

## Lesson 11. Transportation in Animals and Plants

Grade VI I

### TRANSPORT OF SUBSTANCES

#### In Plants

##### Transport of Water and Minerals

- Plants absorb water and minerals by roots through root hair. Which increase the surface area of the root for absorption of water and mineral nutrients dissolved in water.
- Plants have pipe-like vessels to transport water and nutrients from the soil (vascular tissue).
- Water and nutrients in the plant are transported by xylem.
- Xylem forms a continuous network of channels that connects roots to the leaves through the stem and branches.
- Food is transported to all parts of the plant by phloem.

##### Excretion of waste

- Water is lost by plants in the form of vapour through stomata by transpiration.
- Some wastes of photosynthesis are stored in leaves and barks of trees which are periodically shed. Gaseous wastes of respiration and photosynthesis are released into the air by stomata.

##### Blood

- Blood is the fluid which flows in blood vessels.
- It transports substances like digested food from the small intestine to the other parts of the body.
- It carries oxygen from the lungs to the cells of the body.
- It also transports waste for removal from body.

##### Components of Blood

- Plasma:** Fluid part of the blood.
- Red Blood Cells (RBC):** Contain a red pigment called hemoglobin, which binds with oxygen and transports it to all the cells.
- White Blood Cells (WBC) :** Fight against germs that may enter body.
- Platelets:** Help in blood clotting.

#### In Animals

##### Circulatory system

##### Blood Vessels

- There are two types of blood vessels;
- Arteries :** carry oxygen – rich blood from the heart to all parts of the body have thick elastic walls.
  - Veins :** carry carbon dioxide-rich blood from all parts of the body back to the heart; have thin walls.

##### Excretory system

- Done by the blood capillaries in the kidneys,
- Blood reaches the two kidneys, where wastes dissolved in water are removed as urine.
- Urine goes into the urinary bladder through tube – like ureters.
- It is stored in the bladder and is passed out through the urinary opening at the end of a muscular tube called urethra.

##### Heart

- Beats continuously and acts as a pump for transport of blood.
- Located in the chest cavity with lower tip slightly tilted towards the left.
- It has four chambers; two upper chambers are called the atria and two lower chambers are called the ventricles.
- It has a partition between the chambers to avoid mixing up of blood rich in carbon dioxide.

##### Heartbeat

- Rhythmic contraction followed by relaxation of heart muscles constitutes a heartbeat.
- Each heartbeat generates one pulse in the arteries and the pulse rate per minute indicates the rate of heartbeat.

## Know the Terms

- **Arteries** : Arteries carry oxygen-rich blood from the heart to all parts of the body.
- **Blood** : Blood is the fluid which flows in blood vessels.
- **Excretion and excretory system**: The process of removal of wastes produced in the cells of the living organisms.
- **Heart** : The heart is an organ which beats continuously to act as a pump for the transport of blood.
- **Haemoglobin** : One type of cells are the red blood cells (RBC) which contain red pigment called haemoglobin.
- **Plasma** : The fluid part of the blood is called plasma.
- **Platelets** : The clot is formed because of the presence of another type of cells in the blood, called platelets.
- **Veins** : Veins are the vessels which carry carbon dioxide-rich blood from all parts of the body back to the heart.
- **White Blood Cells** : The blood also has white blood cells (WBC) which fight against germs that may enter our body.
- **Xylem** : The vascular tissue for the transport of water and nutrients in the plant is called the xylem.

## Objective Type Questions

(1 Mark each)

### I. Multiple choice questions

1. The colour of blood is red due to the presence of
  - a. Chlorophyll
  - b. Haemoglobin
  - c. Oxygen
  - d. Carbon dioxide
2. Transport of food in plants takes place through.
  - a. Xylem
  - b. Phloem
  - c. Lenticels
  - d. Bark
3. The excretory substance in fishes is
  - a. Urea
  - b. Ammonia
  - c. Uric acid
  - d. None of these
4. Which controls blood circulation?
  - a. Lungs
  - b. Kidney
  - c. Heart
  - d. Liver



5. Function of WBCs is / an :

- a. Transport of  $O_2$
- b. Fight against germ
- c. Help in clotting of blood
- d. None of these

6. Removal of metabolic waste from body is termed as:

- a. Ingestion
- b. Egestion
- c. Excretion
- d. Elimination

7. Blood platelets help in

- a. Clotting of blood
- b. Killing germs
- c. Transport of  $CO_2$
- d. Transport of  $O_2$

8. Urine consists of

- a. 95% water and 5 urea
- b. 95% water, 2.5% urea and 2.5 other wastes
- c. 95% water and 2.5 urea
- d. 50% water, urea, 25% other wastes

9. The muscular tube through which stored urine is passed out of the body is called

[NCERT Exemplar]

- a. Kidney
- b. Ureter
- c. Urethra
- d. Urinary bladder

10. They are pipe-like, consisting of a group of specialised cells. They transport substances and from a two-way traffic in plants. Which of the following terms qualify for the features mentioned above?

[NCERT Exemplar]

- a. Xylem tissue
- b. Vascular tissue
- c. Root hairs
- d. Phloem tissue

11. The absorption of nutrients and exchange of respiratory gases between blood and tissues takes place in.

[NCERT Exemplar]

- a. Veins
- b. Arteries
- c. Heart
- c. Capillaries

12. In which of the following parts of human body are sweat glands absent ?

- a. Scalp
- b. Armpits
- c. Lips
- d. Palms

13. In a tall tree, which force is responsible for pulling water and minerals from the soil?

[NCERT Exemplar]

- a. Gravitational force
- b. Transportation force
- c. suction force
- d. Conduction force

1. b	2. b	3. b	4. c	5. b	6. c	7. a
8. b	9. c	10.d	11. d	12. c	13. c	



### I. Fill in the blanks

1. Blood is a \_\_\_\_\_ which flows in the \_\_\_\_\_.

2. Veins carry the blood rich in \_\_\_\_\_.

1. Fluid, blood vessels

2. Carbon dioxide

### II. Fill in the blanks

Fill in the blanks of the following paragraph using just two word-arteries and veins.

\_\_\_\_\_ a \_\_\_\_\_ carry oxygen-rich blood from the heart to all parts of the body  
 \_\_\_\_\_ b \_\_\_\_\_ carry carbon dioxide-rich blood from all parts of the body back to the heart.  
 \_\_\_\_\_ c \_\_\_\_\_ have thin walls and \_\_\_\_\_ d \_\_\_\_\_ have thick elastic walls. Blood flows at high  
 rich pressure in \_\_\_\_\_ e \_\_\_\_\_. Valves are present in \_\_\_\_\_ f \_\_\_\_\_ which allow blood to flow only  
 towards the heart. \_\_\_\_\_ g \_\_\_\_\_ divide into smaller vessels. These vessels further divide into  
 extremely thin tubes called capillaries. The capillaries join up to form \_\_\_\_\_ h \_\_\_\_\_.

[NCERT Exemplar]

a. arteries	b. veins	c. veins	d. arteries
e. arteries	f. veins	g. arteries	h. veins

### II. 1. Fill in the blanks.

1. Blood flows in arteries is rich in \_\_\_\_\_.

2. The phloem helps in the transportation of \_\_\_\_\_ from leaves to various parts of plant.

3. \_\_\_\_\_ fight against germs.

1. oxygen

2. food

3. White blood cells (WBCs)

Next Generation School

### I. Match the following

Column A	Column B
i. Vein	a. fight against germs
ii. Root	b. birds, snakes, lizards
iii. WBCs	c. human
iv. Uric acid	d. carbon dioxide rich blood
v. Urea	e. absorb water

i. d	ii. e	iii. a	iv. b	v. c
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### II. Match the following

Column A	Column B
a. Right ventricle	i. Pushes blood into the pulmonary artery.
b. Pulmonary veins	ii. Take deoxygenated blood from the heart to lungs.
c. Left atrium	iii. Receives blood from different parts of the body
d. Pulmonary arteries	iv. Bring oxygenated blood from lungs to the heart.
e. Left ventricle	v. Pushes blood into the aorta.
f. Right auricle	vi. Receives deoxygenated blood from the pulmonary veins.

a. i	b. iv	c. vi	d. ii	e. v	f. iii
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### I. True or False

1. Blood appears red due to the presence of haemoglobin.
2. There are valves present in arteries.
3. Heart acts as pump for the transport of blood.
4. When blood reaches the two kidneys, it contains only harmful substances.
5. Heart has two chambers – an atrium and a ventricle.

1. True	2. False	3. True	4. False	5. False
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## Quiz Time

1. Name the organ system which carries the blood from heart to different parts of body and brings it back to the heart in human.
2. What is blood?
3. What are three types of cells in the blood?
4. Name the device which is used to hear the heartbeats clearly.
5. What are vascular tissues in plants?
6. What is blood plasma?
7. Name the pigment which makes the colour of blood red.
8. Which cells prevent the loss of blood from a cut or injured tissue?
9. How many chambers are there in human heart?
10. Name three types of blood vessels.

1. Circulatory System
2. Blood is a fluid connective tissue.
3. RBCs, WBCs and platelets
4. Stethoscope
5. i. Xylem ii. Phloem
6. The liquid part of the blood is called plasma.
7. Haemoglobin
8. Platelets
9. Four chambers
10. i. Artery ii. Veins iii. Capillaries

## N CERT Corner

## Intext Questions

- 1. Do you see the heart and the blood vessels ?**

No, we have seen these only in the picture.

- 2. Why is the colour of blood red ?**

Because blood has a red pigment known as haemoglobin.



**3. Can you feel some throbbing movements ?**

Yes.

**4. Why do you think there; is throbbing ?**

Because blood vessel in there.

**5. Find other places in your body where you can feel the pulse.**

Neck, between biceps and triceps, behind knee, forehead (temple), thigh.

**6. Compare the values you obtained and insert them in Table 11.1.**

Table 11.1 Pulse rate

S.No	Name	Pulse per minute
1	Rekha	70
2	Raman	71
3	Priya	70
4	Madhu	70
5	Kusum	72

**7. What will happen if the blood rich in oxygen and the blood rich in carbon dioxide mix with each other ?**

The net oxygen content of blood will fall and hence body will suffer from oxygen deficiency.

**8. Paheli wonders which side of the heart will have oxygen-rich blood and which side will have carbon dioxide-rich blood.**

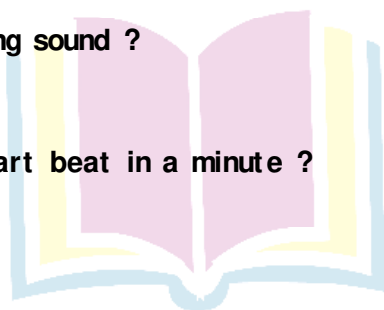
Right side of heart possesses blood rich in oxygen and left side of heart has blood rich in carbon dioxide.

**9. Do you hear a regular thumping sound ?**

Yes.

**10. How many times did your heart beat in a minute ?**

70 times.



Next Generation School



11. Record your own pulse rate and heartbeat and that of your friends while resting and after running and record in Table 11.2.

Table 11.2 Pulse rate and Heart beat

Name of the student	While resting		After running (4- 5 minutes)	
	Heart beat	Pulse	Heart Beat	Pulse rate
Rekha	70	70	90	90
Raman	71	71	95	95
Priya	70	70	89	89
Madhu	70	70	100	100
Kusum	72	72	110	110
Alka	70	70	96	96

12. Do you find any relationship between your heart beat and pulse rate ?

Yes. Both are the same.

13. Boojho wonders if sponges and hydra also have blood ?

No

14. Does sweat serve any other function ?

Sweating keeps us cool and sustains body temperature.

15. Paheli wants to know whether other animals also urinate ?

Yes.

16. Boojho wants to know why plants absorb a large quantity of water from the soil, then give it off by transpiration ?

Because transpiration helps in suction of water.

### Intext Questions

1. Match structures given in Column I with functions given in column II.

(i) Stomata	(a) Absorption of water
(ii) Xylem	(b) Transpiration
(iii) Root hairs	(c) Transport of food
(iv) Phloem	(d) Transport of water
	(e) Synthesis of carbohydrates

i. b	ii. d	iii. a	iv. c
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## 2. Fill in the blanks :

- (i) The blood from the heart is transported to all parts of the body by the \_\_\_\_\_.
- (ii) Haemoglobin is present in \_\_\_\_\_ cells.
- (iii) Arteries and veins are joined by a network of \_\_\_\_\_.
- (iv) The rhythmic expansion and contraction of the heart is called \_\_\_\_\_.
- (v) The main excretory product in human beings is \_\_\_\_\_.
- (vi) Sweat contains water and \_\_\_\_\_.
- (vii) Kidneys eliminate the waste materials in the liquid form called \_\_\_\_\_.
- (viii) Water reaches great heights in the trees because of suction pull caused by \_\_\_\_\_.

(i) arteries	(ii) red blood	(iii) capillaries	(iv) heart beat
(v) urea	(vi) salts	(vii) urine	(viii) transpiration

## 3. Choose the correct options :

- (a) In plants, water is transported through
- (i) Xylem (ii) Phloem
- (iii) Stomata (iv) Root hair
- (b) Water absorption through roots can be increased by keeping the plants :
- (i) in the shade (ii) in dim light
- (iii) under the fan (iv) covered with a polythene bag

(a) (i) xylem	(b) (ii) in dim light.
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## 4. Why is transport of materials necessary in a plant or in an animal ? Explain.

Different parts of the body perform different functions. For example, in plants, roots absorb water and leaves synthesize food by using water. The food is also required by root. So, there is no utility of water absorbed by roots if it does not reach leaf or food prepared by leaf when it does not reach root. So a transport system is necessary.

## 5. What will happen if there are no platelets in the blood ?

Blood cannot clot without the platelets. So, if there is any cut, blood will flow out ceaselessly causing the person to die.

## 6. What are stomata ? Give two functions of stomata.

Small pores in leaves of plants are known as stomata.

Functions of stomata :

- (i) Absorption of oxygen from air. (ii) Eliminating excess water by transpiration

**7. Does transpiration serve any useful function in the plants ? Explain.**

Due to transpiration, a suction pressure develops which is an aid to the transpiration of water.

**8. What are the components of blood ?**

Red blood cells, white blood cells, platelets and plasma.

**9. Why is blood needed by all the parts of a body ?**

Blood conveys digested food and oxygen to all parts of body. It also carries away the waste products.

**10. What makes the blood look red ?**

The presence of haemoglobin.

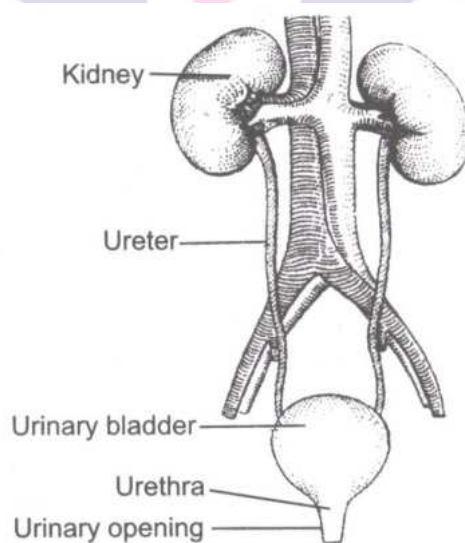
**11. Describe the function of the heart.**

Heart collects and distributes blood from and to different parts of the body.

**12. Why is it necessary to excrete waste products ?**

Waste products are injurious to the body.

**13. Draw a diagram of the human excretory system and label the various parts.**



**I. Very Short Answer Type Questions.**

**1. What happens when you get a cut on your body?**

The blood flows out and a clot forms after some time.

**2. What is blood?**

Blood is a fluid which flows in blood vessels.



### **3. What is plasma?**

The fluid part of the blood is called plasma,

### **4. Write the name of various kinds of found in the blood.**

There are three kinds of cells in blood:

- (i) Red blood cells      (ii) White blood cells      (iii) Platelets

### **5. Name the pigment due to which the colour of blood becomes red.**

Haemoglobin

### **6. What is the function of haemoglobin?**

Haemoglobin helps in the circulation of oxygen to the various parts of body.

### **7. What is the main function of white blood cells?**

White blood cells fight against germs to protect our body from diseases.

### **8. What is the function of platelets?**

The platelets help to form a clot on the cut part of the body to prevent loss of blood.

### **9. Write the various types of blood vessels.**

There are three kinds of blood vessels:

- (i) Arteries      (ii) Veins      (iii) Capillaries

### **10. What is pulse?**

The throbbing of heart due to the flow of blood in the arteries is called pulse.

### **11. What is pulse rate?**

The number of heart beats per minute is called pulse rate.

### **12. What is the pulse rate of a normal person.?**

A resting person usually has a pulse rate between 72 and 80 beats per minute.

### **13. What are veins?**

Veins are the vessels, which carry carbon dioxide rich blood from all parts of body to the

### **14. What are arteries?**

The vessels which carry oxygen rich blood from heart to various parts of body are called arteries.

### **15. Define capillaries.**

The arteries and veins are further divided into thin tubes which are called capillaries.

### **16. Where is our heart located?**

Heart is located in the chest cavity with its lower tip slightly tilted towards the left.



**17. How, many chambers are there in human heart?**

There are four chambers in human heart.

**18. Name the four chambers of heart :**

- (i) Right atrium
- (ii) Left atrium
- (iii) Right ventricle
- (iv) Left ventricle

**19. Write one important function of blood.**

The main function of blood is to transport oxygen.

**20 What is the size of our heart?**

Our heart's size is roughly the size of our fist.

**21. What is stethoscope?**

The device which is used to amplify the sound of the heart is called excretion.

**22. Define the term excretion.**

The process of removal of wastes produced in the cells of the living organisms is called excretion.

**23. What is excretory system?**

The system which is involved excretion of nitrogenous wastes from body is called excretory system.

**24. Name the main excretory organ.**

Kidneys are the main excretory organ.

**25. What is urine?**

The mixture of various wastes with water is called urine.

**26. What is the composition of urine?**

Urine consists of 95% water, 2.5% urea and 2.5% other wastes.

**27. What is sweat?**

The mixture of our body from excretory system?

**28. Which part of our body from excretory system?**

Kidneys, ureter, bladder and urethra form excretory system.

**29. What is tissue?**

The group of cells that perform specialised function in an organism is called tissue.

**30. What is vascular tissue?**

Plants have pipe like cells to transport water, nutrients and food which are called vascular tissue.



**31. Write two types of vascular tissues.**

i. Xylem

ii. Phloem

**32. What is xylem?**

The vascular tissue for transport of water nutrients in the plants is called xylem.

**33. What is phloem?**

The vascular tissue which is used to transport food to all parts of the plants is called phloem.

**34. What is transpiration?**

The process by which excess water evaporates through stomata from the leaves is called transpiration.

**35. Circulatory system is common in all multi-cellular organism. Name two such organism which have no circulatory system.**

Hydra and Sponge.

**36. Write the name of an artery which transports deoxygenated blood.**

Pulmonary artery.

**37. Name a vein which carry oxygenated blood.**

Pulmonary vein.

**38. Why are the walls of arteries thicker than that of veins?**

The blood flows in the arteries with higher pressure, so their walls are thicker.

**39. Name the pumping part in our blood which pumps the blood.**

Heart .

**40. Name the upper part of the heart?**

Atria

**41. Name the lower part of the heart.**

Ventricles.

**42. What is the composition of urine?**

The urine consists of 95% water, 2.5% urea and 2.5% other wastes.

## **II. Very Short Answer Type Questions.**

**1. Name the term used for removal of undigested food from our body.**

Excretion.



2. Name the structure which increases the surface area of the root for the absorbing of water.

Root hair.

3. What is the function of vascular tissue in plants?

Upward conduction of water and mineral by xylem and the downward conduction of food by phloem.

4. Expand ECG.

Electrocardio Graph.

5. What is meant by excretion?

Excretion refers to the removal of metabolic waste from body cells.

6. What happens to useful substance which are filtered along with harmful substances in kidneys?

They are reabsorbed by blood flowing around kidney tubule.

7. What is the composition of sweat?

Sweat contains water, salt and urea.

8. What is the pulse rate of a normal person?

Between 72 and 80 beats per min.

9. Veins have valves which allow blood to flow only in one direction. Arteries do not have valves. Yet the blood flows in one direction only. Can you explain why?

[NCERT Exemplar]

Blood flow in arteries is rapid and at a high pressure. also arteries have thick elastic walls.

10. What is the special feature present in a human heart which does not allow mixing of blood when oxygen- rich and carbon dioxide- rich blood reach the heart?

[NCERT Exemplar]

Heart is partitioned into four chambers.

11. Name the organ which is located in the chest cavity with its lower tip slightly tilted towards the left.

[NCERT Exemplar]

Heart.



### III. Very Short Answer Type Questions.

**1. Why is it necessary to excrete waste products?**

All cells of our body produce waste products, which are toxic to the body and therefore need to be excreted out.

**2. What is the relationship between the rate of heartbeat and pulse rate?**

Pulse rate is equal to the number of heartbeats per minute.

**3. Who discovered blood groups in humans?**

Karl Landsteiner discovered blood groups in humans.

**4. How is urine examination useful to the doctor?**

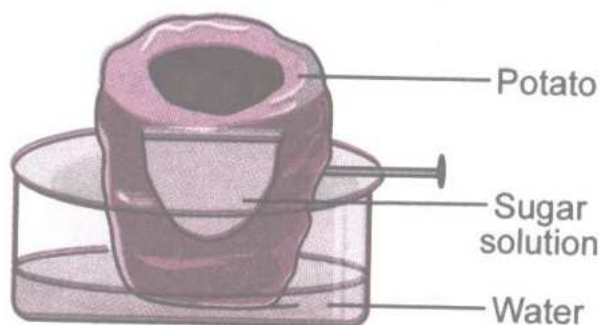
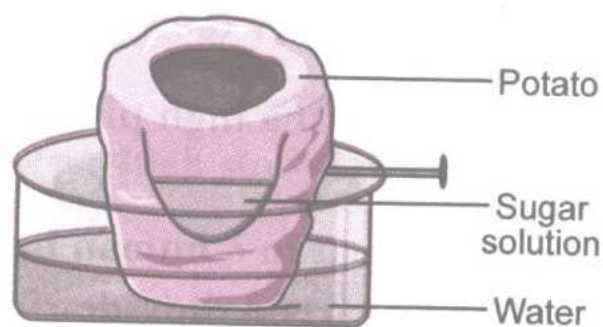
Urine examination determines whether the kidney is working properly or not.

**5. What makes the blood look red?**

The presence of haemoglobin, a red pigment in the red blood cells (RBCs) makes blood appear red in colour.

### I. Short Answer Type Questions.

**1. Look at figure. Draw another figure of the same set-up as would be observed after a few hours.** [NCERT Exemplar]





2. Paheli uprooted a rose plant from the soil. Most of the root tips, with root hairs were left behind in the soil. She planted it in a pot with new soil and watered it regularly. Will the plant grow or die? Give reason for your answer.

Possible answers are.

- Without the root hairs the roots will not be able to absorb water and nutrients and the plant will die.
- The stem of the rose plant may grow new roots and the plant will live.
- The rose plant may not be able to survive in a different type of soil.

3. (a) Name the only artery that carries carbon dioxide-rich blood.

(b) Why is it called an artery if it does not carry oxygen-rich blood?

[NCERT Exemplar]

a. Pulmonary artery

b. It is so because arteries carry blood away from the heart.

4. Boojho's uncle was hospitalised and put on dialysis after a severe infection in both of his kidneys.

a. What is dialysis?

b. When does it become necessary to take such a treatment?

a. In dialysis, blood is filtered periodically through an artificial kidney.

b. In the event of kidney failure.

5. Name the process and the organ which helps in removing the following wastes from the body.

[NCERT Exemplar]

a. Carbon dioxide

b. Undigested food

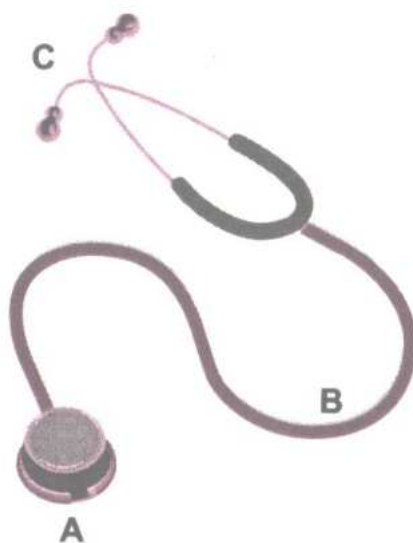
c. Urine

d. Sweat

Process	Organ
a. Exhalation	Lungs
b. Egestion	Large intestines and anus
c. Excretion	Kidneys
d. Perspiration (sweating)	Sweat glands



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



a. Name the instrument

b. label the part A, B and C.

a. The given instrument is stethoscope.

b. A-Diaphragm

B-Tube

C-Ear pieces

7. Paheli noticed water being pulled up by a motor-pump to an overhead tank of a five-storeyed building. She wondered how water moves up to great heights in the tall tree standing next to the building. Can you tell why? [NCERT Exemplar]

Water constantly evaporates from the leaves of the trees to form water vapour. This process is known as transpiration. This loss of water generates a “suction pull” which draws water up the tall trees.

8. Why is transport of materials necessary in a plant or in an animal? Explain. [NCERT]

Transport of materials is necessary for regular supply of nutrients and oxygen by every cell in both plants and animals. The food is transported to every cell for absorption. Oxygen and carbon dioxide are transported to and from all the cells. A system for constant removal of waste materials is required. For the transport of all these materials (food, gases, and wastes), plants and animals need a complex transport system.

9. What will happen if there are no platelets in the blood? [NCERT]

A blood clot is formed because of platelets. They release blood clotting chemicals at the site of injury. These chemicals form a clot and prevent further bleeding. If there are no platelets in the blood, then the blood would not be able to clot.



**10. What are stomata? Give two functions of stomata.**

**[NCERT]**

Stomata are tiny pores present on the surface of a leaf. Functions of stomata

- Stomata help in the exchange of gases
- Evaporation of water from the leaf surface occurs through stomata.

**11. Does transpiration serve any useful function in the plants? Explain.**

**[NCERT]**

Transpiration is the evaporation of water from the plants. The water evaporates through the stomata present on the surface of the leaves. Transpiration is mainly responsible for the loss of water that was absorbed by the plants. However, it is important for plants as it helps in the movement of water to the top of tall trees. As a result, it helps in the distribution of water throughout the plant body. It also helps in cooling the plant.

**12. What are the components of blood?**

Blood contains a fluid part called plasma and a cellular part comprising of red blood cells, white blood cell and platelets. Plasma contains water, salts and gases.

**13. Why is blood needed by all the parts of a body?**

Blood is needed by all parts of the body for transport of materials in the body. It performs the following important functions.

- It transports  $O_2$  from the lungs to all the body cells.
- It carries  $CO_2$  a waste product back to the lungs so that it can be exhaled easily.
- It transmits heat, thus regulating the body temperature.
- It also fights off diseases and infections.

**14. List the function of the blood.**

The following are the functions of the blood.

- It transports oxygen from the lungs to the body cells and carbon dioxide from the cells to the lungs.
- Blood carries in its plasma absorbed food, minerals, salt and vitamins from the small intestine to the liver for processing. These materials are then transported to the heart for distribution to all parts of the body.
- It transports liquid waste from the body cells to the kidneys for removal from the body.

**15. Give reasons for the following statements.**

- Ventricles have thicker walls than auricles.
- Valves are present at the opening of auricles into ventricles.



c. The walls of arteries are thick.

a. this is because ventricles pump blood to lungs and to different body parts for which they need strength.

b. Valves are present at the opening of auricles into ventricles to prevent backflow of blood.

c. The walls of arteries are thick because they carry blood at high pressure.

#### 16. What is the function of the circulatory system in humans?

The functions of circulatory system is to transport oxygen, carbon dioxide, hormones and excretory wastes from one region to another.

#### 17. How are oxygen and food circulated in Hydra?

Hydra does not have specialised organs for circulation. Oxygen and food are diffused into the body and undigested material is diffused out.

### II. Short Answer Type Questions.

#### 1. Write the differences between arteries and veins.

Arteries	Veins
1. Their walls are thick and elastic	1. Their walls are thin.
2. They have no valves	2. They have valves.
3. Blood flows with high	3. Blood flows at low pressure.
4. They carry oxygen rich blood from heart to the body parts.	4. They carry carbon dioxide rich blood from the body parts to the heart.

#### 2. Complete the following table by conducting a test survey in your class:

Table 11.1: Pulse rate

S.No	Name of the student	Pulse per minutes
1		
2		
3		
4		
5		

S.No	Name of the student	Pulse per minutes
1	Rakesh	75
2	Mohan	72
3	Sohan	76
4	Sonu	72
5	Monu	75

### 3. Explain the structure and use of the stethoscope.

Doctor uses the stethoscope as a device to amplify the sound of the heart. It consists of a chest piece that carries a sensitive diaphragm, two ear pieces and a tube joining the parts. Doctors can get clues about the condition of our heart by listening through a stethoscope.

### 4. How does the heart avoid the mixing of oxygen rich blood and carbon dioxide rich blood?

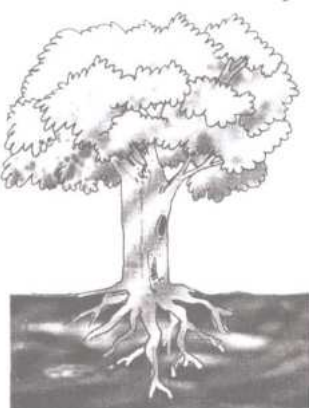
The heart has four chambers. The two upper chambers are called atria and the two lower chambers are called the ventricles. The partition between the chambers helps to avoid mixing up of the blood rich in oxygen with the blood rich in carbon dioxide.

### 5. What is heartbeat? Write its importance.

The muscles in the walls of the chambers of heart contract and relax rhythmically. This rhythmic contraction and relaxation constitute a heartbeat which goes on throughout life. The rhythmic beating of various chambers of heart maintains circulation of blood to transport oxygen and other substances to the different parts of the body.

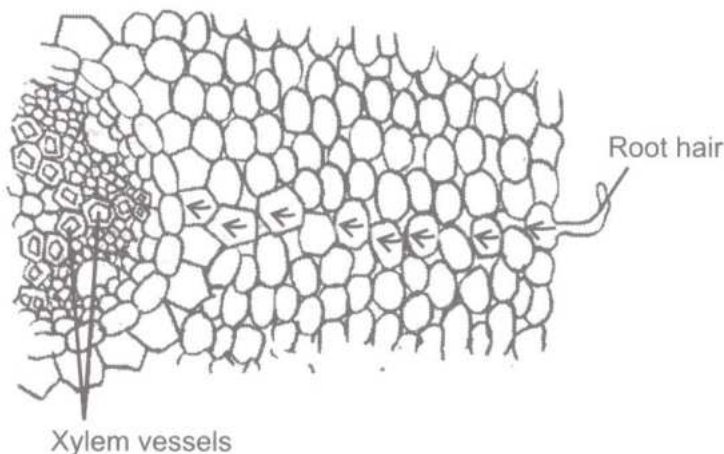
### 6. How are the water and minerals transported in the plants?

The vascular tissue for the transportation of water and nutrients in the plant is called the xylem. The xylem forms a continuous network of channels that connects roots to the leaves through the stem and branches and thus transports water and nutrients to the entire plant.



## 7. How does absorption of water and nutrients take place in the roots?

Plants absorb water and minerals by the roots. The roots have root hair. The root hair increase the surface area of the root for the absorption of water and minerals dissolved in water. The root hair is in contact with the water present between the soil particles.



## 8. Define the term transpiration. Write its importance.

The process of removal of excess water in the form of water vapour through the stomata present on the lower surface of leaves is called transpiration. The evaporation of water from leaves generates a suction pull which can pull water to great heights in the tall trees. Transpiration also lowers the temperature of the plants.

## 9. Explain the excretion in fishes, birds, lizards and snakes.

The way of removal of waste products from the body of animals depends on availability of water. Aquatic animals like fishes excrete cell waste (ammonia) in gaseous form which directly dissolves into water. Some land animals like birds, lizards, snakes excrete a semi-solid white coloured compound called uric acid.

## 10. What is dialysis?

Sometimes a person's kidneys may stop working due to infection or injury. As a result of kidney failure, waste products start accumulating in the blood. Such persons cannot survive unless their blood is filtered periodically through an artificial kidney. The process of removal of waste using artificial kidneys is called dialysis.

## 11. What happens when kidneys fail to work?

There are various types of wastes formed in the body. They are harmful, so it is necessary to remove them from the body. Kidneys are the organ which filter nitrogenous wastes. In case these organs (kidneys) fail to work, urea will not be excreted from the body. As urea is highly toxic the life of such person will be in danger.



## 12. Explain the importance of blood capillaries.

Capillaries are the vessels having very thin wall. The exchange of material between blood and tissue take place through the wall of the capillaries. The material diffuse from blood into the tissues and the waste materials enter into the capillaries along with the carbon dioxide. The capillaries join to form veins which bring back the blood to heart.

### III. Short Answer Type Questions- I

#### 1. In our heart, there is no mixing of oxygenated and deoxygenated blood. How it is made possible?

In our heart, the right side and left side is completely separated by a septum. the septum does not allows oxygenated and deoxygenated blood to mix.

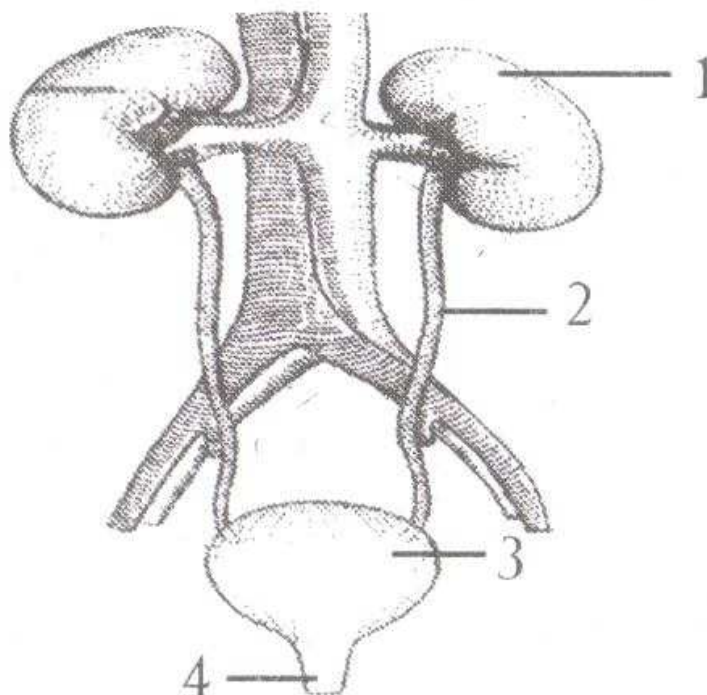
#### 2. What is the function of valves in veins?

Valves in veins maintains flow of blood only in one direction i.e., from body organs to heart.

#### 3. Where can you feel the pulse?

Pulse can be felt by placing finger tips of right hand on the artery that passes below the skin on the side of the side of the thumb.

#### 4. Human excretory system is depicted in the figure.





a. Part 1 : Kidney

Part 2 : Ureter

Part 3 : Urinary Bladder

Part 4 : Urethra

b. function of 1 (kidney) : Helps in filtration of blood  
function of 3 (Urinary Bladder) : receives and collects urine from kidneys.

**5. Boojho's uncle was hospitalised and put on dialysis after a severe infection in both of his kidneys.**

**(a) What is dialysis ?**

**(b) When does it become necessary to take such a treatment ? [NCERT Exemplar]**

(a) In dialysis blood is filtered periodically through an artificial kidney.

(b) In the event of kidney failure.

**6. (a) Name the only artery that carries carbon dioxide-rich blood. (**

**b) Why is it called an artery if it does not carry oxygen-rich blood ? [NCERT Exemplar]**

(a) Pulmonary artery

(b) It is so because arteries carry blood away from the heart.

### III. Short Answer Type Questions-II

**1. Name the three types of blood cells and give their functions.**

The three types of blood cells present in blood are :

(i) RBC (Red Blood Cells) - They contain a pigment haemoglobin which binds with oxygen and helps in the transport of oxygen.

(ii) WBC (White Blood Cells) - They help body to fight against germs. Hence, also called soldiers of body.

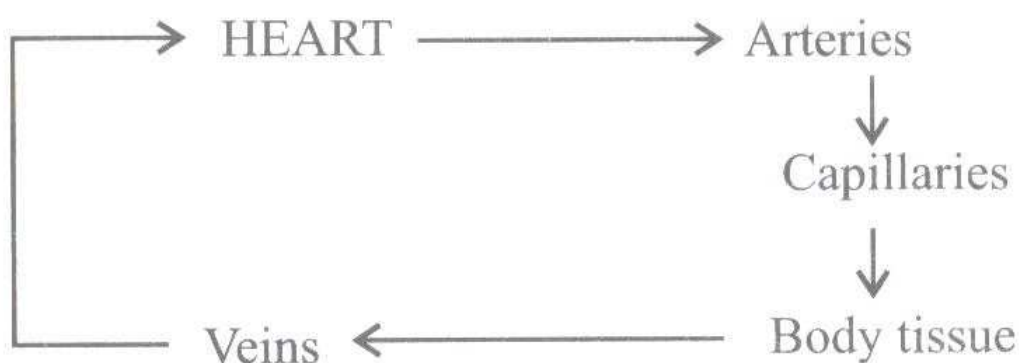
(iii) Platelets—They help in clotting of blood.

**2. Describe in brief, how water is absorbed and transported in a tall tree.**

Plants absorb water and minerals by the roots. The roots have root hair. These are in contact with the water present between the soil particles. Once the water and minerals reach the xylem tissue of root. Xylem forms a continuous channel that connects roots to the leaves through the stem and branches. The xylem transports water and minerals upwards due to transpiration pull created by the process of transpiration.



3. Describe the course of circulation of blood in our body with the help of a flow chart.



4. Paheli uprooted a rose plant from the soil. Most of the root tips, with root hairs got left behind in the soil. She planted it in a pot with new soil and watered it regularly. Will the plant grow or die ? Give reason for your answer.

Possible answers are :

- Without the root hairs the roots will not be able to absorb water and nutrients and the plant will die.
- The stem of the rose plant may grow new roots and the plant will live.
- The rose plant may not be able to survive in a different type of soil.

5. While learning to ride a bicycle Boojho lost his balance and fell. He got bruises on his knees and it started bleeding. However, the bleeding stopped after some time.

- (a) Why did the bleeding stop ?
- (b) What would be the colour of the wounded area and why ?
- (c) Which type of blood cells are responsible for clotting of blood ? [NCERT Exemplar]
- (a) A blood clot had formed.
- (b) Dark red due to clotting of blood.
- (c) platelets.

### I. Long Answer Type Questions.

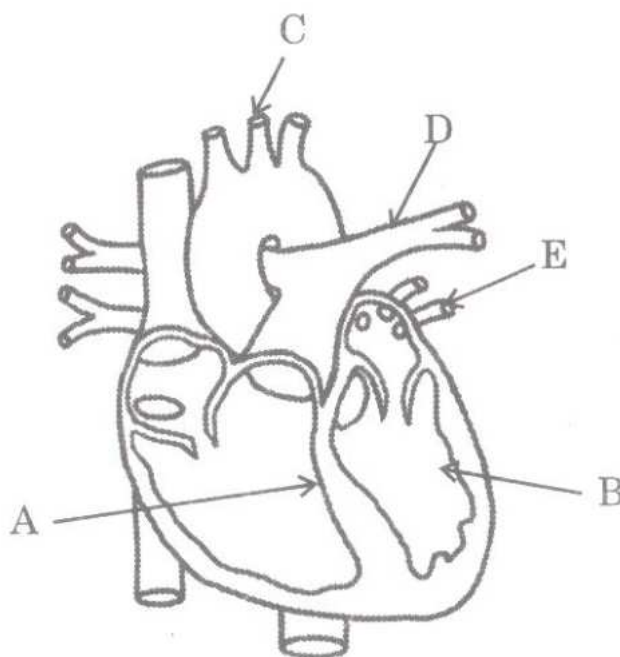
1. Describe in brief the process of formation of urine and its elimination.

Kidney have coiled structures (nephrons) surrounded by blood capillaries. When blood passes from them, all useful and harmful substance are filtered from blood. While passing through the capillaries all the useful substance present in filtered fluid are reabsorbed by



blood. The waste product urine is then passed into urinary bladder through ureter. When the bladder is full, the same is removed through urethra.

## 2. Label five parts (A to E) of heart and state their functions.



A - Septum between right and left side of heart. It prevents mixing of oxygenated and deoxygenated blood.

B - Left ventricle, which pumps oxygenated blood to body parts.

C - Aorta is the main artery emerging from left ventricle. It gives rise to other arteries which carry blood to different body parts.

D - Left auricles, which receives oxygenated blood from lungs and pushes it into left ventricle.

## 3. Explain the composition of blood.

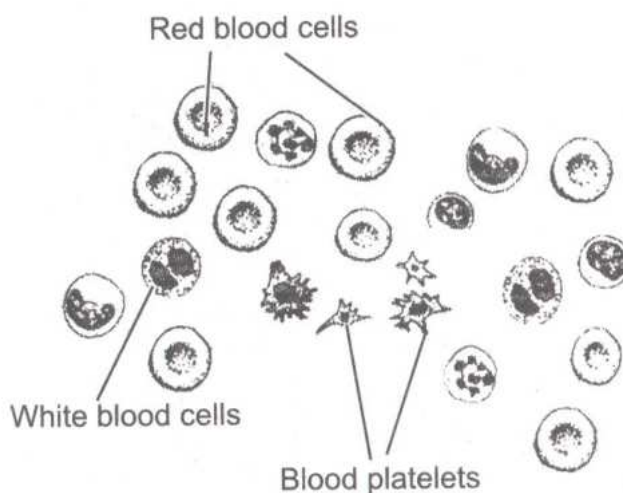
Blood is a liquid which is composed of following two parts.

i. **Plasma** : The fluid parts of the blood is called plasma.

ii. **Cells** : There are three kinds of cells suspended in the plasma of blood.

a. **Red Blood cells (RBC)**: These cells contain a red pigment called haemoglobin.

Haemoglobin binds with oxygen and transports it to all the parts of the body and ultimately to all cells. It will be difficult to provide oxygen efficiently to all the cells of the body without haemoglobin. Due to the presence of haemoglobin the blood appears red.



**b. Platelets** : The third type of cells found in the blood are platelets. Their function is to form clot to prevent loss of blood when we are injured.

**c. White Blood Cells (WBC)** : WBCs fight against germs that may enter our body and thus protect us from infection.

#### 4. What is blood?

- Write any two function of blood.
- Name the various component of blood.

**Blood is a fluid which flows in blood vessels.**

##### a. Function of blood:

- It transport digested food from small intestine to all parts of the body.
- It carries oxygen from lungs to cell.

##### b. Components of blood.

- Fluid : Plasma
- Cells : RBC, WBC, Platelets.

#### 5. Arrange the following statements in the correct order in which they occur during the formation and removal of urine in human beings.

- Ureters carry urine to the urinary bladder.
- Wastes dissolved in water is filtered out as urine in the kidneys.
- Urine stored in urinary bladder is passed out through the urinary opening at the end of the urethra.
- Blood containing useful and harmful substances reaches the kidneys for filtration.
- Useful substances are absorbed back into the blood.

[NCERT Exemplar]

d → e → b → a → c.

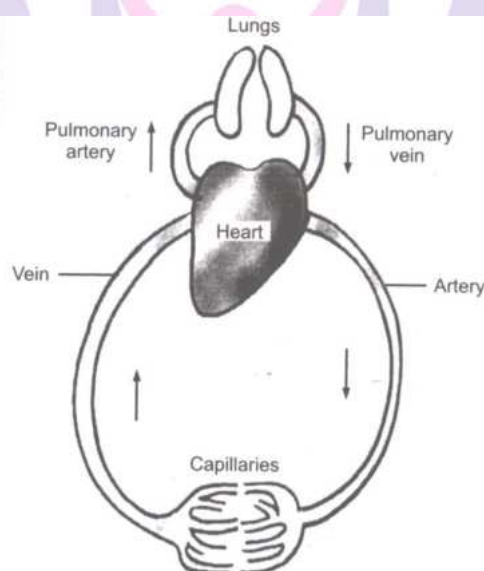
## II. Long Answer Type Questions.

### 1. Explain the structure and working of heart.

The heart is an organ which beats continuously to act as a pump for the transportation of blood which carries other substances with it. Our heart works like a non-stop pump. The heart is located in the chest cavity with its lower tip slightly tilted towards the left. Heart's size is roughly the size of the fist. The heart is four chambered. The upper two chambers are called atria (singular atrium) and the two lower chambers are called the ventricles.

The partition between the chambers helps to avoid mixing up of blood rich in oxygen with the blood rich in carbon dioxide.

Working: The veins collect the blood rich in carbon dioxide from various organs and release it into the heart. The blood flows from heart to the lungs where it is purified and then sent back to heart from where it is pumped to rest of the body through arteries.



### 2. Complete the following table by conducting a test survey in your class:

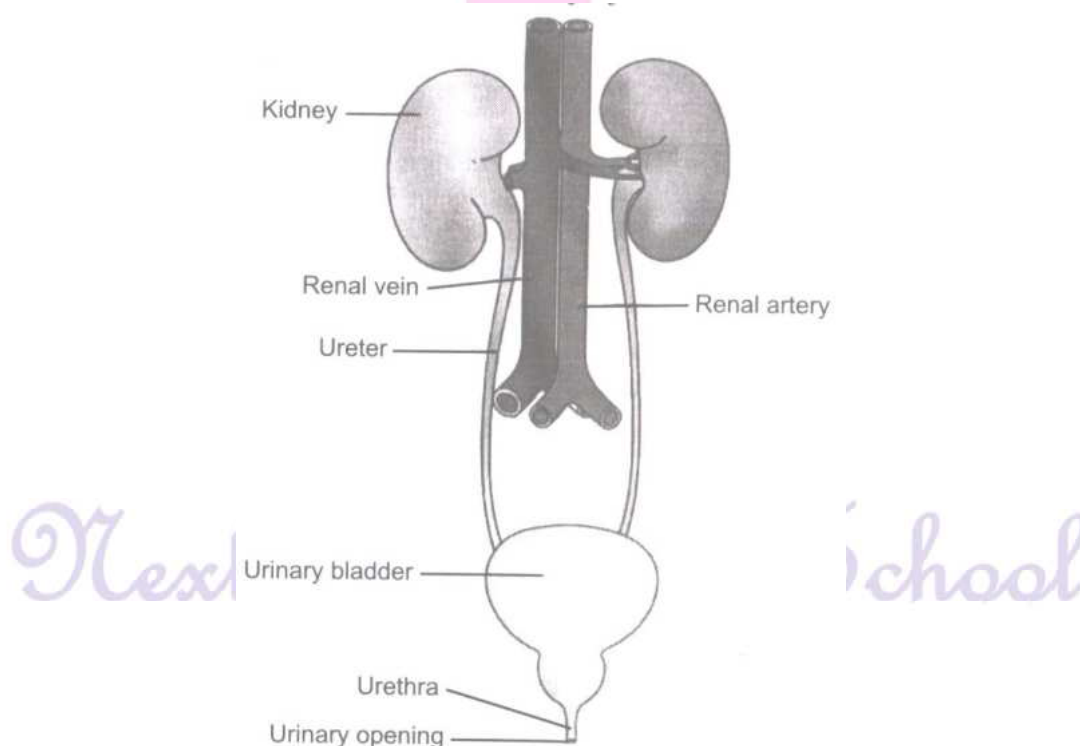
Table 11.2: Heartbeat and pulse rate

Name of student	While resting		After running (4- 5 minutes)	
	Heart beat	Pulse rate	Heart beat	Pulse rate

	While resting		After running (4- 5 minutes)	
Name of student	Heart beat	Pulse rate	Heart beat	Pulse rate
Rakesh	72	72	78	78
Shyam	75	75	80	80
Ramesh	76	76	80	80
Monu	72	72	78	78
Sonu	74	74	78	78
Ankur	75	75	80	80

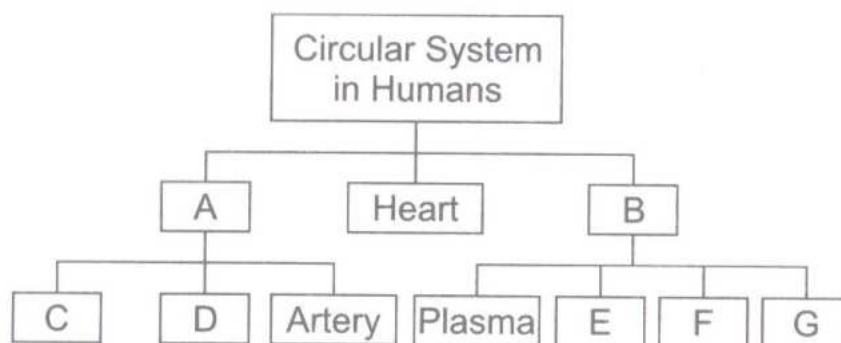
### 3. Explain the excretory system in human beings.

The waste which is present in the blood has to be removed from the body. A system to filter the waste is required. This is done by the blood capillaries in the kidneys. When blood reaches the two kidneys, it contains both useful and harmful substances. The useful substances are absorbed back into the blood after filtration in kidneys. The waste dissolved in water are removed as urine. From the kidneys the urine goes into urinary bladder through tubes called ureters. It is stored in the bladder and is passed out through the muscular tube called urethra. The kidneys, ureters, urinary bladder and urethra form the excretory system.





4. Complete the following flow chart by replacing the letter A to G from actual words and write the function of arteries and veins.



A : Blood vessel

B : Blood

C : Vein

D : Capillaries

E : RBC

F : WBC

G : Platelets

Functions of Arteries and Vein

**Artery:** Artery carries blood (oxygenated) from heart to tissues.

**Veins :** Veins bring back the deoxygenated blood from tissue to heart.

### III. Long Answer Type Questions.

1. Read the following terms given below.

root hairs	xylem	urthra
arteries	kidneys	veins
atria	capillaries	heart
urter	phloem	urinary bladder

Group the term on the basis of the categories given below.

a. Circulatory system of animals.

b. Excretory system in human.

c. Transport of substances in plants. [NCERT Exemplar]

a. Arteries, atria, capillaries, veins, heart.

b. Urter, kidneys, urthra, urinary bladder.

c. Root hairs, xylem, phloem



2. While learning to ride a bicycle Boojho lost his balance and fell. He got bruises on his knees and it started bleeding. However, the bleeding stopped after some time.

- Why did the bleeding stop?
- What would be the colour of the wounded area and why?
- Which type of blood cells are responsible for clotting of blood?

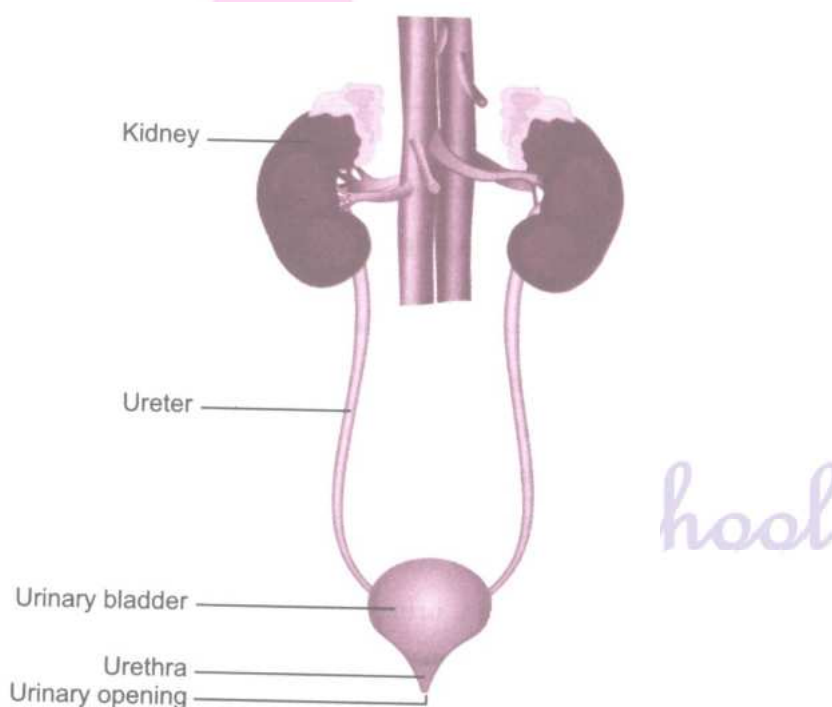
[NCERT Exemplar]

- The bleeding stopped because blood clot had formed.
- The colour of the wounded area would be dark red due to clotting of blood.
- Platelets are responsible for clotting of blood.

3. Give an experiment to show the upward movement of water in plants.

- Take a potted plant.
- Cover it by polythene so that its roots along with soil get completely covered. This will prevent evaporation of water from the soil.
- Put a bell jar over the potted plant.
- Apply Vaseline on the rim of the jar, this will prevent air from entering the jar from outside.
- Keep this set-up in the sunlight for some time.
- You will find drops of water on the inner side of the bell jar. These drops are due to the process of transpiration.

4. Draw a diagram of the human excretory system and label the various parts. [NCERT]





## 5. Distinguish between the following.

### a. Excretion and Transpiration

### b. Blood and Plasma

#### a.

S.No	Xylem	Phloem
i	Removal of waste in the form of solids, liquids or gases from the body of organisms.	The constant evaporation of water from the leaves to form water vapour.
ii	It takes place in all living organisms	It takes place only in plants.

#### b.

S.No	Xylem	Phloem
i	It is the connective tissue in human body	It is the watery fluid of blood
ii	It is red in colour	It is pale yellow in colour
iii	It contains two types of cells – white blood cells and red blood cells.	It does not contain any cells but is rich in nutrients.

[NCERT]

## 6. Describe the function of the heart.

[NCERT]

The heart is an organ which beats continuously to act as a pump for the transport of blood, which carries other substances with it. The human heart is divided into four chambers. The upper two chambers are called right and left atrium and the lower two chambers are called the right and left ventricles. Right atrium receives carbon dioxide-rich blood from the body. Blood from right atrium enters the right ventricles, which contracts and pumps the blood to the lungs. On the other hand, oxygen-rich blood from the lungs returns to the left atrium. From the left atrium, blood enters left ventricle. Left ventricle contracts and pumps the blood to all parts of the body.

Hence, the rhythmic contraction and expansion of various chambers of the heart maintains the transport of oxygen to all parts of the body.



### **I. High Order Thinking Skills (HOTS) Question.**

#### **1. What would happen if seeds are not able to disperse?**

If seeds are not able to disperse, they will clutter on one place and would not be able to grow properly because of lack of nutrients.

### **II. High Order Thinking Skills (HOTS) Question.**

#### **1. Why should sports persons and athletes drink more water?**

Sports persons expend a lot of energy and, therefore, large amount of water is evaporated from their bodies. To prevent dehydration they should drink more water.

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### **Value Based Question**

#### **1. While cooking food Mrs. Goenka needed help of her daughter Simmi, to chop vegetables. Surprisingly, Simmi, a student of VIIth standard observed that some of the potatoes started to sprout from their notched areas. Obviously a few questions arose in her mind.**

**Answer those questions on behalf of Simmi.**

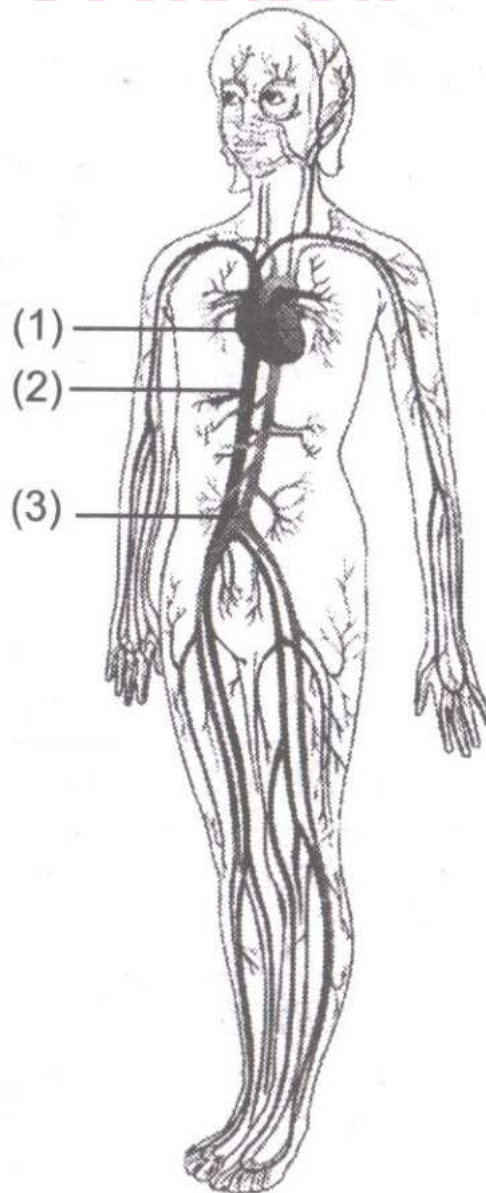
- i. How does the new potato plant sprout from 'potato' itself without seed formation? Also name the method.
  - ii. Are there any other plants which reproduce in the same way?
  - iii. Is there any advantage of this process?
  - iv. Which value is shown by Simmi?
- 

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### Skill Based Questions

1.
  - i. Observe the following figure and identify.
  - ii. Label parts 1, 2 and 3.



i. This figure shows the circulatory system in human.

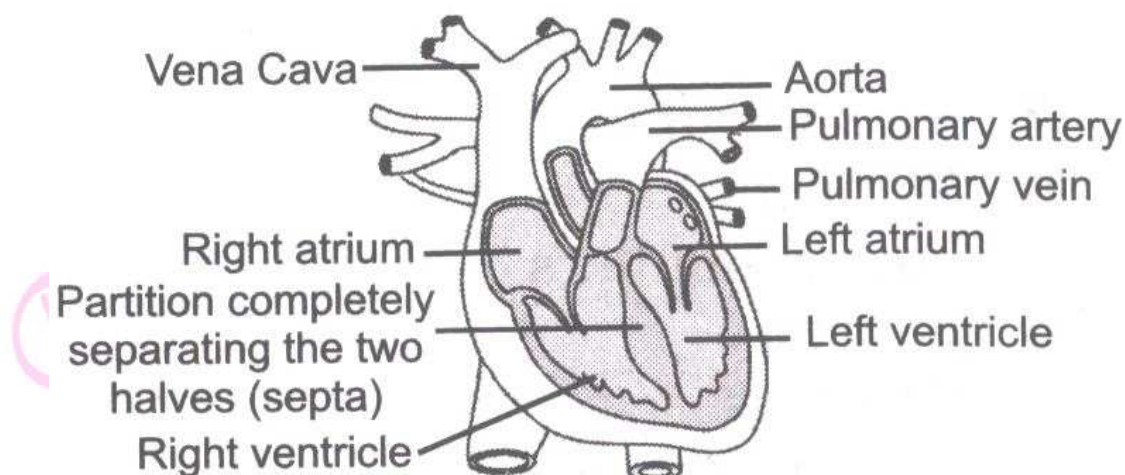
ii. 1 → Heart

2 → Vein

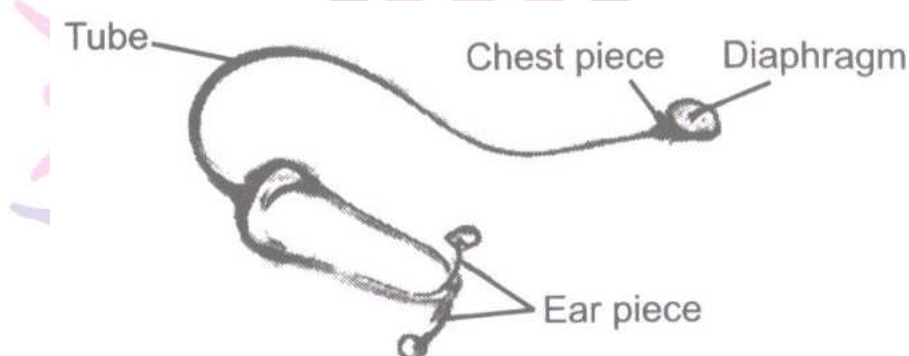
3 → Artery

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2. Draw diagram of human heart and label pulmonary artery, right and left atria, right and left ventricles, septa, pulmonary vein and aorta.

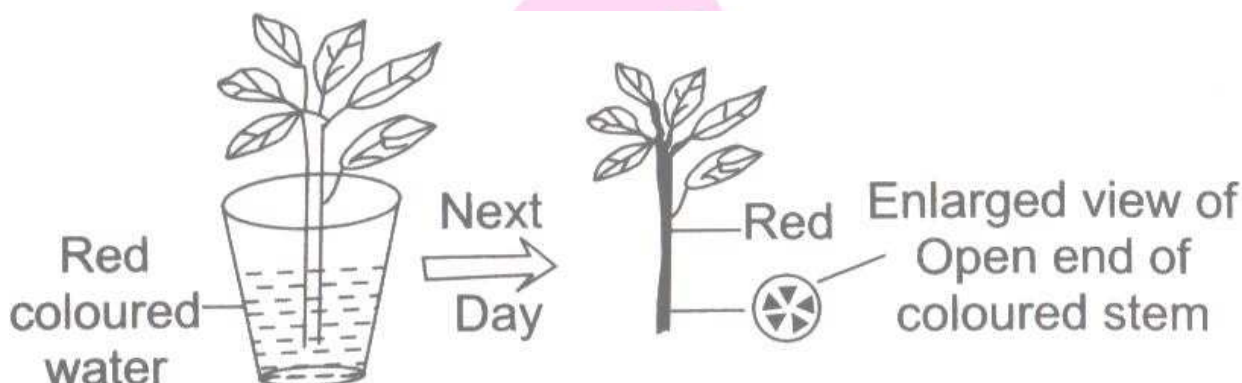


3. Draw a diagram of stethoscope and write its use.



Stethoscope is used by a doctor as a device to amplify the sound of heart.

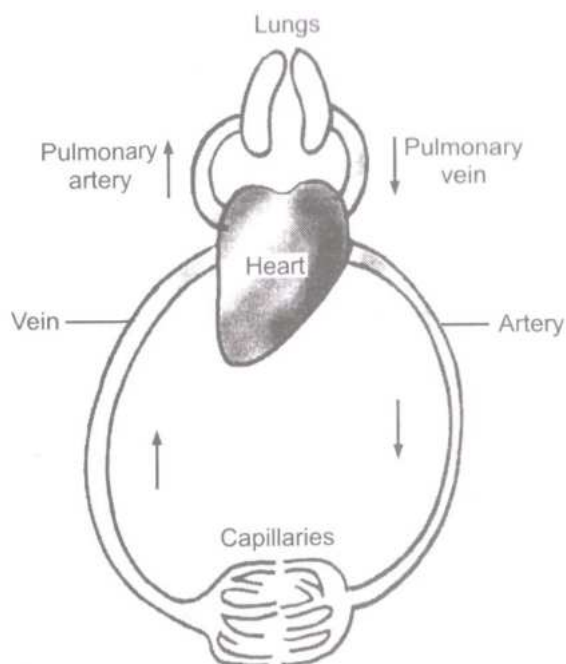
4. Draw a diagram to show transportation of water through cells.



5. Draw schematic diagram of circulation and label the following parts (organs).

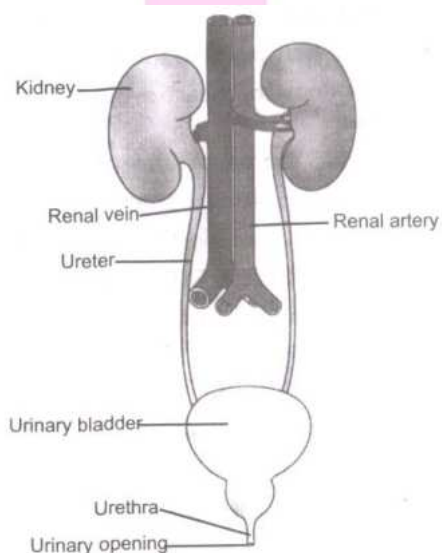
- |                     |                      |
|---------------------|----------------------|
| i. Lungs            | ii. Pulmonary Artery |
| iii. Pulmonary vein | iv. Heart            |
| v. Artery           | vi. Vein             |

vii. Capillaries



6. Draw a diagram of human excretory system and label following parts on it.

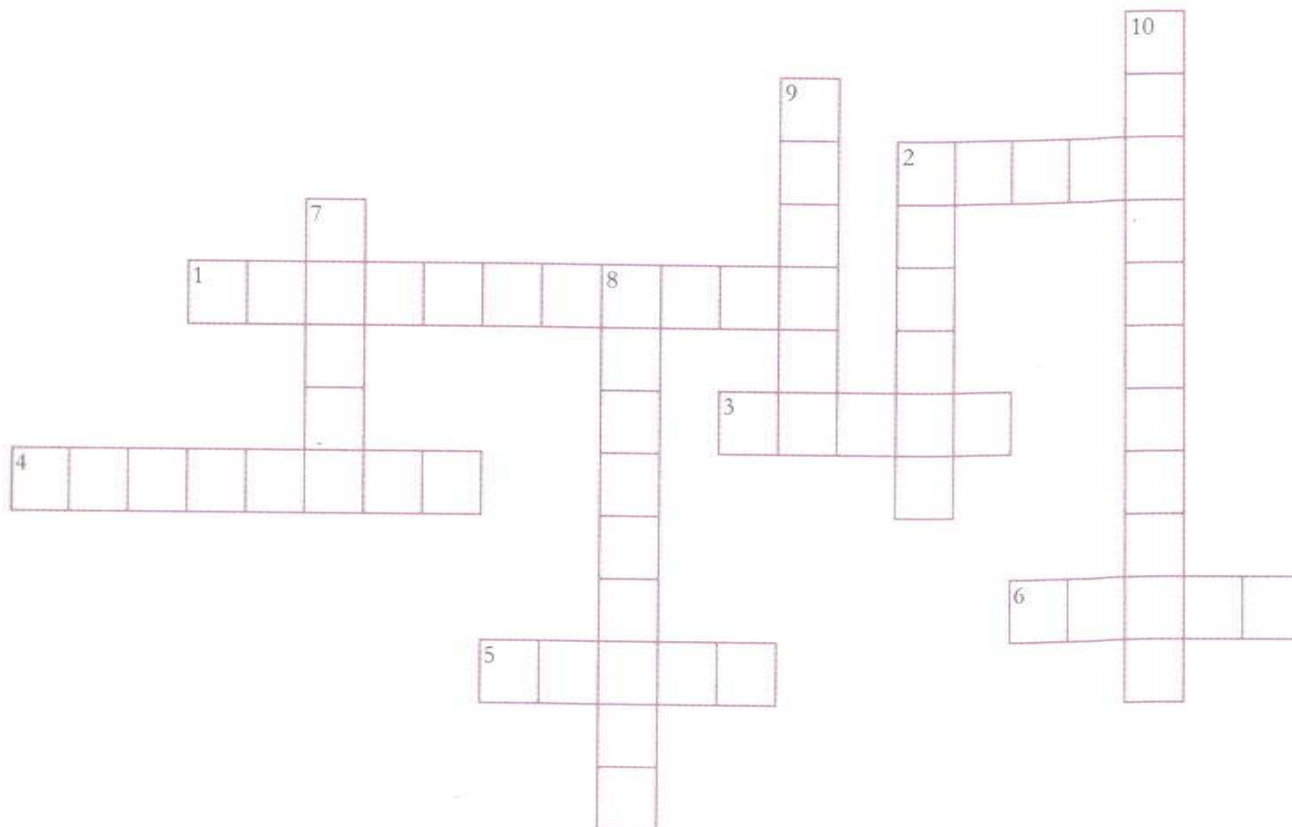
- i. Kidney
- ii. Ureter
- iii. Urinary bladder
- iv. Urethra
- v. Urinary opening



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## Crossword Puzzle

1.



### Across

1. An instrument used to listen to the heart beat.
2. Throbbing movement due to blood flow in the arteries
3. Vascular tissues in plants that transport water and minerals.
4. The process of artificial filtration of blood in case of kidney failure.
5. The muscular organ that pumps blood.
6. Liquid waste excreted from the kidney.

### Down

2. Vascular tissue that transport food in plants.
7. Blood vessels that carry deoxygenated blood
8. Thin blood vessels that connect arteries and veins
9. Blood vessel that carries oxygenated blood
10. The red pigment in the blood that binds with oxygen.

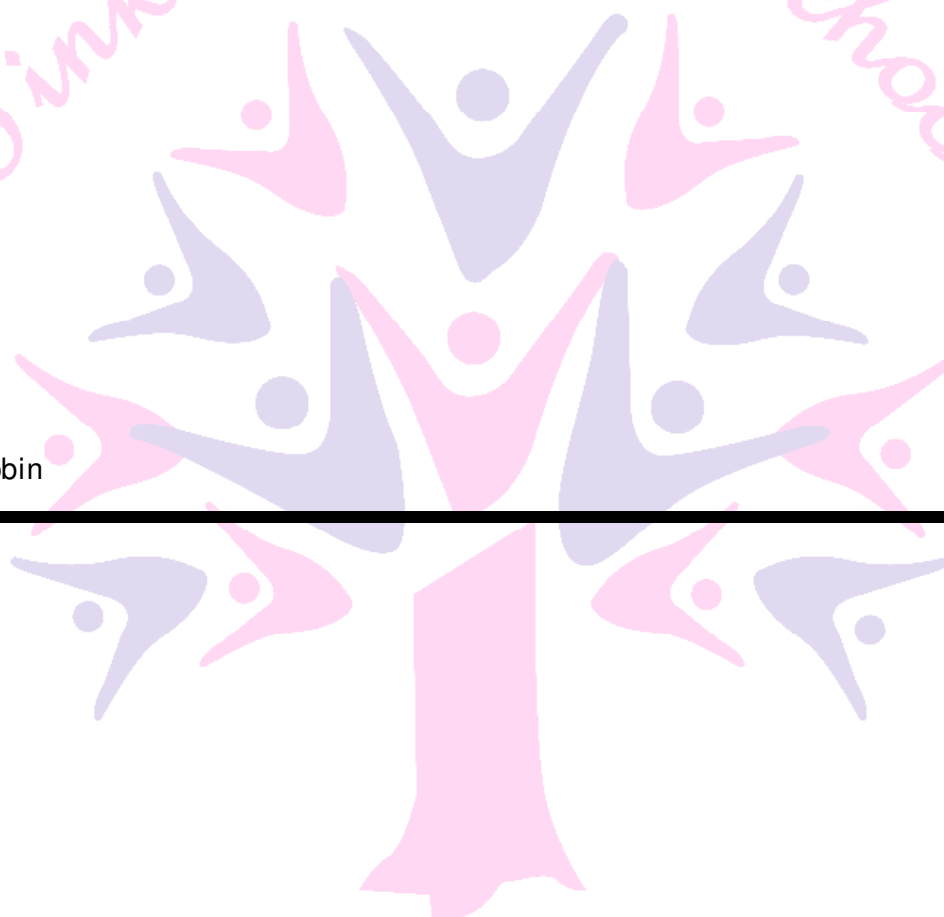
**Across**

1. stethoscope
2. pulse
3. xylem
4. dialysis
5. heart
6. urine

**Down**

2. phloem
  7. veins
  8. capillary
  9. artery
  10. haemoglobin
- 

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