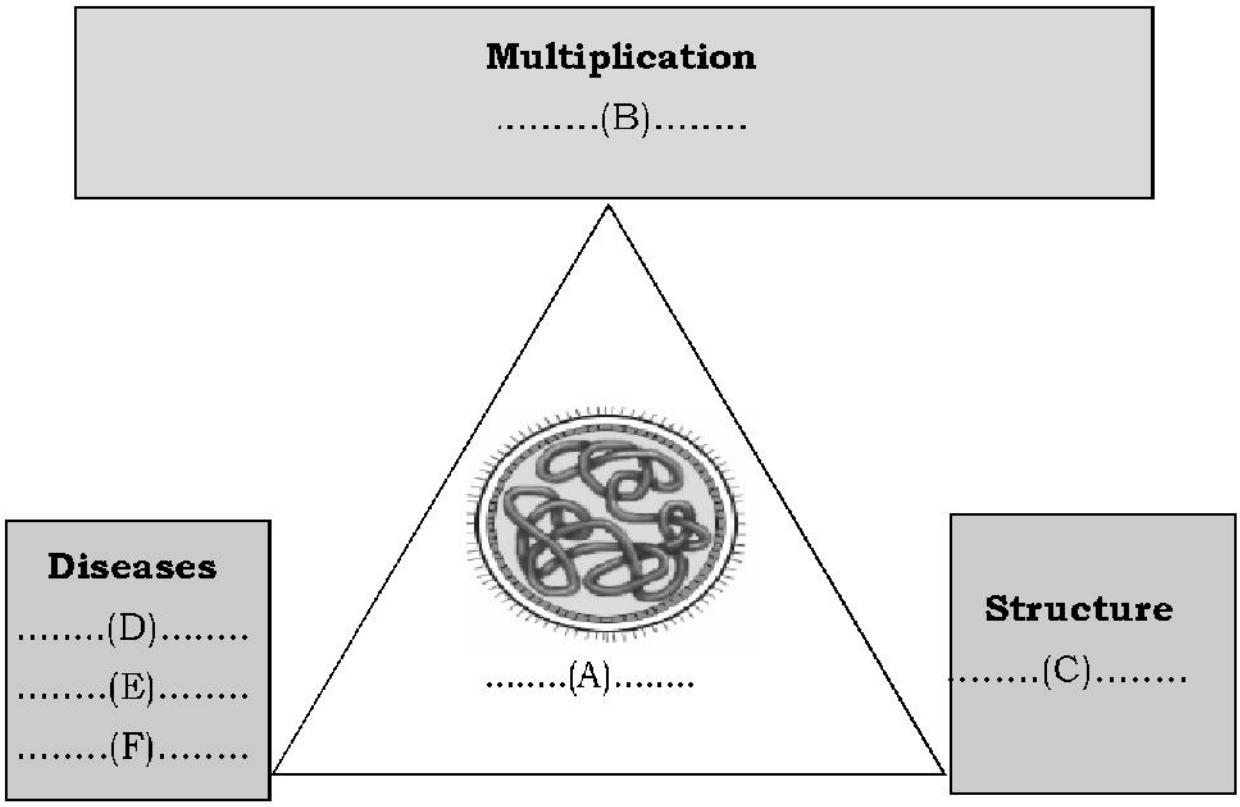
(j) This disease mainly affects the lungs.

(k) The disease which affects the mucus membrane of the nose and the throat.

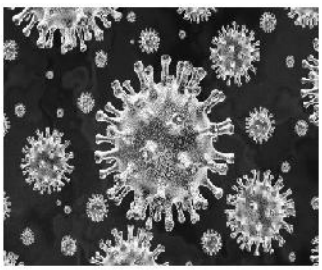
Rat fever	Tuberculosis	Diphtheria

3. Complete the illustration as the example given below.

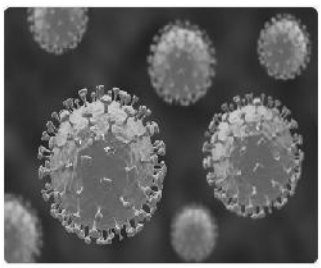




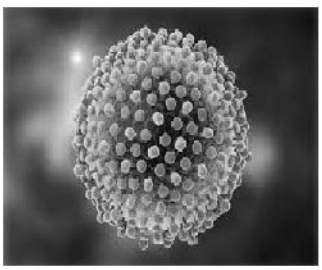
4. The pictures of some virus which is dreadful to the world is given below. Observe the picture and answer the questions given below.



Corona virus



Nipah virus



Hepatitis virus

(a) Which is the natural vector of Nipah virus? What are the various situations that enable the virus to enter humans?

(b) In Hepatitis patients, dark yellow colour is seen in the mucus membrane, white portion of the eyes and the nails. Write its reason.

(c) Name two viral diseases that are transmitted through mosquitoes.

5. Observe the picture and answer the questions given below.

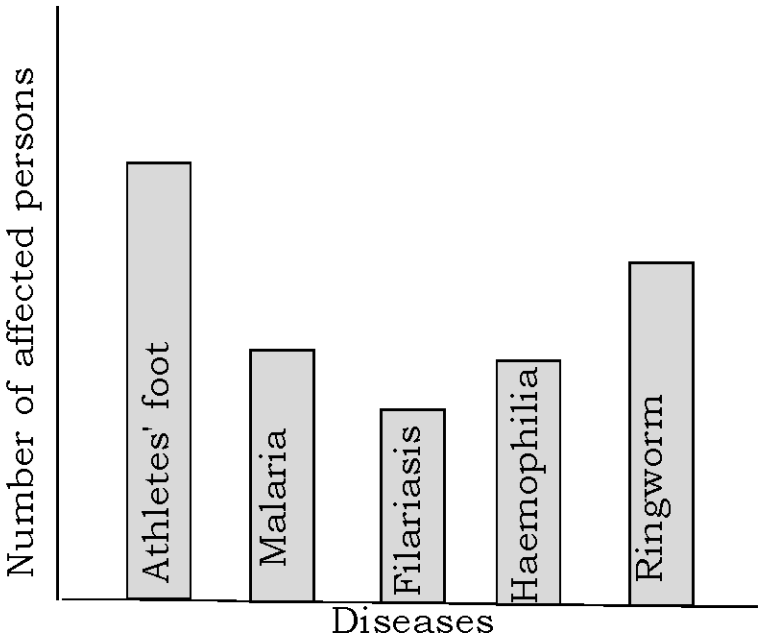
(a) Identify the pathogen. Name the disease spread by this pathogen.

(b) How does this pathogen multiply in the human body?

(c) What are the ways by which one gets infected with this pathogen?

(d) What are the ways through which this disease does not spread?

6. Observe the graph and answer the questions given below.



(a) Which is the most affected disease? How this disease is transmitted?

(b) Which is the least affected disease? Name the pathogen of this disease.

(c) Which is the odd one? Write the reason for this disease.

(d) Name the diseases caused by fungus.

(e) Name the pathogen of Malaria.

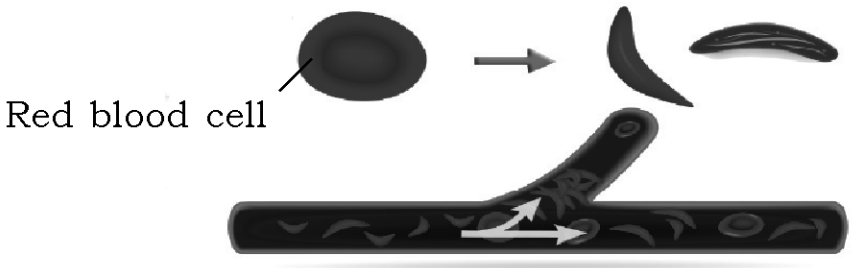
(f) Which disease transmissions can be prevented by observing dry day? Why?

7. Name of some diseases and their symptoms are given in the box. make suitable pairs.

Example : Malaria - High fever with shivering

Filariasis, Manifests as round red blisters on the skin, Swelling in the lymph ducts, Ring worm, Malaria, Appearance of reddish scaly rashes that cause itching, High fever with shivering, Athletes' foot

8. Observe the illustration related to genetic disease and answer the questions given below.



(a) Identify the disease.

(b) What is the cause of this disease?

(c) How does the deformity of red blood cells affect the body?

9. Observe the news and answer the questions given below.

Cancer and Kerala

Thiruvananthapuram : The studies conducted by the Regional Cancer Centre Thiruvananthapuram has revealed that every year there are more than 50000 newly affected cancer patients in Kerala. 50 percent of cancer in males are related to mouth, throat and lungs.....

(a) How are normal cells transform to cancerous cells? What are the factors that lead to cancer?

(b) The early diagnosis of cancer is important in treatment and cure. Why?

(c) What are the methods of treatment for cancer?

10. The names of certain lifestyle diseases are given in box A and their causes in box B. Make suitable pairs.

A
Diabetes, Fatty Liver, Stroke, Hypertension, Heart attack

B
Decrease in the diameter of arteries due to deposition of fat, Deficiency of insulin or its malfunctioning, Block of blood flow due to deposition of fat in coronary arteries which carry blood to the heart, Deposition of excess fat in the liver, Rupture of blood vessels in the brain and block of blood flow.

11. Select the correct pairs.

(a) Anthrax - Bacteria

(b) Foot and mouth disease - Fungus

(c) Inflammation of udder - Virus

(d) Anthrax - Virus

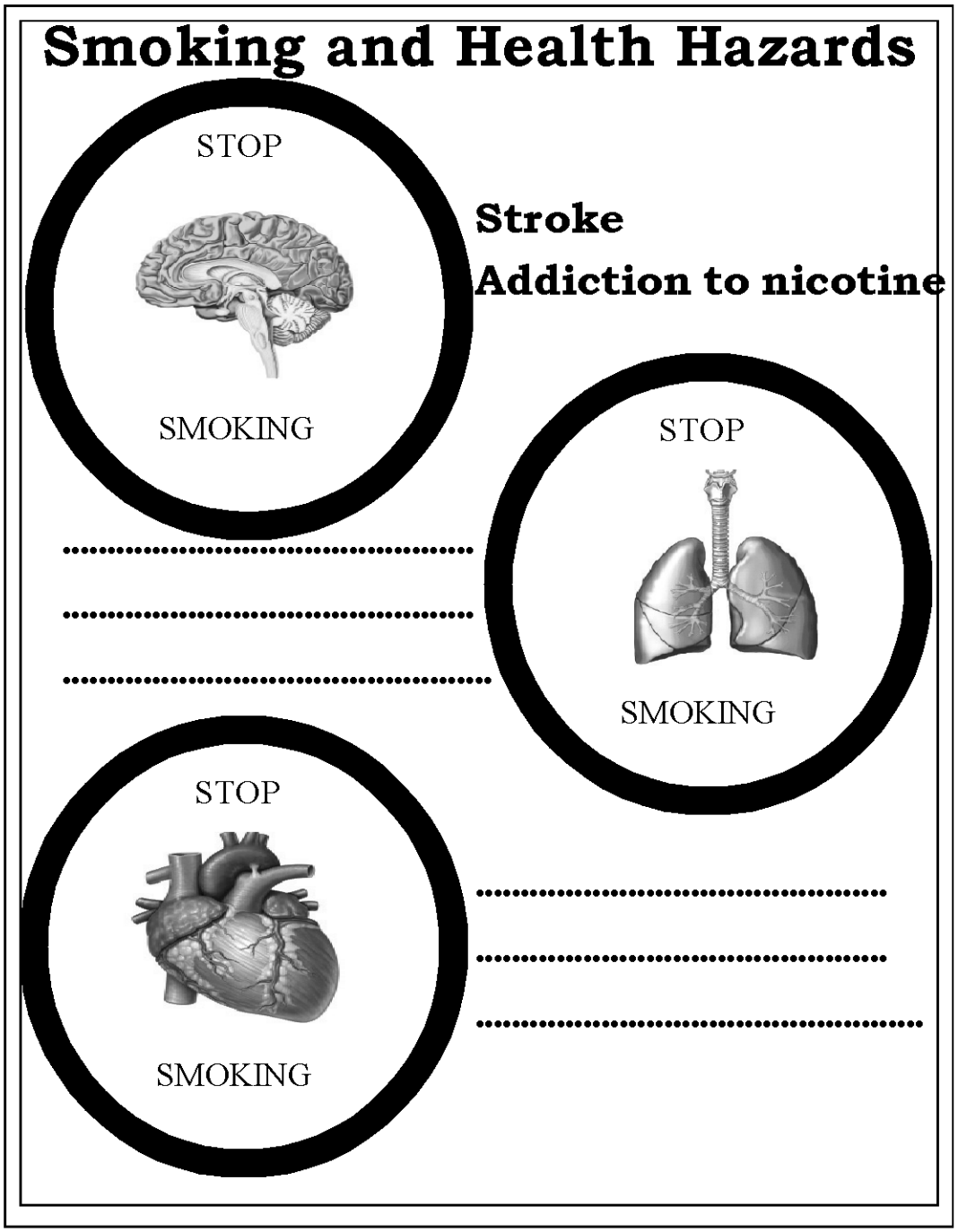
(e) Foot and mouth disease - Virus

(f) Inflammation of udder - Bacteria

12. Arrange column B, C in accordance with the column A.

A	B	C
Blight	Banana	Fungus
Bunchy top	Pepper	Bacteria
Quick wilt	Coconut	Protozoa
	Paddy	Virus

13. Complete the poster related to the topic - Smoking and health hazards.



1 Sensations and Responses

1. (a) Neuron

(b) (i) Part that receives impulses from adjacent neuron

(ii) Dendron

(iii) Axon

(iv) Carries impulses from the cell body to outside

(v) Axonite

(vi) Carries impulses to the synaptic knob

(vii) Synaptic knob

(viii) Secretes neurotransmitter

2. (A) Dendrite - Branches of Dendron

(C) Axonite - Branches of axon.

(E) Axon - Longest filament from the cell body

(F) Dendron - Short filament from the cell body.

(J) Synaptic knob - Tip of axonite.

3. (b) and (c) incorrect.

(b) The senses that evoke responses in organisms are called stimuli.

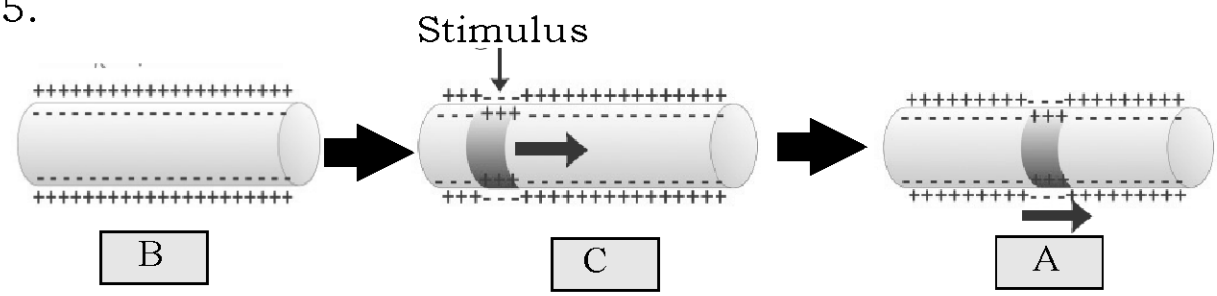
(c) Myelin sheath in the brain and the spinal cord is formed of specialized cells called oligodendrocytes.

4. (a) A - Axon B - Myelin sheath

(b) X - Schwann cell Y - Oligodendrocyte.

Myelin sheath in the nerves is formed of Schwann cells. Myelin sheath in the brain and the spinal cord is formed of specialized cells called oligodendrocytes.

5.



6. (a) (i) Synaptic knob (ii) Dendrite

(b) (iii) Synapse/Synaptic cleft, Synapse helps to regulate the speed and direction of impulses.

(c) Acetylcholine and dopamine are examples of neurotransmitters.

(d) When electric impulses from the axon reach the synaptic knob, certain chemical substances are secreted from there to the synaptic cleft. These chemical substances are called neurotransmitters. They stimulate the adjacent dendrite or cell and new electric impulses are generated.

(e) (i) Dendron (ii) Axon (iii) Synaptic knob (iv) Synapse

7. (c) Carries impulses from brain and spinal cord to various parts of the body.

8. (a) Brain - Central nervous system

(d) Spinal nerves - 31 pairs

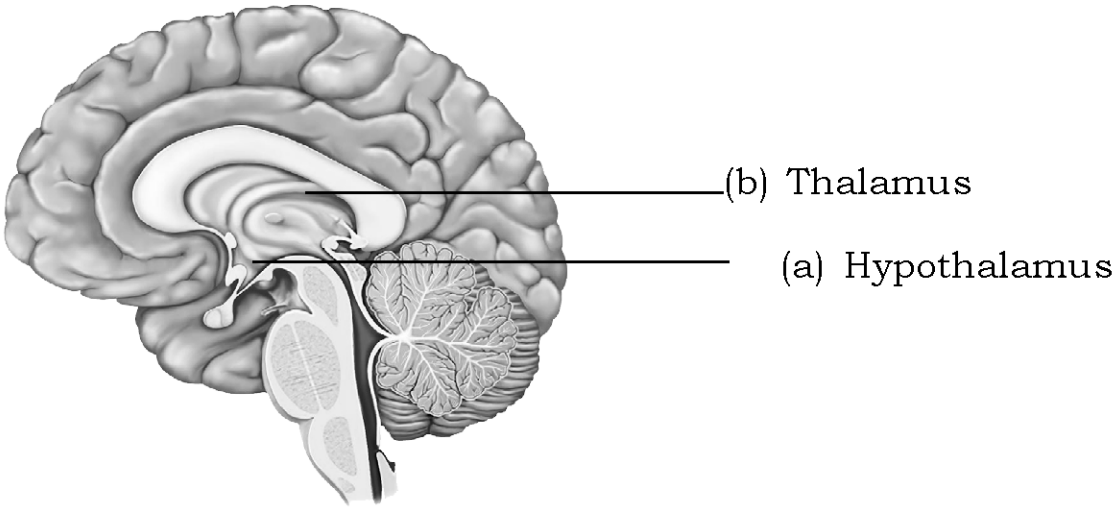
(e) Spinal nerves - Peripheral nervous system

9. (a) A - Cerebrum B - Cerebellum C - Medulla oblongata

(b)

Cerebrum	Cerebellum	Medulla oblongata
(ii) Controls voluntary movements. (v) Centre of thought, intelligence, memory and imagination. (viii) Evokes sensations.	(i) Seen behind the cerebrum as two flaps. (iii) Coordinates muscular activities and maintains equilibrium of the body. (vi) Fissures and grooves are present. (x) The second largest part of the brain.	(iv) The rod shaped part seen below the cerebrum, located near the cerebellum. (vii) Controls heart beat. (ix) Controls involuntary actions.

(c)



10. (a) Yes, agree with the statement.

-formed from the blood in the brain

-reabsorbs into the blood.

(b) Cerebro spinal fluid-

(c) In the ventricles of brain,central canal of the spinal cord, between the membranes of meninges.

11. (a) Spinal cord

(b) The spinal cord is protected inside the vertebral column.The spinal cord is covered by meninges.

(c) Impulses from different parts of the body are transmitted to and from the brain through the spinal cord. Mainly spinal cord acts as the centre of reflex action. It also coordinates the repeated movements during walking, running etc.

(d) (i) Dorsal root (ii) Ventral root

Sensory impulses reach the spinal cord through the dorsal root. Motor impulses go out of the spinal cord through the ventral root.

(e) Cerebrospinal fluid, The functions of the cerebrospinal fluid are to provide nutrients and oxygen to the tissues of the brain and spinal cord, regulate the pressure inside the brain and to protect the brain from injuries.

12. (a) 1 - Sensory neuron 2- Interneuron 3 - Motor neuron
4 - Related muscle

(b) Reflex arc is the pathway of impulses in the reflex action.

(c) (iii) Receptor - Generates impulses.

(v) Sensory neuron - Carries impulses to the spinal cord.

(i) Interneuron - Generates quick responses according to the sensory impulses.

(iv) Motor neuron - Carries the information from spinal cord to related muscles

(ii) Related muscle - Withdraws the hand by the action of the muscles.

13. (a) We blink our eyes when objects move towards them.- CR

(b) Spinal cord acts as the centre of reflex action.- SR

(c) Sudden withdrawal of leg while piercing a thorn.- SR

(d) Reflexes that are under the control of the cerebrum.- CR

(e) We blink our eyes when light suddenly falls on our eyes.- CR

14. (a) Heart beat becomes normal, others are the actions of sympathetic system.

(b) Urinary bladder contracts, others are the actions of sympathetic system.

(c) Trachea expands, others are the actions of parasympathetic system.

(d) The pupil in the eye contracts, others are the actions of sympathetic system.

(e) Production of hormone increases, others are the actions of parasympathetic system.

15. (i) Alzheimer's - (c) Accumulation of an insoluble protein in the neural tissues of the brain. Neurons get destroyed. - (2) Loss of memory, inability to recognize friends and relatives, inability to do routine works.

(ii) Epilepsy - (a) Continuous and irregular flow of electric charges in the brain. - (3) Fits due to continuous muscular contraction, frothy discharge from the mouth, clenching of the teeth following which the patient falls unconscious.

(iii) Parkinsons - (b) Destruction of specialised ganglions in the brain. Production of dopamine, a neurotransmitter in the brain gets reduced.-(1) Loss of body balance, irregular movement of muscles, shivering of the body, profuse salivation.

2 Windows Of Knowledge

1. (a) External eye muscles

(b) Protects the eyes from dust and sweat.

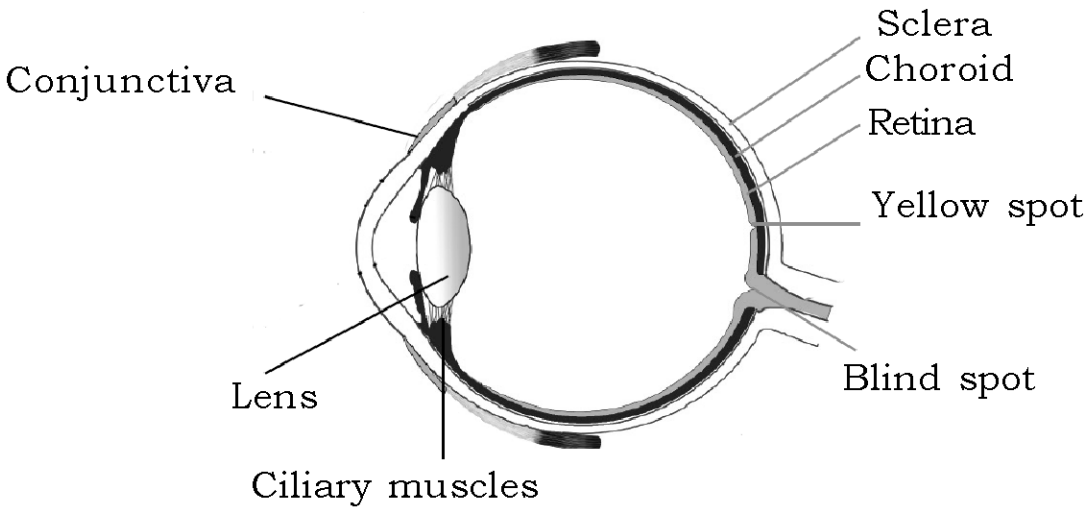
(c) Protect the eyes from dust.

(d) Protect the eyes from dust and external shocks.

(e) Tears

(f) Secretes mucus which protects the anterior portion of the eye ball from being dry.

2 (a)



(b) (i) Sclera

(ii) Conjunctiva

(iii) The middle layer which contains a large number of blood vessels.

(iv) Elastic transparent convex part.

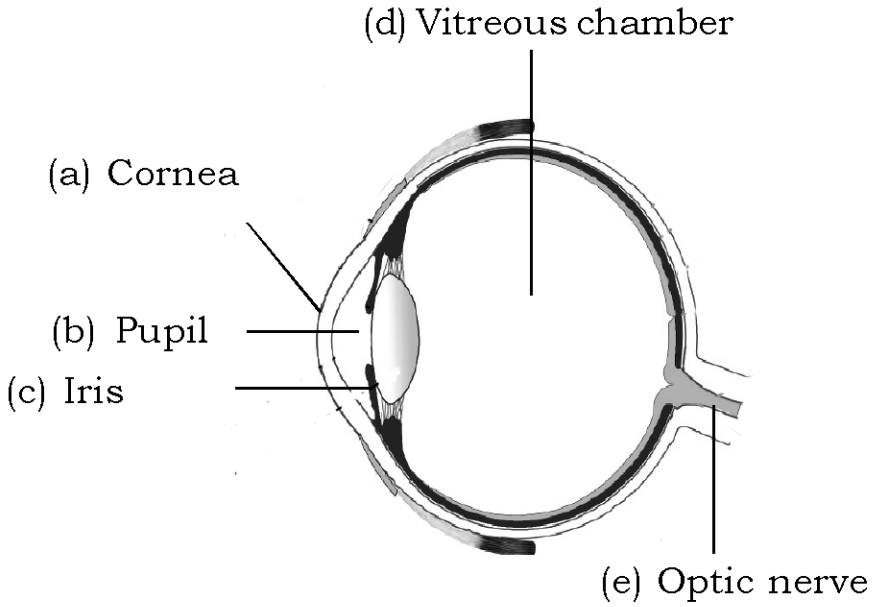
(v) Retina

(vi) Circular muscles seen around the lens. The contraction and relaxation of these muscles alter the curvature of lens.

(vii) Blind spot

(viii) The part of the retina where plenty of photoreceptors are present.

3.



4.

Aqueous humor	Vitreous humor
Water like fluid.	Jelly like substance.
Filled in the chamber between the lens and the cornea.	Seen in the chamber between the retina and the lens.
Provides oxygen and nourishment to the tissues of the eye.	Helps in maintaining the shape of the eye.

5.

(i) While viewing distant objects	(ii) While viewing nearby objects
(a) Ciliary muscles relax.	(b) Ligaments relax.
(d) Curvature of lens decreases.	(c) Focal length decreases.
(e) Ligaments stretch.	(f) Curvature of lens increases.

6. A - Rod cells

   Shape- rod shaped

   Visual pigment - Rhodopsin

   Function - Able to see objects in dim light, cells cannot detect colour.

   B - Cone cells

   Shape- Cone shaped

   Visual pigment - Photopsin (iodopsin)

   Function - Provide us with colour vision.

7. b, c wrong.

   (b) The radial muscles contract in dim light.

   (c) When the circular muscles contract in intense light, the size of the pupil decreases.

8. Light → Cornea → Aqueous humor → Pupil → Lens → Vitreous humor → Retina → Impulse → Optic nerve → Cerebrum → Sense of sight

9. (a) Agree with the opinion.

   (b) Vitamin A

   (c) The retinal, a part of the visual pigment, is derived from Vitamin A. The deficiency of Vitamin A results in the low production of retinal. This in turn prevents the resynthesis of rhodopsin. In this condition, objects cannot be seen clearly in dim light and this disease is called night blindness. If there is a prolonged deficiency of Vitamin A, the conjunctiva and cornea become dry and opaque. This causes xerophthalmia and leads ultimately to blindness.

   (d) Personal hygiene, Do not watch Television or other screens continuously, Do not read under dim light, Wash your eyes frequently.(any three)

10. (i) Glaucoma - (c) If the reabsorption of aqueous humor does not occur, causes damage to the retina and the photore-

ceptor cells and ultimately leads to blindness - (2) Can be rectified by laser surgery.

(ii) Cataract - (a) Is a condition in which the lens of the eyes become opaque resulting in blindness. - (3) This can be rectified by replacing the lens with an artificial one, through surgery.

(iii) Night blindness - (b) The low production of retinal prevents the resynthesis of rhodopsin. - (1) Ensure the availability of vitamin A.

11. (a) A - Pinna B - Eustachian tube C - Cochlea
D - Semicircular canals E - Vestibular nerve
F - Auditory nerve

(b) Eustachian tube - Protects the tympanum by balancing the pressure on either side of the tympanum.

(c) Cochlea

(d) E - Vestibular nerve - Carry impulses related to the maintaining of equilibrium of the body to cerebellum.

F - Auditory nerve - Carry impulses related to hearing to cerebrum.

12. A - Malleus B - Incus C - Stapes

Ear ossicles - Amplify and transmit the vibrations of the tympanum to the internal ear.

13. (a) Cochlea

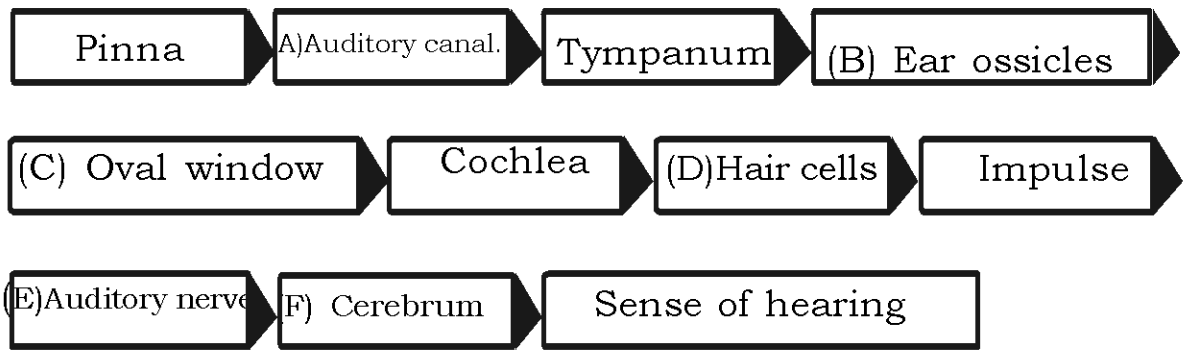
(b) Basilar membrane

(c) Oval window

(d) Endolymph

(e) Auditory nerve

14.



15. Movements of the head → Movement of the endolymph present inside the vestibule and the semicircular canals →Causes movement of the sensory hair cells → Generates impulses → Impulses are transmitted by the vestibular nerves to the cerebellum →The equilibrium of the body is maintained

16. (c) Substances responsible for taste dissolve in saliva.
    (e) Stimulate the chemoreceptors.
    (a) Generate impulses.
    (d) Impulses reach the brain through the respective nerves.
    (b) We experience taste.

17. (a) i - Olfactory receptors
    (b) Mucus

    The smell of various substances diffuse in the air and enter the nostrils along with the inhaled air. These aromatic particles dissolve in the mucus inside the nostrils, stimulate olfactory receptors and generate impulses.

    (c) Smell and taste are interrelated.The smell of various substances diffuse in the air and enter the nostrils along with the inhaled air. These aromatic particles dissolve in the mucus inside the nostrils, stimulate olfactory receptors and generate impulses. While suffering from common cold the amount of mucus increases. So the aromatic particles cannot dissolve in the mucus inside the nostrils to stimulate olfactory receptors.

18. (e) Aromatic particles diffuse in the air and enter the nostrils.
    (b) Aromatic particles dissolve in the mucus inside the nostrils.
    (c) Olfactory receptors stimulated.
    (a) Impulses are generated.
    (f) Impulses are transmitted to the cerebrum through the olfactory nerve.
    (d) We experience smell.

19. Planaria - Eye spot, Housefly - Ommatidia, Shark - Lateral line, Snake - Jacobson's organ

3 Chemical Messages for Homeostasis

1. (a) Endocrine system

   (b) The endocrine system includes endocrine glands and their secretions called hormones.

   (c) Hormones are chemical messengers that regulate cellular activities.

2. (a) A - Hormone molecules B - Hormone receptor in the cell membrane

   (b) Hormones reach every cell in the body as they are transported by blood. But each hormone acts only upon those cells which have specific receptors. Each hormone molecule binds with the receptor to form a hormone-receptor complex. Following this, enzymes are activated within the cell and certain changes occur in cellular activities.

3. **Insulin**

   (a) Cellular uptake of glucose molecules.(e) Converts glucose into glycogen in the liver and muscles. (f) The beta cells in Islets of Langerhans of Pancreas produce this hormone.

   Glucagon

   (b) The alpha cells in the Islets of Langerhans of Pancreas produce this hormone.

   (c) Converts the glycogen stored in the liver to glucose.

   (d) Synthesizes glucose from amino acids.

4. (a) Raju, John

   (b) Ravi, Meera

   (c) Decreased production of insulin due to the destruction of beta cells or the inability of cells to utilize the insulin produced, raises the level of glucose in blood.

   (d) Increased appetite and thirst and frequent urination are the major symptoms of diabetes.

   (e) Benedict test - Take 2ml of the sample in a test tube. Add 2ml Benedict solution into it. Heat for 2 minutes. Observe the change in colour. Formulate your inference by comparing the glucose indicator on the reagent bottle.

5. (a) Thyroid gland

   (b) In the throat just below the larynx.

   (c) Iodine is essential for the production of thyroxine. The production of thyroxine is blocked in the absence of iodine. In an attempt to produce more thyroxine, the thyroid gland enlarges. This condition is called goitre.

   (d) (i) Thyroxine

   (ii) Accelerates the growth and development of the brain in the foetal stage and infancy, Regulates growth in children.

6. (A) Hyperthyroidism

   (B) Cretinism

   (C) Myxoedema

7. Hyperthyroidism - (a) Emotional imbalance (d) Rise in body temperature (f) Excessive sweating (h) Increased heart beat.

   Hypothyroidism - (b) Low metabolic rate (c) Hypertension (e) Inflammation in body tissues (g) Increase in body weight.

8. (a) The normal level of calcium in blood is 9-11 mg/100ml.

   (b) Parathormone secreted by Parathyroid gland.

   Reabsorbs calcium from kidneys to blood, Prevents the storage of calcium in bones.

   (c) Calcitonin secreted by Thyroid gland.

   Prevents the process of mixing of calcium from bones to blood, Stores the excess calcium from blood to bones.

9. (A) Acts along with the sympathetic nervous system during emergency. Thus, we can resist or withdraw ourselves from such situations.(B) Norepinephrine (Noradrenaline) (C) The synthesis of glucose from protein and fat. Slows down the action of defense cells. Controls inflammation and allergy.(D) Maintains the salt- water level by acting in kidneys. Maintains blood pressure.(E) Sex hormones

10. Thymus - To control the activities and maturation of T lymphocytes, Pineal - Helps to maintain the rhythm of our daily activities, Testosterone - Sperm production, Estrogen - Ovulation, Progesterone - Implantation of embryo in the uterus

11. (a) A- Hypothalamus B - Portal vein C - Nerve fibre D - Anterior lobe of pituitary E - Posterior lobe of pituitary

(b) Production of milk

(c) **Oxytocin**- Facilitates child birth by stimulating the contraction of smooth muscles in the uterine wall.

Vasopressin - Helps in the reabsorption of water in the kidney.

Releasing Hormone - Stimulates the anterior lobe of the pituitary gland and secretes tropic hormones.

Inhibitory Hormone - Inhibits the production of tropic hormones in the anterior lobe of the pituitary gland.

(d) 1- Growth hormone/Somatotropin/ Somato Tropic Hormone/ GH 2,3,4 - Thyroid Stimulating Hormone (TSH), Gonado Tropic Hormone (GTH), Adreno Cortico Tropic Hormone (ACTH)

Growth Hormone - promotes the growth of the body.

Thyroid Stimulating Hormone (TSH) - stimulates the activity of the thyroid gland.

Adreno Cortico Tropic Hormone (ACTH) - stimulates the activity of adrenal cortex.

Gonado Tropic Hormone (GTH) - stimulates the activity of testes in males and ovaries in females.

(e) If the production of somatotropin increases during the growth phase, it leads to the excessive growth of the body. This condition is called Gigantism. It leads to another stage called Dwarfism when its production decreases during the growth phase. Acromegaly is the condition caused by the excessive production of somatotropin after the growth phase. It is characterised by the growth of the bones on the face, jaws and fingers.

12. (a) Vasopressin or Anti Diuretic Hormone (ADH)

(b) Vasopressin regulates the level of water in the body through the reabsorption of water in kidneys. The production of vasopressin is high in the summer season during which water loss is excessive through sweat. But its production is less during the winter and rainy season.

(c) (A) Decreases (B) Decreases (C) Increases (D) The quantity of urine is less.

(d) When the production of vasopressin decreases, the reabsorption of water in the kidney is decreased and excess

amount of urine is eliminated. This condition is known as diabetes insipidus.

13. (a) Pheromones.

(b) Pheromones help in attracting mates, informing the availability of food, determining the path of travel, signalling dangers etc.

(c) The muscone in the musk deer, the civeton in the civet cat, bombykol in the female silk worm moth etc., are examples for pheromones.

14. Abscisic acid - Dormancy of embryo

Auxin - Promoting the growth of terminal buds

Gibberellin - Stimulates break down of stored food

Ethylene - Ripening of leaves and fruits

Cytokinin -Cell differentiation.

15. (a) Gibberellins

(b) Abscisic acid

(c) Auxins

(d) Ethyphon

(e) Ethylene

4 Keeping Diseases Away

1. The ideas related to the mode of transmission of diseases- By contact, Contaminated food and water, Cough, Sneezing, Unsterilized equipments, Vectors, Cloth etc.

2.

Rat fever	Tuberculosis	Diphtheria
(d) Leptospira is the bacteria that causes this disease. (f) When bacteria reach blood through wounds, they affect body cells and produce certain toxins. (h) Severe fever, headache, muscle pain, redness in eyes, etc. are the major symptoms.	(b) Major Symptoms are loss of body weight, fatigue and persistent cough. (c) BCG is used as preventive vaccine. (i) *Mycobacterium tuberculosis* is the pathogen. (j) This disease mainly affects the lungs.	(a) *Corynebacterium diphtheriae* is the pathogen. (e) Toxins produced by the bacteria cause fever, throat pain and inflammation in the lymph glands of the throat. (g) Cells in the mucus membrane which are destroyed by the toxins produce an ash coloured thick coating in the throat within two or three days. (k) The disease which affects the mucus membrane of the nose and the throat.

3. (A) Virus

   (B) Multiplies by taking control over the genetic mechanism of the host cells.

   (C) Has the simple structure with a DNA or RNA molecule within a protein coat. Has no cell organelles as seen in normal cells.

   (D)(E)(F) - Nipah, AIDS, Hepatitis, Dengue fever, Chikungunya (any viral disease) (any three).

4. (a) Fruit eating bats act as the Nipah virus vectors.

   From the saliva and urine of fruit eating bats that is seen in the remains of fruits eaten by bats Niph virus enter humans and pigs, From pigs also Nipah virus transmits to humans.

(b) When the flow of bile secreted by the liver is blocked, an increase in the level of bile pigment called bilirubin in blood is noticed. This imparts dark yellow colour to the mucus membrane, white portion of the eyes and the nails.

(c) Dengue fever and Chikungunya

5. (a) HIV (Human Immuno deficiency Virus)

AIDS (Acquired Immuno Deficiency Syndrome)

(b) HIV (Human Immuno deficiency Virus) enters the body and multiplies using the genetic mechanism of lymphocytes. Hence the number of lymphocytes decreases considerably and reduces the immunity of the body.

(c) Through sexual contact with HIV infected person, From HIV infected mother to the foetus, By sharing needle and syringe contaminated with HIV components, Through the reception of blood and organs contaminated with HIV.

(d)
- by touch, shaking hands, coughing, sneezing etc.
- through insects like mosquitoes, houseflies etc.
- by staying together and sharing food.
- by using the same toilet.
- by taking bath in the same pond.

6. (a) Athletes' foot. Pathogens enter through the toes when they come in contact with contaminated water and soil.

(b) Filariasis. Filarial worms.

(c) Haemophilia

Genetic disease/Blood clots with the help of some proteins present in blood plasma. The genes that control synthesis of protein which helps in blood clotting become defective.

(d) Ringworm, Athletes' foot

(e) Plasmodium/ Protozoa

(f) Malaria and Filariasis

The vector of Malaria is female Anopheles mosquito.

Filariasis is caused by filarial worms that are spread by Culex mosquitoes.

7. Filariasis - Swelling in the lymph ducts

Ring worm - Manifests as round red blisters on the skin

Athletes' foot - Appearance of reddish scaly rashes that cause itching.

8. (a) Sickle cell anaemia

(b) The defects in genes may also cause deformities in the sequencing of amino acids which are the building blocks of haemoglobin. As a result of this, the structure of haemoglobin changes and this in turn decreases its oxygen carrying capacity.

(c) In Sickle cell anaemia patients, the red blood cells bend like sickle. The oxygen carrying capacity of red blood cells decreases. The sickle shaped RBCs get collected in the blood vessels and block the flow of blood in them.

9. (a) The normal cells get transformed into cancerous cells when the control system of cell division fails. This may be due to environmental factors, smoking, radiations, virus, hereditary factors, etc.

(b) The disease may become complicated with the spread of cancer cells to other parts of the body through blood and lymph. As recovery from the disease is difficult if the disease becomes severe, early diagnosis of the disease is crucial in the treatment of cancer.

(c) Surgery, chemotherapy, radiation therapy etc., are extensively used in the treatment of cancer.

10. Diabetes - Deficiency of insulin or its malfunctioning.

Fatty Liver - Deposition of excess fat in the liver.

Stroke - Rupture of blood vessels in the brain and block of blood flow.

Hypertension - Decrease in the diameter of arteries due to deposition of fat.

Heart attack - Block of blood flow due to deposition of fat in coronary arteries which carry blood to the heart.

11. (a) Anthrax - Bacteria

(e) Foot and mouth disease - Virus

(f) Inflammation of udder - Bacteria

12. Blight - Paddy - Bacteria

Bunchy top - Banana - Virus

Quick wilt- Pepper - Fungus

13. Lungs - Lung cancer, Bronchitis, Emphysema.

Heart - Hypertension, Loss of elasticity of arteries, Decrease in functional efficiency.