



Unit

5

BIOLOGY

MOVEMENTS

TEXT BOOK EXERCISES

I. Choose the correct answer.

1. Which of the following parts of our body help us in movement?

- (i) Bones (ii) Skin
(iii) Muscles (iv) Organs

Choose the correct answer from the option below.

- (a) (i) and (iii) (b) (ii) and (iv)
(c) (i) and (iv) (d) (iii) and (ii)

[Ans: (a) (i) and (iii)]

2. Which one of the following organisms lack muscles and skeleton for movement?

- (a) dog (b) snail
(c) earthworm (d) human being

[Ans: (c) Earthworm]

3. _____ joints is immovable?

- (a) Shoulder and arm (b) Knee and joint
(c) Upper jaw and skull (d) Lower jaw and upper jaw

[Ans: (c) Upper jaw and skull]

4. Why do underwater divers wear fin-like flippers on their feet?

- (a) swim easily in water. (b) look like a fish.
(c) walk on water surface. (d) walk over the bottom of the sea (sea bed).

[Ans: (a) swim easily in water.]

5. External ear (pinna) is supported by

- (a) Bone (b) Cartilage
(c) Tendon (d) Capsule

[Ans: (b) Cartilage]

6. Cockroach moves with the help of its

- (a) leg (b) bone
(c) muscular foot (d) whole body

[Ans: (a) leg]

7. Which of one of the following categories of vertebrae are correctly numbered?

- (a) Cervical - 7 (b) Thoracic - 10
(c) Lumbar - 4 (d) Sacral - 4

[Ans: (a) Cervical - 7]



**II. Fill in the blanks.**

- Movement of organisms from place to place is called _____.
[Ans: locomotion]
- _____ refers to change in position of a part of an organism's body.
[Ans: Movement]
- A structure which provides rigid frame work to the body is called _____.
[Ans: skeleton]
- Axial skeleton in human consists of _____, _____, _____ and _____.
[Ans: skull, ribs, sternum, and vertebral column]
- Appendicular skeleton in human consists of _____ and _____.
[Ans: Pectoral Girdle and Pelvic Girdle]
- The place where two bones meet is termed as _____. [Ans: Joint]
- _____ is attached to soft parts of the body like blood vessels, iris, bronchi and the skin.
[Ans: Non-striated]
- _____ muscle makes pupil of eyes wider.
[Ans: Radial]

III. State True or False. If false, correct the statement.

- Skull in humans consists of 22 bones. [Ans: True]
- There are 12 pairs of ribs in human body. [Ans: True]
- Pelvic girdle is a part of axial skeleton.
[Ans: False]
Corrected statement : Pelvic girdle is a part of appendicular skeleton.
- Hinge joint is slightly movable joint. [Ans: False]
Corrected statement : Hinge joint is freely movable joint.
- Cardiac muscle is a voluntary muscle. [Ans: False]
Corrected statement : Cardiac muscle is a involuntary muscle.
- The flexor and extensor muscle of the arm are antagonistic muscles. [Ans: True]

IV. Answer very briefly.**1. What is skeleton?**

The hard structure or framework which supports and protects the body is known as skeleton.

2. What is cranium?

The bones of the skull which encloses the brain is called as cranium.

3. Why our backbone is slightly moveable?

The vertebrae of backbone are joined by gliding joint. It allows only very (Partial) movement between two vertebrae.





4. Differentiate axial and appendicular skeleton.

No.	Axial skeleton	Appendicular skeleton
1.	It consists of the bones along the axis, or central line, of the human body.	It contains the bones in the appendages of the body, as well as the structures that connect the appendages to the axial skeleton.
2.	It consists of the skull, sternum (breastbone), ribs, and vertebral column.	It comprises the pectoral girdle and the pelvic girdle.

5. What is ligament?

Ligaments are short bands of tough fibrous connective tissue that function to connect one bone to another, forming the joint.

6. Define Muscle.

Muscle is the bundle of contractile tissue.

7. Differentiate tendons and ligament.

No.	Tendons	Ligaments
1.	They are strong and non flexible fibrous cords of tissue.	They are flexible and elastic fibrous cords of tissue.
2.	They attach muscle to bone.	They attach bone to bone.
3.	Tendons connect end of the muscles to any place of the bone.	It connects bones to bones at a joint.

V. Answer briefly.

1. Differentiate between the following

a) Movement and Locomotion.

No.	Movement	Locomotion
1.	Movement is the act of changing the place or position by one or more parts of the body.	Locomotion is the movement of an organism from one place to another.
2.	It can either be voluntary or involuntary.	It is always voluntary.
3.	A movement takes place at the biological level.	Locomotion takes place at the organism level.
4.	Movement requires energy.	Locomotion doesn't necessarily require energy.





b) Endoskeleton and Exoskeleton

No.	Endoskeleton	Exoskeleton
1.	It is the skeleton that is found on the exterior layer of the body.	It is the skeleton that is found inside the human body.
2.	It basically originates from embryonic ectoderm or mesoderm.	It originates from the mesoderm.
3.	Scales in the fishes, outer hard layer of the tortoise and feathers of the birds.	It is found in almost all vertebrates.
4.	It protects and preserves the inner organs	It forms the main body structure.

c) Pectoral and Pelvic girdle

No.	Pectoral girdle	Pelvic Girdle
1.	It is situated in the shoulder region.	It is situated in the hip region.
2.	It is made up of two bones, i.e. Clavicle and Scapula.	It is made up of three bones, i.e. Ilium, Ischium and Pubis.
3.	It gives articulation to forelimb bones.	It gives articulation to hindlimb bones.
4.	The back muscles are attached to the pectoral girdle.	The hip muscles are attached to the pelvic girdle.
5.	It is relatively less strong.	It is relatively more strong.

d) Ball and socket Joint and Hinge Joint

No.	Ball and socket joint	Hinge joint
1.	A ball shaped head of one bone articulates with a cup like socket of an adjacent bone.	A cylindrical protrusion of one bone articulates with a trough-shaped depression of an adjacent bone.
2.	Movement can occur in three planes.	Movement is restricted to one plane.
3.	This joint allows the greatest range of movement.	This joint allows bending and straightening only.
4.	Example : Shoulder Hip	Example : Elbow Knee Ankle

e) Voluntary and Involuntary muscle

No.	Voluntary muscle	Involuntary muscle
1.	They are under our will or control.	They are not under our will or control.
2.	They are also called striated muscles since they show stripes or striations.	They are also called non-striated muscles since they lack striations.





3.	Their cells are long and cylindrical.	Their cells are small and spindle shaped.
4.	They have multinucleate cells.	They have uninucleate cells.
5.	Biceps, triceps, respiratory, alimentary and urogenital tracts are the places where voluntary muscles are found.	Cardiac Muscle, abdominal muscles, locomotory muscles, middle ear muscles, Diaphragm are the examples of the involuntary muscles.

2. What are antagonistic muscles? Give one example.

Antagonistic muscles are actually the muscle that opposes the action of another muscle. Muscles often work in pairs which work against each other.

Example : The pair of biceps and triceps are antagonistic muscles. They are working against each other. When the biceps contracts the lower arm is raised and the arm bends. In this position the triceps muscle is relaxed. To straighten the arm the reverse happens.

3. How is the skeleton of a bird well-suited for flying?

- Bones of birds are light and strong.
- They are hollow and have air spaces between them.
- The breast bones are modified to hold massive flight muscles which help in moving wings up and down.

4. What are the functions of skeleton in human body?

- It provides structure and shape to the body.
- It supports and surrounds the internal organs of the body.
- Calcium and phosphorus, the two minerals that the body needs for important regulatory functions, are stored inside the bones.
- Red blood cells are produced in the bone marrow.
- The bones of the skeletal system act as levers for muscular action.

VI. Long answer type.

1. Name the different types of joints? Give one example for each type.

Depending on the type of movement they allow, joints can be of three types:

I. Fixed or Immovable joints :

- In this type of joint no movement is possible between the two bones.
- Example : The structures between the bones of the skull box.

II. Slightly movable joints :

- Here, only very little (partial) movement occurs between the two bones.
- **Example:** The joint between a rib and the breast bone or between the vertebrae.





III. Freely movable joints :

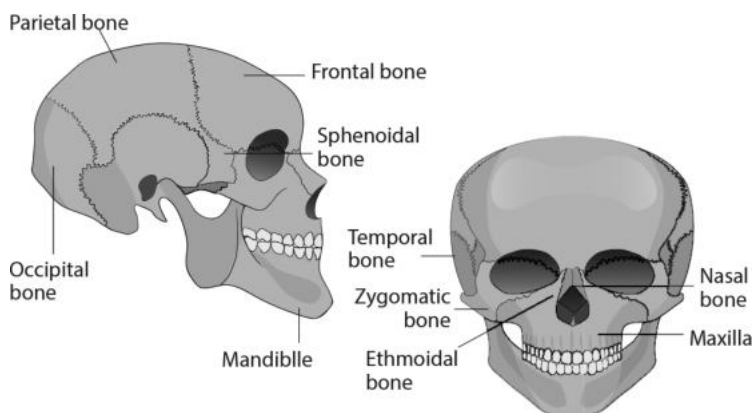
In this type, varying degree of movements is possible between the two bones forming the joint. There are six major types of movable joints.

No.	Movable joints	Examples
1.	Ball and Socket	Shoulder and Hip
2.	Hinge	Elbow, Knee and Ankle
3.	Pivot	Spine (Atlas / Axis joint at the top)
4.	Condylloid	Wrist
5.	Gliding	Spine (between the bony processes of the vertebrae)
6.	Saddle	Thumb, shoulder and inner ear.

2. Write about the human axial skeleton, giving suitable labelled diagram.

The axial skeleton consists of the bones along the axis, or central line, of the human body.

a. Skull :

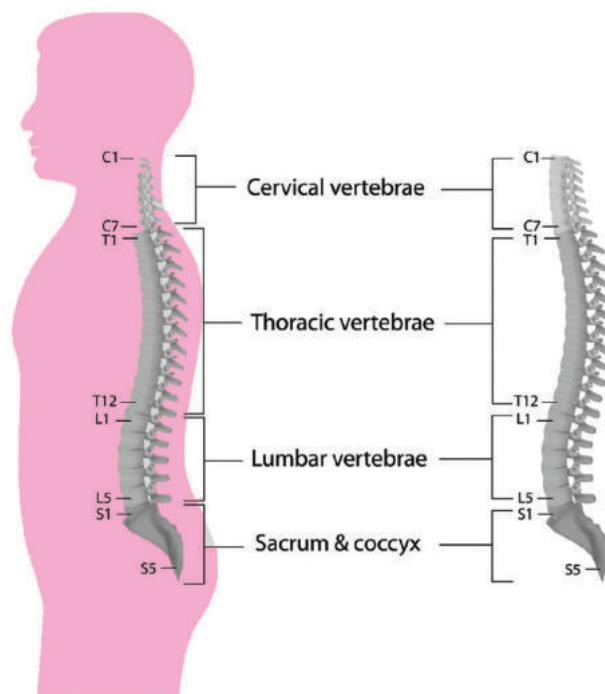


- Skull is a hard structure made up of small bones.
- It is formed by 22 bones out of which 8 bones are fixed together to form the cranium and 14 bones fuse to form the face.

b. Vertebral column

- Vertebral column running at the back of the body is also called as spine or the backbone.
- It is in the trunk region to offer support to the upper part of the body.
- Vertebral column is made up of individual bones called as vertebrae.
- Total vertebral column (33) consists of 7 cervical vertebrae, 12 thoracic, 5 lumbar vertebrae, 5 fused sacral and 4 fused coccygeal vertebrae.

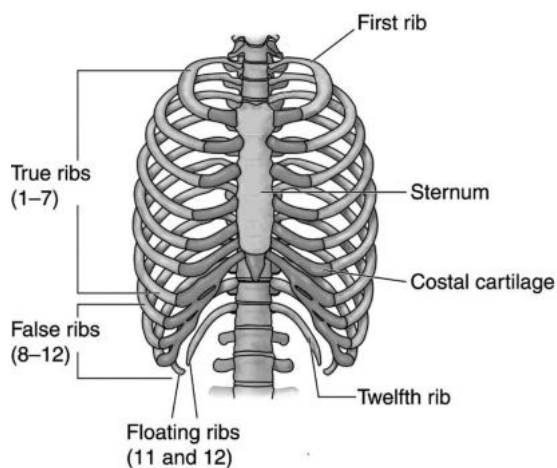




The functions of vertebral column are given below.

- It protects the spinal cord.
- It supports the head.
- It serves as an attachment for the ribs.
- It provides support and place of attachment for the pectoral and pelvic girdle.
- It provides movement for the human skeleton.
- It helps in walking and standing erect, correct posture.

c. Sternum or Rib cage :





- Rib cage occupies the chest region. It is a cone-shaped structure made up of 12 pairs of ribs.
- Rib cage is set up in such a way that it can contract and expand during the process of breathing. Rib cage protects the underlying lungs, heart and some part of liver.

3. Discuss various types of movements seen in living organisms.

1. Earthworm

- The body of earthworm is made up of many rings joined end to end.
- It has muscles which help to extend and shorten the body.
- Under its body it has large number of bristles called setae which are connected with muscles. These bristles help to get grip on the ground.
- During movement, the earthworm first extends the front part of body, keeping the rear portion fixed to the ground.
- Then it fixes the front end and releases the rear end. It then shortens the body and pulls the rear end forward.
- This makes it forward by small distances.
- Repeating such muscle contraction and relaxations the earthworm can move through soil.
- A slimy substance secreted by its body helps this movement.

2. Cockroach

- A cockroach has three pairs of jointed legs, which help it to walk, run and climb.
- It also has two pairs of wings for flying.
- Large and strong muscles help in the movement of legs.
- The body is covered by chitin, a light protective material.
- Chitin is shed regularly so that the body can grow.

3. Birds

- Birds can walk on the ground and fly as well.
- Some birds can also swim in the water.
- A bird has streamlined body. Its bones are light and strong.
- They are hollow and have air spaces between them.
- The hind limbs of birds are modified as claws, which help them to walk and to perch.
- The breast bones are modified to hold massive flight muscles which help in moving wings up and down.
- Birds have special flight muscles and the forelimbs are modified as wings.





- The wings and tail have long feathers, which help in flying. Birds show two types of flight: gliding and flapping.

4. Snake

- The body of snake consists of a large number of vertebrae.
- The adjoining vertebrae, ribs and skin are inter-connected with slender body muscles.
- When the snake moves, it makes many loops on its sides.
- The forward push of the loops against the surface makes the snake move forward.
- Movement of snake is called slithering movement. Many snakes can swim in water also.

5. Fish

- Fish swims with the help of fins.
- They have two paired fins and an unpaired fin.
- The body of a fish is streamlined to reduce friction while moving in water.
- They have strong muscles, which help in swimming.
- When a fish swims its front part curves to one side and the tail part stays in the opposite direction.
- In the next move, the front part curves to the opposite side and the tail part also changes its position to another side.
- The caudal or tail fin helps in changing direction.

4. What is a streamlined body? How does it help in the movement of animals that fly or swim in water?

- The body that is thicker in the middle and tapers at both ends, it is known as streamlined body. This shape is known as streamlined body.
- In order to overcome the friction, animals are adapted with a streamlined shape.
- The shape of birds and certain animals like fishes are called streamline.
- This shape allows water to move easily around the body and offers least resistance to its flow thus it helps the animal to swim easily.
- This shape also helps the bird to fly as it makes it easy for them to move through the air. The air can easily cut through the sides of the body and offers least resistance

5. Write a short note on different types of muscles.

Muscles found in higher vertebrates are of three types:

- Striated or skeletal muscles or voluntary muscles
- Unstriated or smooth muscles or involuntary muscles and
- Cardiac muscles





Muscle	Location	Characteristics
Striated / Skeletal / Voluntary muscle	Attached to bones. Found in arms, legs, neck.	Multinucleate, Unbranched and Voluntary.
Non striated / Smooth / Involuntary	Attached to soft parts of the body like blood vessels, iris, bronchi and the skin.	Single, central nucleus and Involuntary.
Cardiac	Heart.	Branched, 1 -3 central nuclei Involuntary.

Activity**1****B.P.No.52**

Observe an earthworm moving on soil in the garden. Gently lift it and place it on a piece of blotting or filter paper. Observe its movement now. In which of the above two surfaces do you find that the earthworm is able to move easily?

Earthworms will move faster on a rough surface such as wet soil. This is because of higher traction on rough surfaces which helps their body to grip the surface. It will become slower on a piece of blotting or filter paper because its body does not get any grip with the surface of the filter paper. The filter paper may also be dry, in which the worm will lose moisture and end up sticking to the filter paper.

Activity**2****B.P.No.53**

Observe a cockroach and identify its legs and wings. Try to know more about other parts of cockroach with the help of your teacher.

Body of Cockroach is clearly divisible into three regions that is, head, thorax and abdomen.

- Head is formed of by the fusion of six segments. The head bears a pair of compound eyes, a pair of antennae and appendages around the mouth.
- The thorax consists of three segments and each segment bears a pair of walking legs. There are two pairs of wings arise from thorax.
- The abdomen consist of ten segments. The 10th segment bears a pair of long, tapering anal cerci.

Activity**3****B.P.No.53**

Observe a hen and crow. How do they move? Write about the similarity and dissimilarity in your note book.

In both hen and crow, the forelimbs are modified into wings. Crow spends most of its time in air. Hen is able to efficiently locomote on the ground by their hindlimbs. Due to the lack of ground-based predators, hen has lost the ability to fly. Body weight is a barrier for hen to fly for a long distance.



**Activity****4****B.P.No.54**

Make a paper boat; put it in water and push it with narrow end pointing forward. Now hold the boat sideways and push it into water from the broad side. What did you observe? In which process was it easy to move the boat? Have you noticed that the shape of a boat is somewhat like a fish?

- The streamlined shape is given to ships in water to reduce the fluid friction.
- The special shape given to the bodies moving in the fluids like ships in water to reduce the fluid friction is called streamlined shape.

Activity**5****B.P.No.61**

Measure the size of your biceps and also ask your friends to do. Take turns lifting a bottle with water as many times as you can. Record the number of lifts each student was able to do. Compare each pair's results with the rest of the class and determine whether those with larger biceps were able to do more lifts.

- Measure the size of your biceps and also ask your friends to do.
- Take turns lifting a water full of bottle as many times as you can.
- Record the number of lifts each student was able to do.
- Compare each pair's results with the rest of the class and determine whether those with larger biceps were able to do more lifts.

No.	Name	Size of biceps	Number of lifts
1.	Balamurugan	24 cm	36
2.	Ashwin	21 cm	29
3.	Joseph	26 cm	42
4.	Vinoth	18 cm	16
5.	Ashraf	23 cm	34

When we compare the results, we came to know that those with larger biceps were able to do more lifts.

ADDITIONAL QUESTIONS**I. Choose the best answer.**

1. Locomotion in earthworm is carried out by _____.

- a) Longitudinal muscle
- b) Circular muscle
- c) Setae
- d) All the above

[Ans: d) All the above]





2. In fish, _____ fin helps in changing direction.

- a) Caudal
c) Ventral

- b) Lateral
d) Dorsal

[Ans: a) Caudal]

3. Arthritis is also caused due to the deposition of _____ crystals in the joints.

- a) Calcium
c) Uric acid

- b) Phosphate
d) Potassium

[Ans: c) Uric acid]

4. _____ reduces friction between the articular cartilage in the joint.

- a) Ligament
c) Tendons

- b) Synovial fluid
d) Joint Capsule

[Ans: b) Synovial fluid]

5. Red blood cells are produced in the _____.

- a) Bone marrow
c) Pancreas

- b) Cartilage
d) Synovial fluid

[Ans: a) Bone marrow]

6. The longest and strongest bone of the human skeleton.

- a) Humerus
c) Femur

- b) Sternum
d) Vertebra

[Ans: c) Femur]

7. Total number of bones in human body _____.

- a) 602
c) 216

- b) 208
d) 206

[Ans: d) 206]

8. Total number of vertebrae in the vertebral column is _____.

- a) 21
c) 33

- b) 12
d) 43

[Ans: c) 33]

9. Skull is made up of _____ bones.

- a) 22
c) 35

- b) 33
d) 43

[Ans: a) 22]

10. Bones found in skull, ribs, shoulder and hips are examples for _____ bones.

- a) Long
c) Flat

- b) Short
d) Irregular

[Ans: c) Flat]

II. Fill in the blanks.

1. The movement of an organism from one place to another is known as _____.

[Ans: Locomotion]

2. The body of cockroach is covered by _____.

[Ans: Chitin]

3. Fish swims with the help of _____.

[Ans: Fins]

4. The fastest mammal in water is _____.

[Ans: Dolphin]





5. The fastest mammal on earth is _____ which can run 76 kilometers per hour.
[Ans: Cheetah]
6. Movement of snake is called _____ movement.
[Ans: Slithering]
7. Our body is made up of a frame work of bones called _____.
[Ans: Skeleton]
8. Rib cage is made up of _____ pairs of ribs.
[Ans: 12]
9. The _____ in the middle ear is the smallest and lightest bone of the human skeleton.
[Ans: Stapes]
10. Knee is covered by a cap like structure called as _____.
[Ans: Patella or knee cap]
11. Amoeboid movement is brought about by _____.
[Ans: Pseudopodia]

III. Indicate whether the following statements are True (T) or False (F).

1. Breathing is an involuntary movement. [Ans: True]
2. Ligaments connect muscle to bone. [Ans: False]
Corrected statement: Ligaments connect bone to bone.
3. Locomotion is always voluntary. [Ans: True]
4. Under its body earthworm has large number of bristles called pseudopodia. [Ans: False]
Corrected statement: Under its body earthworm has large number of bristles called setae.
5. In birds the hind limbs are modified as wings. [Ans: False]
Corrected statement: In birds the fore limbs are modified as wings.
6. Cilia are the hair like extensions of the epithelium. [Ans: True]

IV. Answer very briefly.

1. What is a joint?

The point at which two separate bones meet is called a joint.

2. Match the following.

Column A

- i) Vertebrates
- ii) Earthworms
- iii) Snail
- iv) Skull bones

Column B

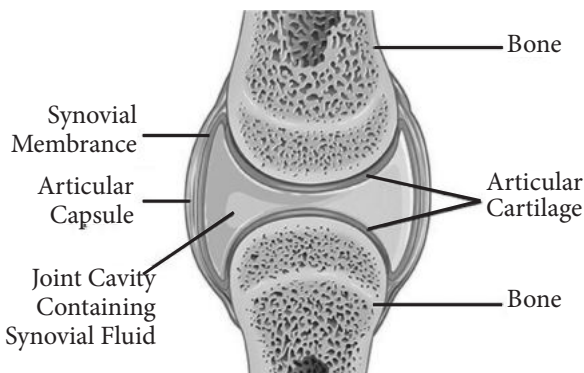
- a) Fixed joints
- b) Muscular foot
- c) Bristles
- d) Have a backbone

[Ans: i.d ii.c iii.b iv.a]

3. Define synovial joint.

A synovial joint is a joint which makes connection between two bones consisting of a cartilage lined cavity filled with fluid, which is known as a diarthrosis joint.



**V. Answer briefly.****1. Draw and label the diagram of Synovial joint.****Synovial Joint in human****2. Describe two types of flight found in birds.**

Birds show two types of flight: Gliding, Flapping.

Gliding:

During gliding the bird has its wings and tail spread out. In this movement the bird uses air currents for going up and down.

Flapping:

This is an active flight. The bird beats the air by flapping its wings. They use flight feathers for this purpose.

3. What is Arthritis?

- Inflammation of joints is a condition usually resulted either due to friction of articulating cartilage (or) due to lack of synovial fluid in the joint.
- During this condition, the person feels acute pain in joints particularly while moving joints. This disease is referred to as arthritis.
- Arthritis is however also caused due to the deposition of uric acid crystals in the joints.

4. What are the different types of bones? Give examples.

There are four types of bones in human skeletal system. They are:

- Long Bones: Found in arms and legs.
- Short Bones: Found in wrist ankle, vertebral column.
- Flat Bones: Found in skull, ribs, shoulder and hips.
- Irregular Bones: Found in spine and vertebral column, mandible, palatine, inferior nasal concha, and hyoid.





VI. Answer in detail.

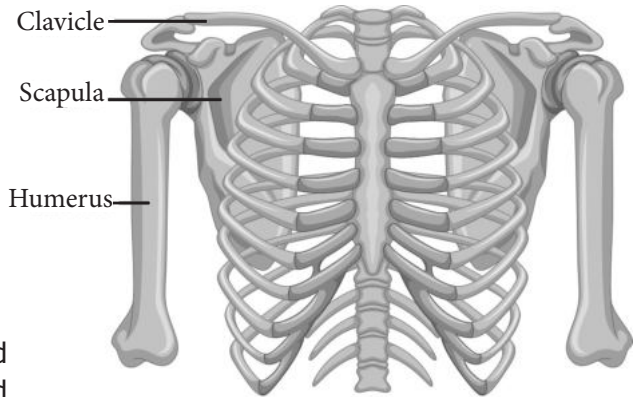
1. Write about the human appendicular skeleton, giving suitable labelled diagram.

The appendicular skeleton contains the bones in the appendages of the body, as well as the structures that connect the appendages to the axial skeleton. Specifically, the appendicular skeleton comprises

I. The shoulder girdle

a. Shoulder bone or Pectoral bone :

- Shoulder bone is formed by collar bone at the front and the shoulder blade at the back.
- The collar bone is supported by breast bone at one end and the shoulder blade at the other end.
- The shoulder bone encloses a socket like cavity into which fixes the ball of the upper arm.
- This forms a ball and socket joint. This girdle is also called as pectoral girdle.



Pectoral girdles

b. Arm bone :

- Arm bone is the upper limb made up of humerus, radius, ulna, carpals, metacarpals and phalanges.
- All these bones are joined by hinge joints which allow the limb to move only in one direction.
- Humerus makes up the upper arm. Fore-arm is made up of radius and ulna. Wrist is made up of carpals. Palm is made up of metacarpals. Fingers are made up of phalanges.

II. The pelvic girdle

a) Pelvic bone :

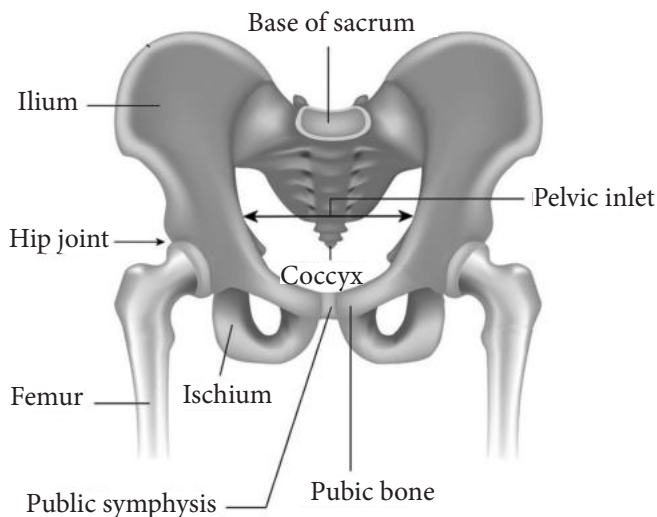
- Pelvic bone is also called as pelvic girdle. It is made up of strong bones to balance entire weight of the body.
- Pelvic girdle is formed by five fused vertebrae at the back and form a cavity in the centre while reaching the front part.
- The thigh bones are attached to either side of the girdle with a ball and socket joint.





b) Leg bone :

- Leg bone is the lower limb made up of femur, tibia, fibula, tarsals, metatarsals and phalanges.
- All these bones are joined by hinge joints which allow the limb to move only in one direction.
- Knee is covered by a cap like structure called as patella or a knee cap.
- Femur makes up the thigh bone. Leg is made up of tibia and fibula. Ankle is made up of tarsals. Foot is made up of metatarsals. Toes are made up of phalanges.



Pelvic bones

2. How is a bird's body adapted for flight?

Birds can walk on the ground and fly as well. Some birds can also swim in the water.

- A bird has streamlined body.
- Its bones are light and strong. They are hollow and have air spaces between them.
- The hind limbs of birds are modified as claws, which help them to walk and to perch.
- The breast bones are modified to hold massive flight muscles which help in moving wings up and down.
- Birds have special flight muscles and the forelimbs are modified as wings.
- The wings and tail have long feathers, which help in flying.

Birds show two types of flight: a) Gliding and b) Flapping.

a) Gliding:

During gliding the bird has its wings and tail spread out. In this movement the bird uses air currents for going up and down.

b) Flapping:

This is an active flight. The bird beats the air by flapping its wings. They use flight feathers for this purpose.





UNIT TEST – 5

Time : 1.15 hrs

Marks: 25

I. Choose the correct answer.**5×1=5**

1. Which one of the following organisms lack muscles and skeleton for movement?

- a) dog b) snail c) earthworm d) human being

2. _____ joints is immovable?

- a) Shoulder and arm b) Knee and joint
c) Upper jaw and skull d) Lower jaw and upper jaw

3. External ear (pinna) is supported by

- a) bone b) cartilage c) tendon d) capsule

4. _____ is bundle of contractile tissue.

- a) bone b) skeleton c) muscle d) joints

5. Arthritis is also caused due to the deposition of _____ crystals in the joints.

- a) calcium b) phosphate c) uric acid d) potassium

II. Fill in the blanks.**5×1=5**

6. Movement of organism from place to place is called _____.
7. A structure which provide rigid frame work to the body is called _____.
8. The place where two bones meet is termed as _____.
9. _____ attached to soft parts of the body like blood vessels, iris, bronchi and the skin.
10. The fastest mammal in water is _____.

III. Write short answer for the following questions.**5×2=10**

11. What is skeleton?
12. What is cranium?
13. What is ligament?
14. How is the skeleton of a bird well-suited for flying?
15. Define synovial joint.

IV. Answer in detail.**1×5=5**

16. Name the different types of joints? Give one example for each type.

(OR)

Write about the human axial skeleton, giving suitable labelled diagram.



Unit

6

BIOLOGY

REACHING THE AGE OF ADOLESCENCE

TEXT BOOK EXERCISES

I. Choose the best answer.

- Adolescence is the period of life between _____ years of age.**
a) 10 to 16
b) 11 to 17
c) 11 to 19
d) 11 to 20
[Ans: c) 11 to 19]
- The period at which an organism attains sexual maturity is called _____.**
a) puberty
b) adolescence
c) growth
d) maturity
[Ans: a) puberty]
- During puberty, the region below the waist become wider in _____.**
a) boys
b) girls
c) both a and b
d) none of these
[Ans: b) girls]
- Adam's apple is the growth of the _____.**
a) pharynx
b) thyroid
c) larynx
d) parathyroid
[Ans: c) larynx]
- Many adolescent boys and girls get pimples on face, due to the secretions of _____ gland.**
a) sweat
b) sebaceous
c) sweat and sebaceous
d) none of these
[Ans: c) sweat and sebaceous]
- The sperm is produced by _____**
a) penis
b) ovary
c) uterus
d) testes
[Ans: d) testes]
- _____ are the chemical substances, secreted by endocrine glands.**
a) Hormones
b) Enzymes
c) Proteins
d) Fatty acids
[Ans: a) Hormones]
- Androgen production is regulated by _____.**
a) GH hormone
b) LH hormone
c) TSH hormone
d) ACTH hormone
[Ans: b) LH hormone]



9. During menstruation, the progesterone level is _____.

- a) decreased b) increased
c) ceased d) normal

[Ans: c) ceased]

10. _____ intake needs to be increased to prevent osteoporosis in later life.

- a) Potassium b) Phosphorus
c) Iron d) Calcium

[Ans: d) Calcium]

II. Fill in the blanks.

1. _____ is secreted by the ovaries of female.

[Ans: Estrogen]

2. The hormones secreted by the gonads are controlled by _____.

[Ans: Anterior Pituitary (Adenohypophysis)]

3. Milk secretion during lactation is controlled by _____ hormone.

[Ans: Prolactin (PRL) / Lactogenic hormone]

4. The male and the female gamete fuse together and form _____.

[Ans: Zygote]

5. The first menstrual flow begins at puberty and it is termed as _____.

[Ans: Menarche]

6. _____ usually occurs 14 days after ovulation.

[Ans: Menstruation]

7. _____ includes protein, carbohydrates, fats and vitamins in requisite proportion.

[Ans: Balanced diet]

8. _____ helps to prevent thyroid gland related diseases.

[Ans: Iodine]

9. Iron deficiency leads to _____.

[Ans: Anaemia]

10. In women fertilization takes place at _____.

[Ans: Fallopian tube]

III. State True or False. If false, correct the statement.

1. There is a sudden increase in the height of both boys and girls during puberty.

[Ans: True]

2. The release of ovum from the uterus is called ovulation.

[Ans: False]

Corrected statement : The release of ovum from one of the ovaries is called ovulation.

3. During pregnancy, the corpus luteum continues to grow and produces large amount of estrogen and progesterone.

[Ans: True]

4. Making use of disposable napkins or tampons may increase the chances of infections.

[Ans: False]

Corrected statement : Making use of disposable napkins or tampons may reduce the chances of infections.

5. Using clean toilets for defecation is a good practice.

[Ans: True]



**IV. Match the following.**

- | | | |
|-----------------|---|-----------------------------|
| 1. Puberty | - | a) Testosterone |
| 2. Adam's apple | - | b) Muscle development |
| 3. Androgen | - | c) at 45 to 50 years of age |
| 4. ICSH | - | d) Sexual maturity |
| 5. Menopause | - | e) Change in voice |

[Ans: 1.d 2.e 3.b 4.a 5.c]**V. Answer briefly.****1. What is adolescence?**

Adolescent is a person who is in the stage of life called adolescence. It is the period of transition from childhood to adulthood. Adolescence period starts at the age of 13 and ends at the age of 19.

2. List out the changes which occur during puberty.

Four important changes that occur during puberty transform the body of a child into that of an adult. These changes are:

- Changes in body size
- Changes in body proportion
- Development of primary sex characteristics
- Development of secondary sex characteristics

3. What is secondary sex characteristics?

Secondary sex characteristics are the physical features which distinguish male from female.

4. What is fertilization?

The fusion of male gamete (sperm) and female gamete (ovum) is known as fertilization. As the result of fertilization zygote is formed.

5. Explain Menarche.

The first menstrual flow begins at puberty and is termed menarche. The unfertilized egg and the thickened lining of the uterus along with its blood vessels are shed off. This causes bleeding in women's reproductive tract.

6. Explain the process of pregnancy.

- After ovulation the ovum reaches the fallopian tube and fertilization takes place.
- The fertilized egg undergoes development and it is implanted in the uterus.
- The corpus luteum continues to grow and produces large amount of progesterone. This results in pregnancy.





7. Explain the importance of cleanliness during the time of menstrual cycle in girls.

Girls should take special care of cleanliness during the time of menstrual cycle.

- Making use of disposable napkins or tampons may reduce chances of infections.
- Girls are advised to use sanitary napkins rather than clothes. It should be changed frequently depending upon the menstrual flow.
- If a cloth is being used repeatedly, it should be cleaned with soap and hot water and dried in sunlight for reuse.

8. How is adolescence differ from childhood?

S.No.	Childhood	Adolescence
1.	Childhood is the age span ranging from birth to adolescence.	It is the period of transition from childhood to adulthood.
2.	This is from the birth to the age of around 12 years.	This is from the age of 13 to 19.

VI. Answer in detail.

1. What are the physical changes that occur in boys and girls during adolescence?

S.No.	Physical changes in Girls	Physical changes in Boys
1.	Height increases.	Height increases.
2.	Fatty and subcutaneous tissues develop.	Muscles develop.
3.	Hip broadens.	Shoulder broadens.
4.	Hair grows in armpits and pubic area.	Hair grows in the armpits, pubic area and the facial hair also appears.
5.	Voice becomes shrill.	Voice break takes place due to lengthening of vocal cord and enlarging of larynx.
6.	Breast bud appears.	Size of the penis increases.

2. Explain the role of hormones in reproduction.

The primary hormones that regulate reproduction are the steroids such as androgens, estrogens and progesterone which have masculinizing, feminizing and gestational effects respectively. These hormones are secreted from the gonads which are regulated by anterior pituitary (adenohypophysis).





1. Follicle Stimulating Hormone (FSH) :

- FSH in the female influences the development of the graafian follicle and secretion of estrogens.
- In the male it is necessary for the development of seminiferous tubules, and for spermatogenesis.

2. Luteinizing Hormone (LH) :

- In the female, it is the hormone necessary for ovulation, formation of the corpus luteum and the secretion of the luteal hormone progesterone, and for the final maturation of the graafian follicle.
- In the male it stimulates the interstitial (Leydig) cells of testes and the secretion of testosterone, and is referred to as the Interstitial Cell Stimulating Hormone (ICSH).

3. Prolactin (PRL) or Lactogenic Hormone :

- Prolactin exerts its control over some paternal behaviour of males.
- Its levels are higher in women.
- It is higher at puberty and declines after menopause.
- The main function of this hormone is milk secretion during lactation and it also induces maternal behaviour.

4. Oxytocin Hormone :

- Oxytocin causes expulsion of milk from the breast and it is also involved in the contraction of smooth muscles of uterus during second stage of labour which helps delivery of foetus.

3. Briefly describe the menstrual cycle.

Menstruation occurs if an ovum released by the ovary of a woman is not fertilized by the sperm during ovulation. This is described below.

- When a girl reaches puberty at the age of about 10 to 20 years, the sex hormones released into her blood cause some of the ova (or egg cells) in her ovaries to become mature (or ripe).
- Usually one mature ovum (or egg) is released from one of the ovaries into the oviduct once in every 28 days. This is called ovulation.
- Before ovulation (or release of ovum), the inner wall of uterus becomes thick and spongy, and full of tiny blood vessels (or blood capillaries). It prepares itself to receive the fertilized ovum.
- If the ovum does not get fertilized then the thick and soft inner lining of uterus is no longer needed and hence it breaks. So, the thick and soft inner lining of uterus along with the blood vessels and the dead ovum comes out of the vagina in the form of a bleeding called menstruation.





- Menstruation usually occurs 14 days after ovulation and usually lasts for about 3 to 5 days.
- After menstruation is over, the inner lining of the uterus starts building up again so that it may become ready to receive the next ovum.
- If the ovum does not get fertilized even now, then menstruation takes place again. This cycle of menstruation is repeated again and again in women after every 28 days. The menstrual cycle is controlled by hormones.
- Menstruation stops temporarily when the ovum gets fertilized and the women gets pregnant. Menstruation restarts after the birth of the baby.

4. Briefly explain the nutritional needs for adolescence.

Balanced diet is very much important during adolescence stage. Balanced diet includes proteins, carbohydrates, fats and vitamins in requisite proportions. A very good amount of proteins and carbohydrates is necessary during this growth period. Apart from that, adolescents need the following dietary components.

Minerals :

Since there is an increase in skeletal mass and blood volume during adolescence, the body needs calcium, phosphorous and iron.

Calcium :

Calcium intake needs to be increased to prevent osteoporosis in later life. It is present in milk and milk products. Milk itself is a balanced food and mother's milk provides proper nourishment.

Iodine :

It helps to prevent thyroid gland related diseases.

Iron :

Iron builds blood and iron-rich food such as green leafy vegetables, jaggery, meat, citrus, Indian gooseberry (Nelli) and whole pulses are good for adolescents. Lack of iron in the diet results in anemia. To make up for the loss, adolescents need to have a diet rich in iron.

VII. Higher Order Thinking Questions.

- What can you suggest to your classmates to keep himself / herself clean and healthy?
 - Shower or bath daily.
 - Always wash your hands before and after meals.
 - Keep fingernails clean and avoid using nail polishes.
 - Wash your teeth and mouth before and after each meal.





- Avoid touching your face, nose or mouth while preparing food.
- Avoid coughing or sneezing around food and close your mouth by using hanky while you cough in a public places.
- If you want to taste the food, use a clean spoon.
- Change your clothes and wash it cleanly, especially undergarments, every day.
- Do not defecate in open field. Use clean toilets for defecation.
- If you are not well, avoid self-medication, consult a doctor.

2. Adolescence is the energetic stage. What health and good habits you want to develop?

- **Establish Healthy Eating Routines:** Healthy eating isn't limited to making healthy food choices. It also talks about eating timely and regularly.
- **Incorporate Physical Activity In Our Daily Life:** Walking every morning, playing some outdoor games or sports will keep us fresh and active every day. Sitting in front of the television or playing video games for hours must be stopped.
- **Establish Good Sleeping Routine:** Following a good sleeping routine will help us to be fresh and fit.
- **Practice Yoga And Meditation:** Practicing yoga exercises and meditation techniques every morning can help us to be active and lead a fit lifestyle.
- **Stay Away From Alcohol And Smoke:** Smoking and drinking alcohol frequently can affect our health adversely.
- **Avoid Spending Hours Online:** Internet addiction may lead to impaired cognitive functions in adolescence and also affect our eyes adversely. So we shouldn't spend long hours online.

Activity

1

B.P.No.66

Divide the students in your class into different groups (Form separate groups for boys and girls). Measure the height and weight of all the students in each group and find out the average. Record your observations in your notebook.

Group 1 (Boys)		
No.	Name	Height in cm
1.	Viswanath	123
2.	Barath	138
3.	Jeffrey	110
4.	Shalith	107
5.	Hari	132
Average height		122

Group 2 (Girls)		
No.	Name	Height in cm
	Haritha	102
	Malavika	121
	Lynda	117
	Shiny	131
	Swarna	119
Average height		118



**Activity****2**

B.P.No.68

Answer the following questions.

- Has your voice changed?
- Are there pimples or acne on your face?
- Do you feel that some changes have taken place in your body?

These changes are normal in your development. Discuss with your teacher or counsellor in your school and clarify your doubts.

Yes, all these changes occurring in us. We discussed with school counsellor. He gave the following information. The changes of puberty are physical, sexual, social and emotional. Puberty starts when changes in your brain cause sex hormones to be released in the ovaries (girls) and testes (boys). During adolescence, young people go through many changes as they move into physical maturity. Early, prepubescent changes occur when the secondary sexual characteristics appear. The sudden and rapid physical changes that adolescents go through make adolescents very self-conscious. They are sensitive, and worried about their own body changes. They may make painful comparisons about themselves with their peers. Puberty is simply a series of natural changes that every child goes through.

Activity**3**

B.P.No.71

Collect data on the number of students in your class who exercise regularly and who do not exercise regularly. Do you notice any difference in their fitness and health? Prepare a report on the benefits of regular exercise.

- Helps you live longer and prevent many chronic diseases.
- Improves cardio, respiratory and muscular fitness.
- Raises your metabolism and helps you lose weight more easily (or eat more without gaining weight).
- Helps reduce stress, anxiety, and depression and improve your mood. .
- Helps maintain brain function in older adults.
- Helps with digestion and promotes regular bowel movements. Physical activity increases bone density.
- Helps you age more gracefully by maintaining your looks and your agility.
- Improves sleep quality.
- Improves your overall quality of life.



**Activity****4**

B.P.No.72

Collect more information on balanced diet and prepare a chart. Display in your class and discuss its importance.

Importance of balanced diet

- Prevents diseases and infections. When you eat the full range of vitamins, minerals and other nutrients you improve your immune system and your healthy diet may even help prevent diseases like cancer, heart disease, diabetes, and stroke.
- Helps you control your weight. Most people at some point want to lose weight or gain weight – eating a balanced diet helps you control your weight and maintain it over time. It is not feasible to be on a weight-loss diet forever – a balanced diet is the only way to healthily control your weight in the long term.
- Improves your mental health. Getting the right mix of nutrients can help to ease symptoms of depression and anxiety – looking after yourself by eating well is essential as you take steps to good mental health.
- Good for growth. A balanced diet is crucial for children and adolescents. As the body grows it is important to receive the right nutrients so that cells are built and maintained and the body grows at the right pace.
- Better skin and hair. A healthy balanced diet also improves your looks. Eating well contributes to healthy skin and hair and a “glow” that makes you look younger.

Activity**5**

B.P.No.73

Compare your response with that of your friends. Do you think you need to change yourself? Discuss with your teacher.

Answer the following questions.

- **Do you exercise regularly?**
Yes, I do exercise regularly.
- **Do you keep yourself clean?**
Yes, I keep myself clean.
- **When do you go to bed?**
I go to bed around 11 pm.
- **When do you get up?**
I get up at 7 am.

I compared with my friends. I have to change myself regarding sleeping time. Early to bed and early to rise, makes a man healthy wealthy and wise. So I have to go to bed earlier and get up earlier.



ADDITIONAL QUESTIONS

I. Choose the best answer.

- [illegible]

II. Fill in the blanks.

1. _____ sex characteristics are the physical features which distinguish male from female.
[Ans: Secondary]
2. In girls, _____ is hardly visible from outside because of its small size and so the voice becomes high pitched.
[Ans: larynx]
3. After ovulation the ovum reaches the _____.
[Ans: fallopian tube]
4. The _____ marks the end of the reproductive phase of a woman's life.
[Ans: menopause]
5. The menstrual cycle begins with the casting off of _____ lining of the uterus and bleeding.
[Ans: Endometrial]

III. True or False. If false, correct the statement.

1. The average age for the onset of puberty is 12 or 13 for girls and 10 or 11 for boys.

False

Corrected statement : The average age for the onset of puberty is 10 or 11 for girls and 12 or 13 for boys.



2. Stoppage of menstruation is termed as 'menopause'.

True

3. The first menstrual flow begins at puberty and is termed menopause.

False

Corrected statement : The first menstrual flow begins at puberty and is termed menarche.

4. Oxytocin causes expulsion of milk from the breast.

True

5. One mature ovum is released from one of the ovaries into the oviduct once in every 14 days.

False

Corrected statement : One mature ovum is released from one of the ovaries into the oviduct once in every 28 days.

IV. Match the following.

- | | | |
|-----------------------|---|-----------------------|
| 1. Anterior pituitary | - | a) Anaemia |
| 2. Prolactin | - | b) Thyroid gland |
| 3. Iron | - | c) Adenohypophysis |
| 4. Calcium | - | d) Maternal behaviour |
| 5. Iodine | - | e) Osteoporosis |

[Ans: 1.c 2.d 3.a 4.e 5.b]

V. Answer briefly.

1. Define Gynecologist.

A physician who specializes in treating diseases of the female reproductive organs and providing well-woman health care that focuses primarily on the reproductive organs.

2. What are the two ways of inducing menopause?

The menopause may be induced

- By surgical removal of the ovaries and
- By pelvic irradiation in a woman of any age.

3. Name some iron-rich food.

The following are the iron-rich food:

- | | |
|--------------------------|---------------------------------|
| ● Green leafy vegetables | ● Citrus |
| ● Jaggery | ● Indian gooseberry (Nelli) and |
| ● Meat | ● Whole pulses |

4. What are the common characters in boys and girls of teenage?

- Hair under armpits and
- Hair in pubic region





VI. Answer in detail.

1. What are the Secondary sex characteristics of boys?

The following are the secondary sex characteristics of boys.

- **Hair** : Immediately after the development of primary sex characteristics, pubic hair appears. When the growth of the pubic hair is completed, axillary and facial hair appears.
- **Skin** : The skin becomes coarse and the pores enlarge.
- **Glands** : The oil producing glands in the skin enlarges and due to this acne may appear on the faces.
- **Muscle** : The strength of the muscle increases and it gives shape to arms, legs and shoulders.
- **Breast knot** : Between the ages of twelve and fourteen, breast knots may appear. They may be present for several weeks then its size decreases.
- **Voice** : During this period voice changes occur and the voice becomes husky. Then its pitch drops and the volume increases.

2. What are the secondary sex characteristics of girls?

Girls show the following secondary characteristics at the time of puberty.

- **Hips** :
Due to the enlargement of pelvic bone and the development of subcutaneous fat, the hip becomes wider and rounder.
- **Breast** :
After the enlargement of hips, the breasts begin to develop. The nipples enlarge and the breast becomes larger and rounder.
- **Hair** :
As the hip and breast develop, pubic hair appears. Axillary hair begins to appear and body hair also appears on the limbs.
- **Skin** :
The skin becomes coarser and the pores enlarge.
- **Gland** :
Oil producing glands become active causing acne.
- **Muscles** :
Increase in muscles takes place which gives shape to shoulders, arms and legs.
- **Voice** :
Voice becomes shrill and voice breaks are rare among girls.





UNIT TEST – 6

REACHING THE AGE OF ADOLESCENCE

Time : 1.15 hrs

Marks: 25

I. Choose the correct answer.

5×1=5

1. Adolescence is the period of life between _____ years of age.
a) 10 to 16 b) 11 to 17
c) 13 to 19 d) 11 to 20
2. During puberty, the region below the waist become wider in _____.
a) boys b) girls
c) both a and b d) none of these
3. Adam's apple is the growth of the _____.
a) pharynx b) thyroid
c) larynx d) parathyroid
4. _____ are the chemical substances, secreted by endocrine gland.
a) Hormones b) Enzymes
c) Proteins d) Fatty acids
5. Hormone involved in the contraction of smooth muscles of uterus during second stage of labour which helps delivery of foetus is _____.
a) testosterone b) androgens
c) estrogens d) oxytocin

II. Fill in the blanks.

5×1=5

6. _____ is secreted by the ovaries of female.
7. Milk secretion during lactation is controlled by the hormone _____.
8. The male and the female gamete fuse together and form _____.
9. _____ helps to prevent thyroid gland related diseases.
10. After ovulation the ovum reaches the _____.

III. Write short answer for the following questions.

5×2=10

11. What is adolescents?
12. Explain Menarche.
13. How is adolescence differ from childhood?
14. What is fertilization?
15. Define Gynecologist.

III. Answer in detail.

1×5=5

16. What are the physical changes that occur during adolescence in boys and girls?

(OR)

Briefly describe the menstrual cycle.



7

Digital Painting

TEXT BOOK EXERCISES

1. Tux paint software is used to _____.

- a) paint b) program
c) scan d) PDF

[Ans: a) paint]

2. Which tool bar is used for drawing and editing controls in tux paint software?

- a) Left Side: Tool bar
b) Right side : Tool bar
c) Middle : Tool bar
d) Bottom : Tool bar

[Ans: a) Left Side : Toolbar]

3. What is the short cut key for undo option?

- a) Ctrl + Z b) Ctrl + R
c) Ctrl + Y d) Ctrl + N

[Ans: a) Ctrl + Z]

4. Tux Math software helps in learning the _____.

- a) painting b) arithmetic
c) programming d) graphics

[Ans: b) arithmetic]

5. In Tux Math, Space cadet option is used for _____.

- a) simple addition b) division
c) drawing d) multiplication

[Ans: a) simple addition]

II. Answer in briefly.

1. What is Tux Paint ?

- Tux Paint is a free drawing program designed for young children.
- It has a simple, easy-to-use interface, fun sound effects, and an encouraging cartoon mascot which helps to guide children as they use the program.

2. What is the use of Text Tool ?

Text Tool tool is used to type texts.

3. What is the Shortcut key for Save option?

Shortcut key for ' Save' option is Ctrl + S.



**4. What is Tux Math?**

- Tux Math is an open source arcade – style video game for learning arithmetic.
- The main goal is to make learning effective and fun.

5. What is the use of Ranger?

Ranger is an option used in Tux Math for addition, subtraction, multiplication and division to ten.

ADDITIONAL QUESTIONS

I. Choose the best answer.**1. The largest part of the screen dedicated to draw and edit images.**

- | | |
|----------------------------|--------------------------|
| a) Middle : Drawing Canvas | b) Bottom : Help Area |
| c) Left Side : Toolbar | d) Right Side : Selector |

[Ans: a) Middle : Drawing Canvas]

2. The Linux Penguin, provides tips and other information while you draw, is located in _____.

- | | |
|----------------------------|--------------------------|
| a) Middle : Drawing Canvas | b) Bottom : Help Area |
| c) Left Side : Toolbar | d) Right Side : Selector |

[Ans: b) Bottom : Help Area]

3. Shortcut key for Redo is _____.

- | | |
|-------------|-------------|
| a) Ctrl + Z | b) Ctrl + Y |
| c) Ctrl + N | d) Ctrl + O |

[Ans: b) Ctrl + Y]

II. Match the following.

Tool Name		Keyboard Shortcut Key
1. New	-	a) Ctrl + O
2. Open	-	b) Ctrl + P
3. Save	-	c) Ctrl + Y
4. Print	-	d) Ctrl + S
5. Quit	-	e) Ctrl + N
6. Undo	-	f) Esc
7. Redo	-	g) Ctrl + Z

[Ans: 1.e 2.a 3.d 4.b 5.f 6.g 7.c]

II. Answer in briefly.**1. Name the Tools of Tux Paint.**

- | | |
|---|--|
| <ul style="list-style-type: none"> • The Paint Brush tool - Eraser • The Stamp tool - Undo • Left and Right arrows - Redo • Lines - New | <ul style="list-style-type: none"> • Shapes tool - Open • Text tool - Save • Magic tool - Print |
|---|--|





UNIT TEST – 7

Digital Painting

Time : 1.15 hrs

Marks: 25

I. Choose the correct answer.

5×1=5

1. Tux paint software is used to _____.

- a) paint b) program c) scan d) PDF

2. Which tool bar is used for drawing and editing controls in tux paint software?

- a) Left Side : Toolbar b) Right side : Toolbar
c) Middle : Tool bar d) Bottom : Tool bar

3. What is the short cut key for undo option?

- a) Ctrl + Z b) Ctrl + R c) Ctrl + Y d) Ctrl + N

4. In Tux Math, Space cadet option is used for _____.

- a) simple addition b) division c) drawing d) multiplication

5. Shortcut key for Redo is

- a) Ctrl + Z b) Ctrl + Y c) Ctrl + N d) Ctrl + O

II. Match the following.

5×1=5

Tool Name

Keyboard Shortcut Key

- | | | |
|----------|---|----------|
| 6. New | - | Ctrl + O |
| 7. Open | - | Ctrl + P |
| 8. Undo | - | Ctrl + Y |
| 9. Print | - | Ctrl + Z |
| 10. Redo | - | Ctrl + N |

II. Write short answer for the following questions.

5×2=10

11. What is Tux Paint?
12. What is the use of Text Tool?
13. What is the Shortcut key for Save option?
14. What is Tux Math?
15. What is the use of Ranger?

III. Answer in detail.

1×5=5

16. Name the Tools of Tux Paint.



MODEL QUESTION PAPER - SECOND TERM**SUMMATIVE ASSESSMENT****SCIENCE**

Time : 2 hrs

Marks: 60

PART – A**I. Choose the correct answer.**

10×1=10

1. Heat is a form of _____.

- a) electrical energy b) gravitational energy c) thermal energy d) None of these

2. The electrification of two different bodies on rubbing is because of the transfer of

- a) neutrons b) protons
c) electrons d) protons and neutrons

3. An electroscope has been charged by induction with the help of charged glass rod. The charge on the electroscope is

- a) negative b) positive
c) both positive and negative d) none of the above

4. Aerated water contains

- a) air b) oxygen c) carbon dioxide d) nitrogen

5. Cathode rays are made up of

- a) neutral particles b) positively charged particles
c) negatively charged particles d) none of the above

6. _____ joints is immovable?

- a) Shoulder and arm b) Knee and joint
c) Upper jaw and skull d) Lower jaw and upper jaw

7. _____ of one of the following categories of vertebrae are correctly numbered.

- a) Cervical – 7 b) Thoracic – 10 c) Lumbar – 4 d) Sacral – 4E

8. The period at which the organism attain sexual maturity is called _____.

- a) puberty b) adolescence c) growth d) maturity

9. Androgen production is regulated by _____.

- a) GH hormone b) LH hormone c) TSH hormone d) ACTH hormone

10. What is the short cut key for undo option?

- a) Ctrl + Z b) Ctrl + R c) Ctrl + Y d) Ctrl + N

II. Fill in the blanks.

5×1=5

11. The process of converting a substance from gas to solid is called _____.
12. The process of conversion of iron into hydrated form of oxides is called _____.
13. _____ is a negatively charged particle (Electron/Proton).

14. The place where two bones meet is termed as _____.
15. Tux Math software helps in learning the _____.

PART – B**III. Write short answer for the following questions (any 15).**

15×2=30

16. What are the effects of heat?
17. Write about convection.
18. The heat capacity of the vessel of mass 100 kg is 8000 J/°C. Find its specific heat capacity.
19. How charges are produced by friction?
20. What is electroplating?
21. What are the sources of oxygen?
22. List out the uses of nitrogen.
23. What is global warming?
24. Write the properties of anode rays.
25. What is a chemical equation?
26. Define the term ions or radicals.
27. Differentiate tendons and ligament.
28. What are antagonistic muscles? Give one example.
29. What is ligament?
30. Explain the process of pregnancy.
31. How is adolescence differ from childhood?
32. Explain Menarche.
33. What is Tux Paint ?
34. What is the Shortcut key for Save option?
35. What is Tux Math?

PART – C**III. Answer in detail. (Select each one from each part)**

3×5=15

36. Explain the working of thermos flask. **(OR)**
Explain series and parallel circuit.
37. What are the effects of acid rain? How can we prevent them? **(OR)**
Write the skeleton equation for the following word equation and then balance them.
 - a) Carbon + Oxygen → Carbon di oxide
 - b) Phosphorus + Chloride → Phosphorus pentachloride.
 - c) Sulphur + Oxygen → Sulphur di oxide
 - d) Magnesium + hydrogen chloride → Magnesium chloride + Hydrogen
38. Name the different types of joints? Give one example for each type. **(OR)**
Briefly describe the menstrual cycle.

