Unit 5

Nervous System and Endocrine System

We perform many various types of functions everyday. Just like opening and closing of our eyes, movement of hands, standing up, sitting down etc. We can see these processes. While some processes are those, which we can't see. Just like to think, to learn, to remember etc. While some processes are those, which we can feel only like to hurt, to become hungry to become thirsty etc.

Discuss with your friends and answer these questions :

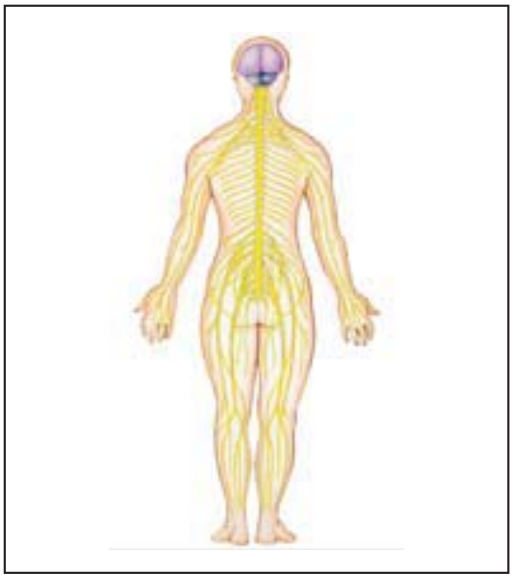
- Why do we use woolen clothes during winter ?

- When do we take water ?

- Why do we take rest ?

How do these processes are regulated in our body ? Let us understand.

In humanbody different organ systems work differently. Humanbody can work properly only if it works as a unit. This regulation can be done only with the help of nervous system (with the help of endocrine system).



The nervous system comprises brain, spinal cord and the nerves arising from them.

The nervous system coordinates and regulates all the processes of our body. Nervous system contains many nerves.

Nerves are connected with all the parts of our body. All the parts of body are regulated with the help of these nerves. Nerves comprise of highly specialized cells, called the neurons.

On the basis of the functions nervous systems can be classified in to three major parts.

1. Central Nervous System

2. Peripheral Nervous System

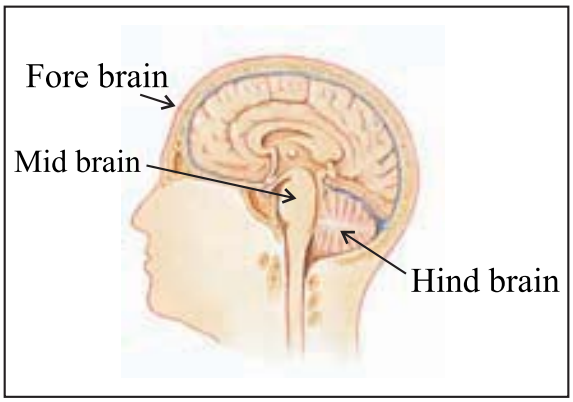
3. Sense Organs

1. Central Nervous System :

It is comprised of brain and spinal cord.

Brain :

Brain is main organ of the nervous system.



Brain is divisible in to three parts :

(1) Fore brain (2) Mid brain (3) Hind brain

(1) Fore brain : It forms the greater part of the brain. It possess the centers for the functions like speech, thoughts, memory and identification.

(2) Mid brain : It contains the centers for controlling the organs like hands, legs, and other organs. And thus it balances the body.

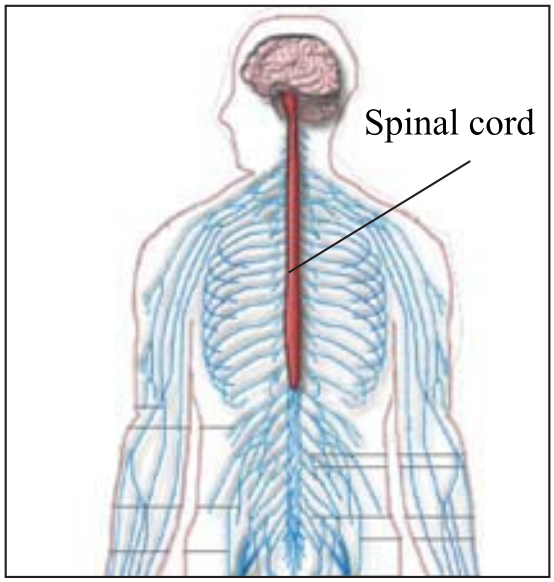
(3) Hind brain : It contains such vital centers as cardiac, respiratory and digestion like involuntary functions.

Brain also possesses centers for the activities like listening, smelling and testing.

Spinal cord :

Spinal cord is protected in vertebral column.

Spinal cord extends from the posterior end of brain and it is a cord like structure made up of many veins. It passes through vertebral canal of the vertebral column and reaches to the end of waist. It acts as the link between the brain and the nerves those stretch out throughout the body.



Blinking of an eye, when a particle of dust touches our eyelids. Taking away of one's hand while touching any hot thing. These are the examples of reflex action during which brain is not involved but spinal cord releases the impulse for that action.

Peripheral Nerve System [PNS] :

The peripheral nervous system constitutes the different nerves those arise from the brain and the spinal cord. These nerves are scattered over entire body.

There are types of nerves found in human body :

(1) Sensory Nerves

(2) Motor Nerves

(3) Mixed Nerves

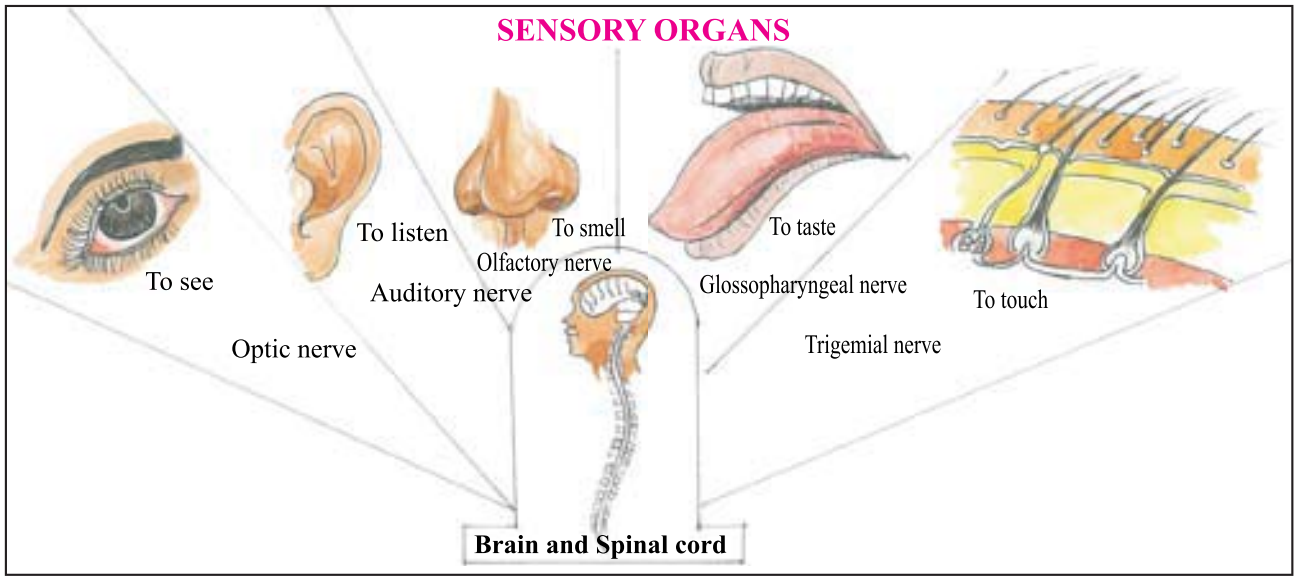
(1) Sensory Nerves : They carry the messages (impulse) from the different parts of the body to the brain.

(2) Motor nerves : They carry the messages (impulse) from brain to different organs of body.

(3) Mixed nerves : They carry the messages (impulse) in both the directions.

3. Sensory organs :

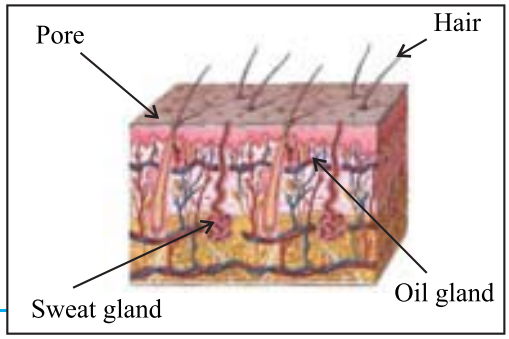
We feel the heat, cold, pain, taste, smell and also the presence or absence of light. These all are known as sense. We use different organs of our body to feel these type of external changes occurring in our surroundings. These type of organs are called sensory organs.



Skin :

→ Rub your both palm against each other and let it touch your chick.

- What do you feel ?



→ Keep an ice in your hand for some time.

- What do you feel ?

→ Our skin feels the different senses like cold, heat, pain, touch and pressure.

→ The skin is the outer envelop of our body.

→ It protects our body.

→ It possesses specialized cells to experience different senses like touch, pain, heat, cold and pressure.

→ These cells are connected with the nerves.

→ These nerves conduct the impulses to the brain.

Ask your friend to close his eyes. Now, touch your friend's hands-legs, forehead, head, back etc with your fingers. How many fingers touch your friend ? Ask this question to your friend. Does your friend can answer the questions correctly ?

- We can sense our tips of fingers better than other organs of our body.
- Have you seen blind men reading with the help of their finger tips.
- Skin contains an important plastid called melanin. A person looks white if he is having less proportion of melanin and a person looks dark if he having more proportion of melanin.

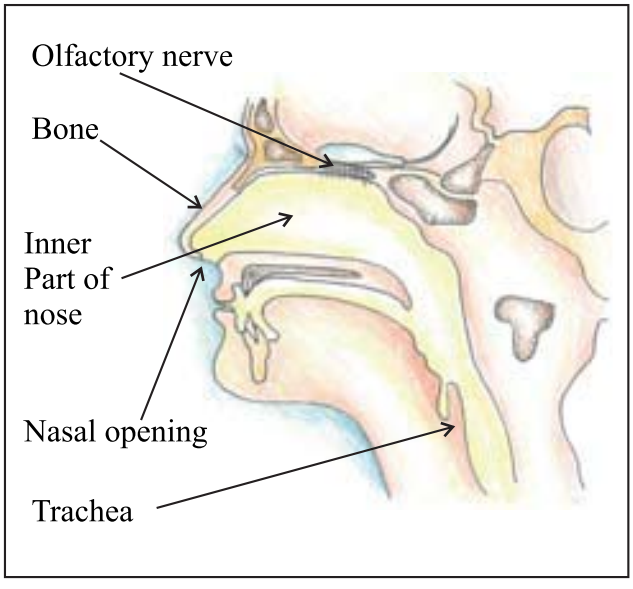
Nose :

What is required : Lemon, leaves of sweet neem, asafoeteda, garlic, cardamon, onion, tulsi, ajwain etc and other things having strong and distinct smell.

What will you do ?

→ Close your eyes.

→ Ask your friend to give any one



thing out of the above said things. Try to identify that thing by smelling it and avoid it to see or to taste. Identify all above said things one after another.

→ We recognize the smell of things with the help of our nose.

→ We also breathe with our nose.

→ Nose contains specialized cells to sense the smell. They are known as olfactory cells.

→ These olfactory cells carry olfactory impulse to brain through olfactory nerve.

→ The inner surface of nose remains covered by mucous.

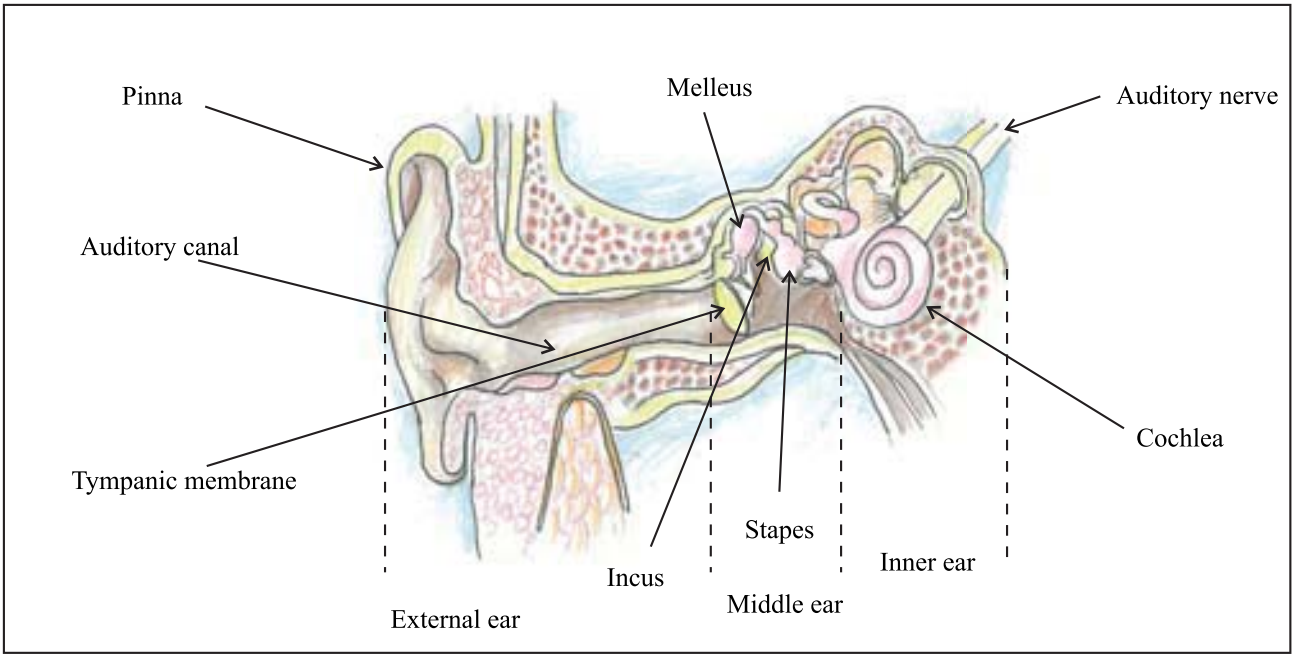
Some animals have more powerful olfactory sense than human beings

E.g. Snifer dog.

Ear :

In human the ear is made up of three parts :

(1) External ear (2) Middle ear (3) Internal ear



Functions :

→ The function of external ear is to collect the sound vibration from the atmosphere and carry them to the middle ear.

→ The tympanic membrane vibrates when sound waves strike it.

→ Three bones named malleus, incus and stapes also fill vibrations.

→ Due to that the perilymph (liquid present in internal ear) also vibrates. The impulse of this vibration reaches to brain with the help of auditory nerve. We can hear the sound at that time.

→ The perilymph is also useful to balance our body.

→ What will you do ?

→ Ask your friend to close his eyes.

→ Close any one of your ears with the help of your palm.

→ Move to a distant place in your classroom and clap.

→ Your friend about your exact position and repeat this activity.

● Is your friend is able to locate you exactly ? Note down your experience.

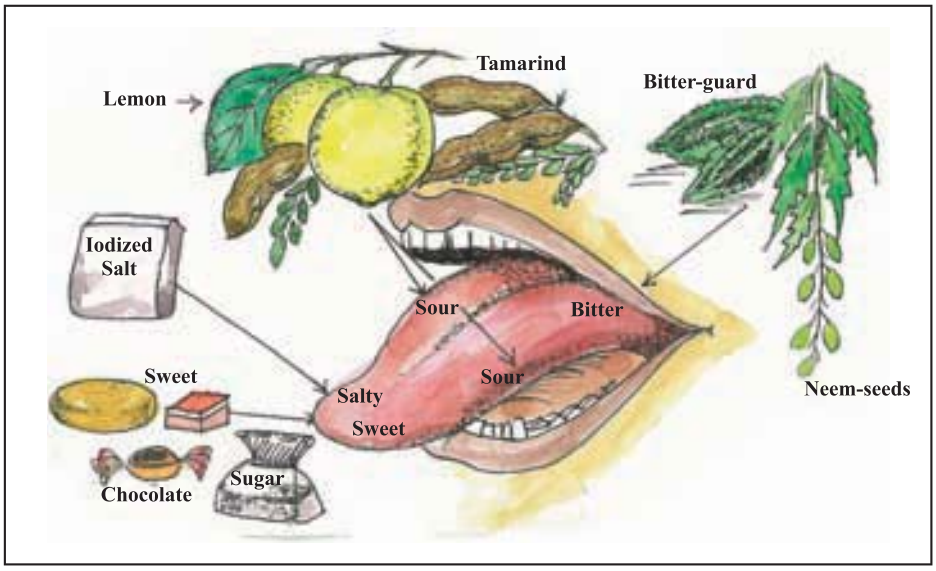
Tongue :

What is required ? Sugar, lemon, neem leaves

What to do ?

→ Ask your friend to close his eyes and nose.

→ Take some sugar.



→ Put it on the tongue of your friend, which taste does he/she feel ? Ask him.

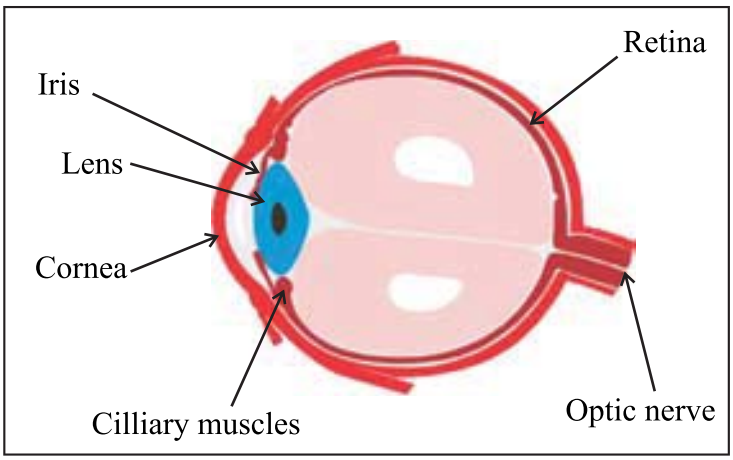
→ Then tell him to wash his mouth with water.

→ Try to experience everything one after another. Wash mouth after each activity.

→ Does your friend able to identify the perfect taste every time ?

Different regions of tongue can feel different type of taste. The tongue contains different taste buds to detect different taste. Taste buds contain specialized cells. These cells are connected to the IXth nerve and carry impulse of taste to the brain.

Eye :



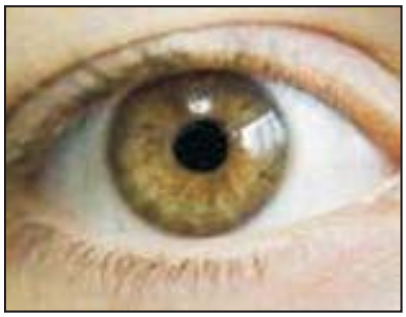
Organ	Location and description	Function
Corena	Outermost glass like transparent layer is known as cornea.	It allows the light rays to pass to through it.
Pupil	An aperture like structure situated behind the cornea is called pupil.	It focuses the light rays on the lens.
Iris	It is circular shelf like diaphragm. It may be blackish, dark brown blue, green, gray or yellow.	Iris works like a diaphragm of a photographic camera.
Lens	A structure made up of soft tissue and it is alike transparent magnifying glass, situated behind the pupil.	Lens focus the image of the object on retina.
Retina	This is a thin and innermost coat of eyeball. It comprises of many cells which are sensitive to the light.	An image of an object is focused on the cornea. The impulse of the light is collected by the cells of cornea and it is passed to the optic nerve. Optic nerve carry that impulse to the brain.

What to do ?

→ Stand in front of the sun beside your friend.

→ Observe the pupil of each other. Now. come back to your classroom and immediately observe the iris. What type of difference occurs in the area of the iris ? Note down that.

When do you observe following type of pupil ? Note down that ?



Note :

Note :

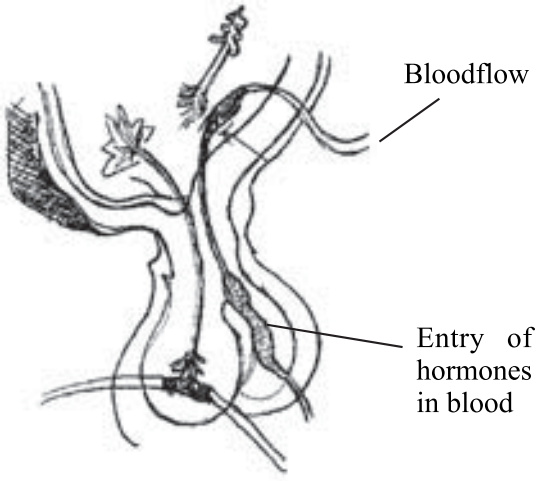
Endocrine system :

The effective regulation of the functions of the body require not only the constant modulation and integration by the nervous system but also by the endocrine system.

You may have experienced the feelings of happiness and sadness. You may have found unusual weight of some people (very high or very low). All human being show variations in their voice, development of mustache and beard, development of organs. Hormones are responsible for that.

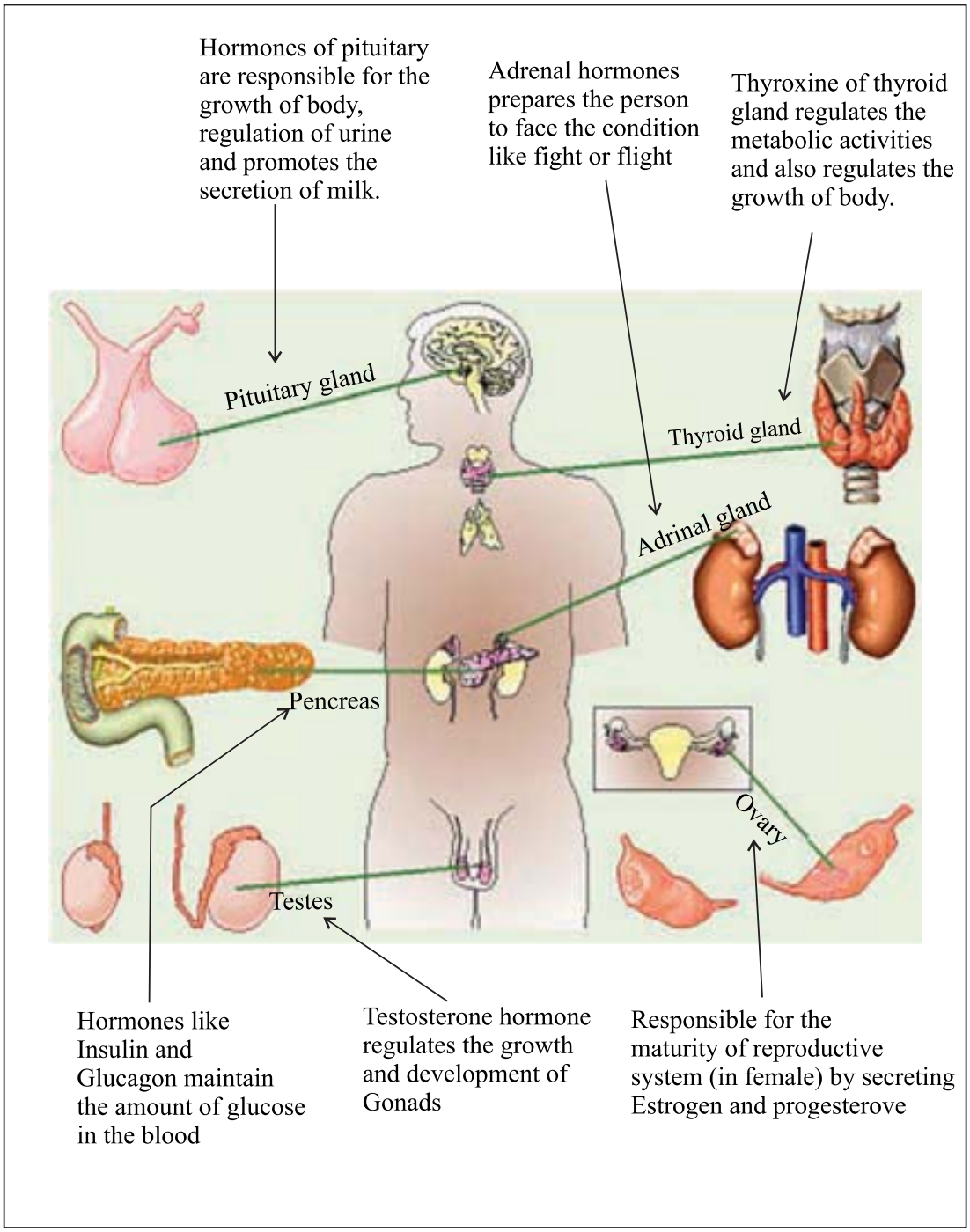
Hormones are secreted in a very small quantity in our body. But they have a big dominance over different organ systems.

- → They are chemicals those carry the messages.
- → Hormones are synthesized in endocrine glands.
- → Hormones reach to different organs with the help of blood.
- → Effect of different hormones are Different.



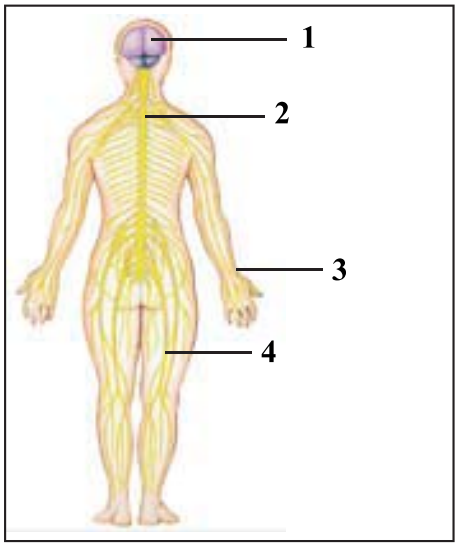
Conduction of hormones in blood

Where do the endocrine glands situated in our body ? Observe the following diagram and fill in the blanks in the table given on the next page.



Sr. No.	Name of Endocrine Gland	Location of the gland	Hormones secreted by the gland	Functions
1				
2				
3				
4				
5				
6				

Q.1 Label the following diagram of human nervous system and write down their functions :



Functions :

1. _____

2. _____

3. _____

4. _____

_____

_____

Q. 2 Answer following questions :

1. Which types of nervous system are found in our body ?
2. Which organs are included in central nervous system ?
3. What is an endocrine gland ?
4. Give names of human endocrine glands.

Q. 3 Fill in the blanks in the following table :

Sr. No.	Name of an organ	Connecting nerve	Function
1	Skin		
2	Nose		
3	Ear		
4	Tongue		
5	Eye		

Q. 4 Which sensory organ can sense the following impulse ?

1. Climate becomes cool at the time of raining.
2. Jigisha has sprayed scent on her clothes.
3. Slush is sour
4. Het is singing a sweet song.
5. Photograph of the Himalaya are very beautiful.

Do it yourself :

Close your eyes and ask your friend to give you a thing which can not harm you by its touch, smell or taste. Try to identify that thing by touching, smelling or tasting it.