



ZOOLOGY

Higher Secondary - First year

PRACTICAL

Zoology Practical - General Instruction

In order to get maximum benefit and good training it is necessary for the students to follow the following instructions.

1. The students must attend all practical classes. Each experiment in practicals has got important relevance to theory subjects.
2. Bring this practical manual to your practicals class.
3. Bring the following objects to the practicals class – Pencils (HB), Pen, Eraser, a scale and a small hand towel.
4. Record the title, date and findings of the experiment in the observation note book.
5. Carefully listen to the instructions given by your Teacher.
6. While observation slides or models draw the structure of the specimen as you see it neatly in your observation note book. Use pencil for drawing.
7. While doing experiments neither consult your neighbours nor look into their readings or observations.
8. If the object under the microscope remains without proper focusing immediately bring it to the notice of the Teacher.
9. Do not touch or lift the models or equipments kept for your identification.
10. **No need to draw diagrams from part III to VIII in the record note. Relevant photograph can be collected, pasted and notes to be written.**

MODEL QUESTION

CLASS: 11

TIME: 2½hours

Marks: 15

- I. Identify the given animal 'A' (picture/specimen) draw and write any 2 diagnostic features. (2)
- II. Identify the given animal tissue 'B' (slide/photograph /picture) and write any 2 comments with diagram (2)
- III. Identify and comment on the given bone/joint 'C'. (1½)
- IV. Identify the deficiency disease / disorder in the given picture/photograph "D". Write any three symptoms. (2)
- V. Identify the medical instrument "E" and write any three significant points. (2)
- VI. Identify the given sample solution 'F' for the presence/activity of Ammonia/Urea/Salivary amylase (Any one). (3)
- VII. Observe and write about the given experiment / specimen / picture 'G'. (1)
- VIII. Identify the photograph / picture and write its economic importance '(H)' (1½)

MARKS ALLOTMENT

MARKS 15

- | | | |
|-------|---|------|
| I. | Identification – $\frac{1}{2}$; Diagram - $\frac{1}{2}$;
Diagnostic features (any 2 points) -1 | (2) |
| II. | Identification – $\frac{1}{2}$; Comments (any 2 points) – 1
Diagram - $\frac{1}{2}$ | (2) |
| III. | Identification – $\frac{1}{2}$; Comments – 1 (any two points) | (1½) |
| IV. | Identification – $\frac{1}{2}$; Symptoms – 1½ (any three points) | (2) |
| V. | Identification - $\frac{1}{2}$; Significance - 1½ (any three points) | (2) |
| VI. | Procedure – 1; Experiment- 1 ; Result - 1 | (3) |
| VII. | Procedure and Result | (1) |
| VIII. | Identification – $\frac{1}{2}$,;Economic importance – 1 (any two points) | (1½) |

NOTE: Any relevant points, diagnostic features and comments apart from those provided in the practical manual must also be considered for evaluation.

CONTENT

QUESTION NO-I (A)		
S.No	List of Slides/Specimens	Page No
1	Spongilla	1
2	Sea Anemone	1
3	Tapeworm	2
4	Ascaris	3
5	Earthworm	3
6	Cockroach	4
7	Pila	5
8	Starfish	5
9	Balanoglossus	6
10	Amphioxus	7
11	Ascidia	7
12	Shark	8
13	Seahorse	9
14	Frog	10
15	Calotes	10
16	Pigeon	11
17	Rat	12
QUESTION NO-II (B)		
S.No	List of Slides/Pictures/Photograph	Page no
1	Squamous Epithelium	13
2	Columnar Epithelium	13
3	Cardiac Muscles	14
4	Smooth Muscles	14
5	Adipose Tissue	15

6	RBC	15
7	WBC	16
QUESTION NO-III (C)		
S.No	List of model/picture/photograph (Human)	Page no
1	Humerus	17
2	Pectoral girdle	17
3	Pelvic girdle	18
4	Part of the Skull (Occipital, Frontal, Temporal, Parietal)	18
5	Rib cage (True ribs, Pseudo ribs, False ribs)	19
6	Ball and Socket joint	19
7	Pivot joint	20
QUESTION NO-IV (D)		
S.No	List of Slides/Pictures/Photograph	Page no
1	Addison's disease	21
2	Gigantism	21
3	Marasmus	22
4	Rickets	22
5	Exophthalmic Goitre	23
QUESTION NO-V (E)		
S.No	Medical Instruments	Page no
1	Sphygmomanometer	24
2	Stethoscope	24
3	Glucometer	25
4	ECG	25
5	CT Scan	26
6	Ultrasonography	26

QUESTION NO-VI (F)

S.No	List of Experiments	Page no
1	Test for Ammonia	27
2	Test for Urea	27
3	Test for Salivary Amylase	27

QUESTION NO-VII (G)

S.No	List of Experiments	Page no
1	Determine Your Eye Dominance	28
2	Determine Your Blind Spot	28
3	Identify the sex of cockroach (using hand lens)	29
4	Clitellum of earthworm (using hand lens)	29

QUESTION NO-VIII (H)

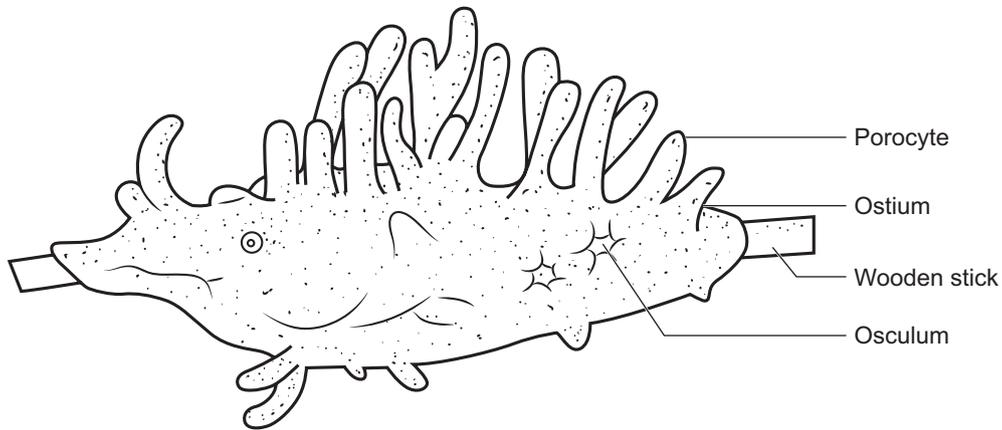
S.No	List of photograph/pictures	Page no
1	Kangayam bull	30
2	Aquaponics	30
3	Honey bee	31
4	Bombyx mori	31

I. Identify the given animal 'A' (picture/specimen) and write any 2 diagnostic features with diagram.

1. SPONGILLA

Identification:

The given specimen is identified as *Spongilla*. It belongs to the Phylum **Porifera**.



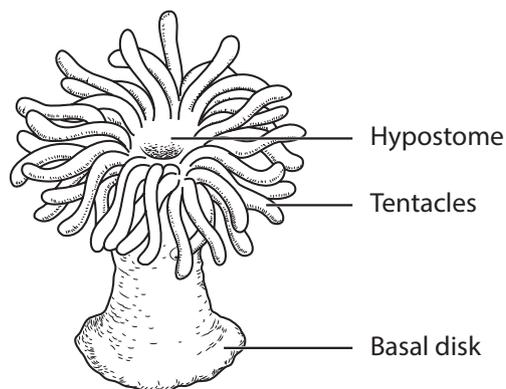
Reasons for identification:

- It is a pore bearing animal.
- It is an aquatic multicellular animals with cellular level of organization.
- It possess a canal system where the water enters into the central cavity, spongocoel through minute pores called ostia.
- The spongocoel is lined with special flagellated cells called choanocytes.

2. SEA ANEMONE

Identification:

The given specimen is identified as **Sea anemone**. It belongs to the Phylum **Cnidaria**.



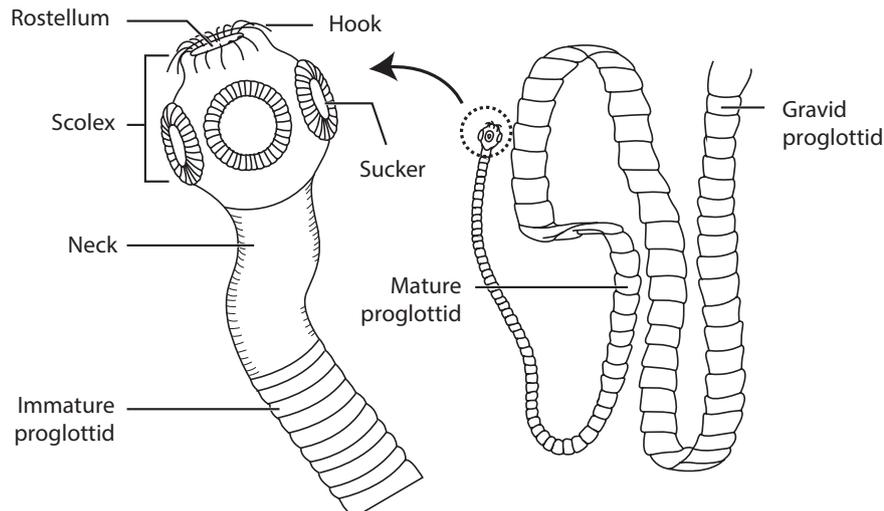
Reasons for identification:

- Sea anemone is diploblastic and the first group of animals to exhibit tissue level of organization.
- It has stinging cells called nematocysts on their tentacles.
- The central vascular cavity is called coelenteron which opens out through the hypostome.
- The nervous system is formed of a diffused nerve net.
- Cnidarians exhibit 2 basic body forms, polyp and medusa.
- The polyp represents the asexual generation and the medusa represents the sexual generation (Alternation of generation).
- Development includes a ciliated Planula larva.

3. TAPEWORM

Identification:

The given specimen is identified as **Tapeworm**. It belongs to the Phylum **Platyhelminthes**.



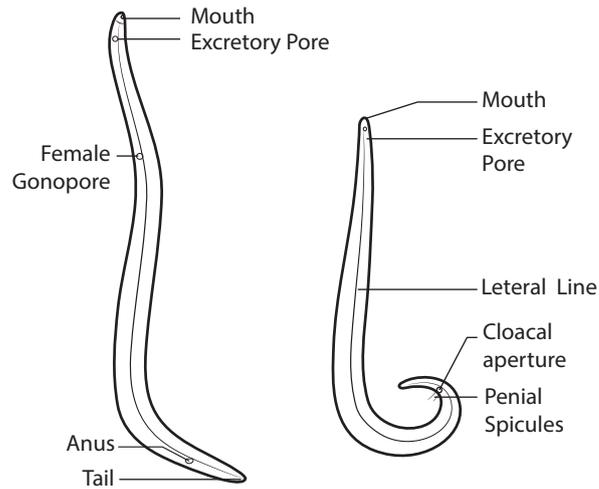
Reasons for identification:

- It is a dorsoventrally flattened, triploblastic, acoelomate animal with organ level of organization.
- It is an endoparasites.
- Hooks and Suckers act as organs of attachment.
- Excretion is carried out by specialized cells called flame cells.

4. ASCARIS

Identification:

The given specimen is identified as *Ascaris*. It belongs to the Phylum **Aschelminthes**.



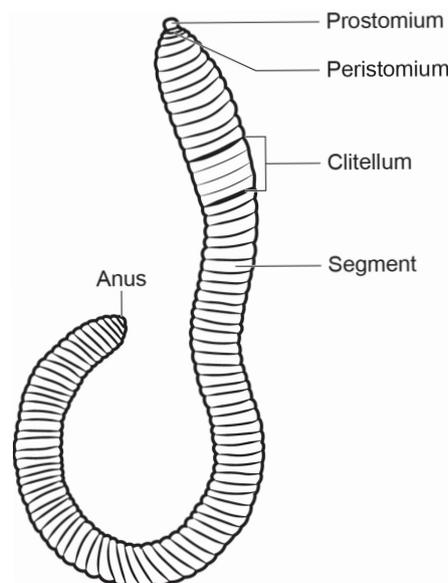
Reasons for identification:

- *Ascaris* is a roundworm because it is circular in cross section.
- It is a triploblastic, pseudocoelomate animal.
- The unsegmented body is covered by a protective layer called cuticle.
- Alimentary canal is complete with a well developed mouth, pharynx and anus cloaca.
- Sexes are separate and exhibit sexual dimorphism.
- Excretion is carried out through Rennet glands.
- It is an endoparasite.

5. EARTHWORM

Identification:

The given specimen is identified as **Earthworm**. It belongs to the Phylum **Annelida**.



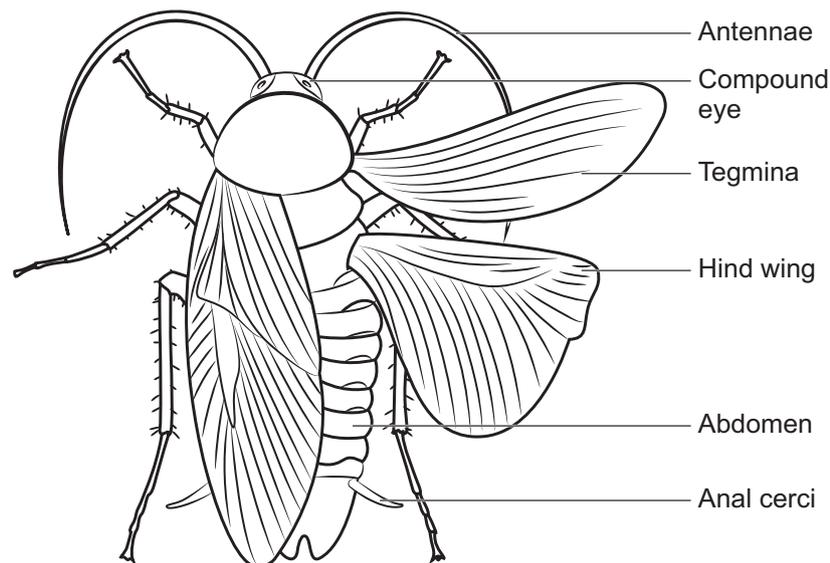
Reasons for identification:

- Earthworm is a triploblastic, schizocoelomate animal.
- Its elongated body is segmented.
- The longitudinal and circular muscles in the body wall help in locomotion.
- The circulatory system is of closed type and the respiratory pigment haemoglobin is present in the plasma.
- It is a hermaphrodite animal.

6. COCKROACH

Identification:

The given specimen is identified as **Cockroach**. It belongs to the Phylum **Arthropoda**.



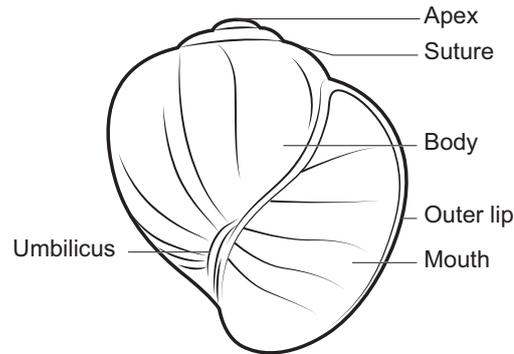
Reasons for identification:

- It is a triploblastic, schizocoelomate animal.
- It has jointed appendages which are used for locomotion.
- Body is covered by a chitinous exoskeleton which is shed off periodically by a process called moulting/ecdysis.
- Respiration is through trachea.
- Excretion is by malpighian tubules.

7. PILA

Identification:

The given specimen is identified as *Pila*. It belongs to the Phylum **Mollusca**.



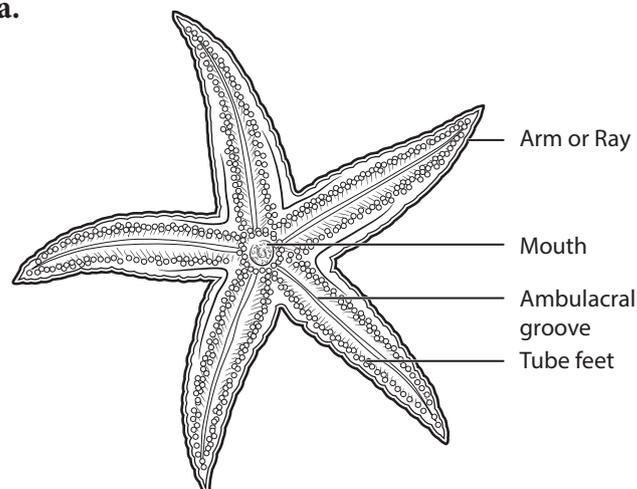
Reasons for identification:

- It is a triploblastic, coelomate animal.
- Body is covered by a calcareous shell.
- Internal organs are covered by a soft layer of skin called mantle.
- Respiration is carried out through a number of feather like gills called ctenidia.
- The mouth contains a rasping organ called radula.
- Excretory organs are the nephridia.
- Blood contains a copper containing respiratory pigment, haemocyanin.
- Their development includes a Veliger larva.

8. STARFISH

Identification:

The given specimen is identified as **Starfish**. It belongs to the Phylum **Echinodermata**.



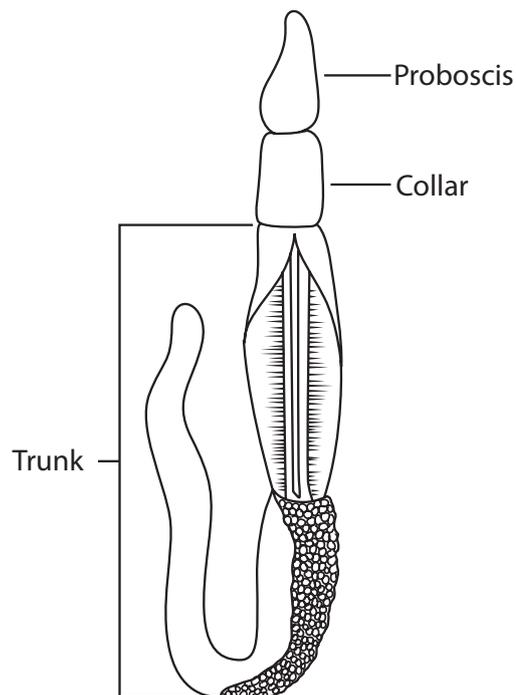
Reasons for identification:

- It has spiny skin.
- It has Water vascular system.
- Tube feet help in locomotion.
- The adults are radially symmetrical.
- Larvae are bilaterally symmetrical
- Circulatory system is open type without heart and blood vessels.
- It exhibits autotomy with remarkable power of regeneration.
- Bipinnaria is the first larva in its development.

9. BALANOGLOSSUS

Identification:

The given specimen is identified as *Balanoglossus*. It belongs to the Phylum **Hemichordata**.



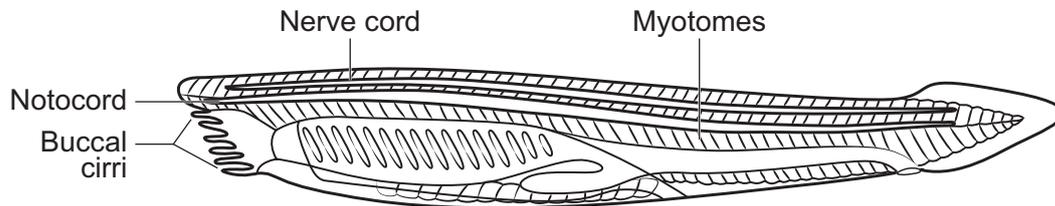
Reasons for identification:

- It is a connecting link between invertebrates and chordates.
- The body is divided into anterior proboscis, a short collar and a long trunk.
- It is a marine and bilaterally symmetrical animal.
- Excretion is by a single proboscis gland.
- Development is indirect with a free swimming Tornaria larva.
- Presence of buccal diverticulum is the significant character of this animal.

10. AMPHIOXUS

Identification:

The given specimen is identified as **Amphioxus**. It belongs to the Sub phylum Cephalochordata.



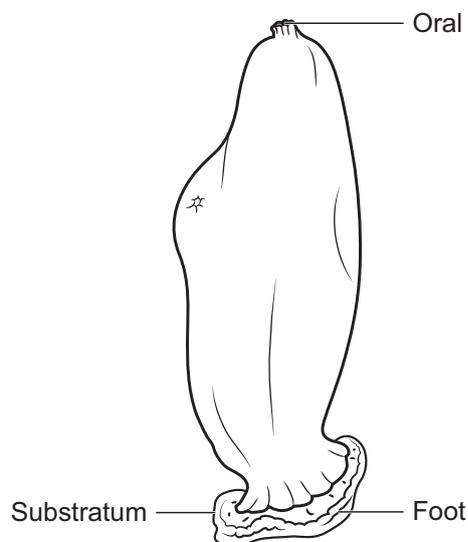
Reasons for identification:

- Amphioxus is a marine animal, found in shallow waters, leading a burrowing mode of life.
- Chordate characters such as notochord, dorsal tabular nerve cord and pharyngeal gill slits are present throughout their life.
- Closed type of circulatory system is seen without heart.
- Excretion by protonephridia.
- Sexes are separate, fertilization is external, development is indirect and includes a free swimming larva.

11. ASCIDIAN

Identification:

The given specimen is identified as **Ascidian**. It belongs to the **Subphylum Urochordata**.



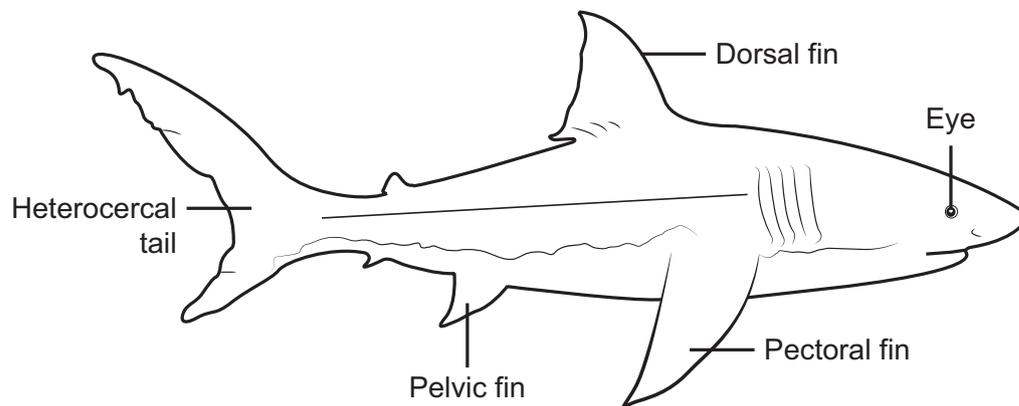
Reasons for identification:

- It is exclusively marine.
- Body is covered by a tunic/test.
- Notochord is present only in the tail region of the larval stage. Hence named urochordata.
- Dorsal tubular nerve cord is present only in the larval stage.
- Mostly hermaphrodites and development is indirect with a free swimming tadpole larva.
- Retrogressive metamorphosis is seen in Ascidian.

12. SHARK

Identification:

The given specimen is identified as **Shark**. It belongs to the Phylum **Chordata**, Sub phylum **Vertebrata** and Class **Chondrichthyes**.



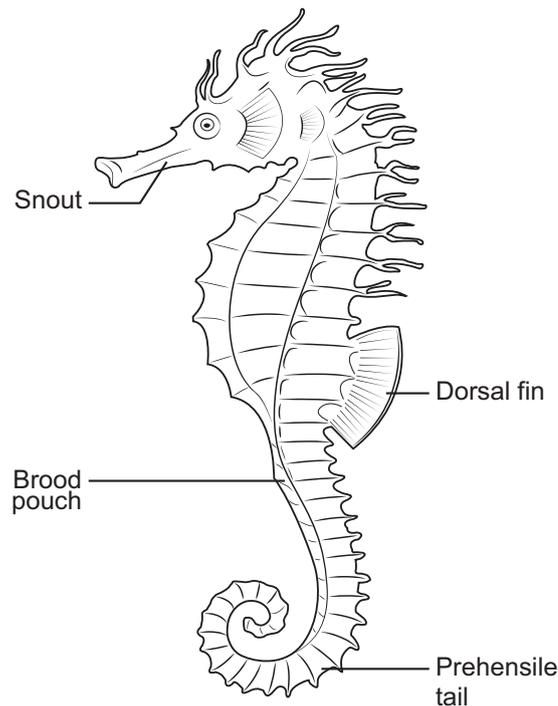
Reasons for identification:

- It is a marine fish with cartilaginous endoskeleton.
- Skin is tough and covered by placoid scales.
- Caudal fin is heterocercal.
- Respiration is by gill slits without operculum.
- Excretory organs are mesonephric kidneys.
- It is a poikilothermic animal.

13. SEA HORSE

Identification:

The given specimen is identified as **Sea horse**. It belongs to the Phylum **Chordata** and Sub phylum **Vertebrata** and Class **Osteichthyes**.



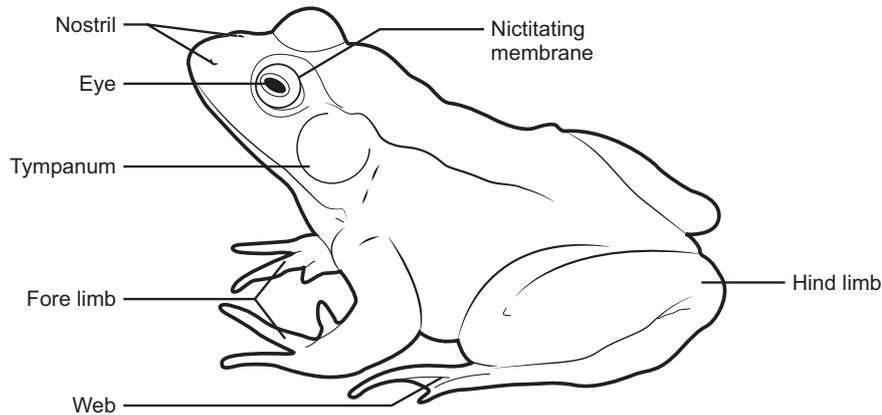
Reasons for identification:

- Seahorse is mainly found in shallow tropical seas.
- It is a bony fish which do not have scales but rather its skin is stretched over a series of bony plates.
- It swims upright propelling itself by using a dorsal fin.
- It has a prehensile tail to hold the object.
- When mating, the female seahorse deposits eggs in the male's brood pouch. Further development occurs in the male seahorse.
- Seahorse populations are thought to be endangered as a result of overfishing and habitat destruction.

14. FROG

Identification:

The given specimen is identified as **Frog**. It belongs to the Phylum Chordata, Subphylum Vertebrata and Class **Amphibia**.



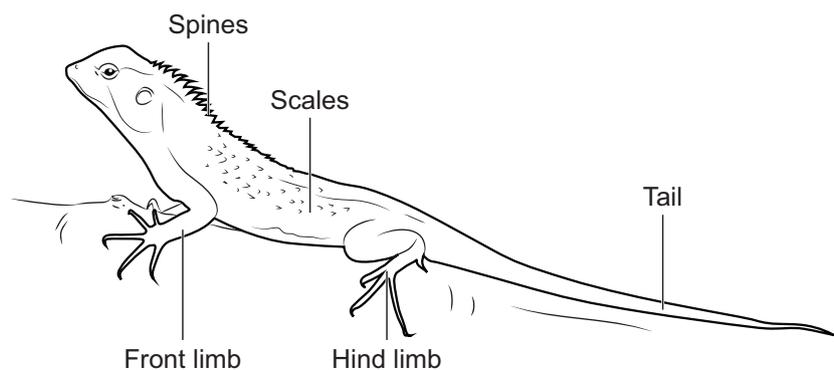
Reasons for identification:

- It is commonly found in fresh water ponds, pools and moist surfaces. It is adapted to live both on land and in water.
- Amphibians are poikilothermic.
- Heart is three chambered.
- Sinus venosus, a large triangular chamber, is present on the dorsal side of the heart.
- Sexes are separate and fertilization is external.
- Development is indirect with a tadpole stage.

15. CALOTES

Identification:

The given specimen is identified as **Calotes**. It belongs to the Phylum Chordata, Subphylum Vertebrata and Class **Reptilia**.



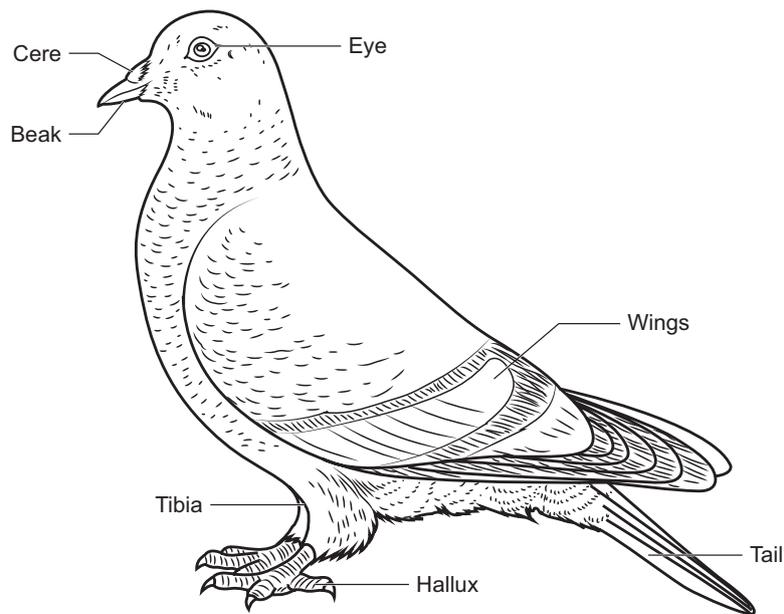
Reasons for identification:

- It is a terrestrial, poikilothermic animal.
- Body is covered with dry horny scales.
- Heart is 3 chambered.
- Excretion is by metanephric kidneys and is uricotelic.
- It is monoecious.
- Fertilization is internal.
- It is oviparous and lays cleidoic eggs.

16. PIGEON

Identification:

The given specimen is identified as **Pigeon**. It belongs to the Phylum Chordata, Sub phylum Vertebrata and Class **Aves**.



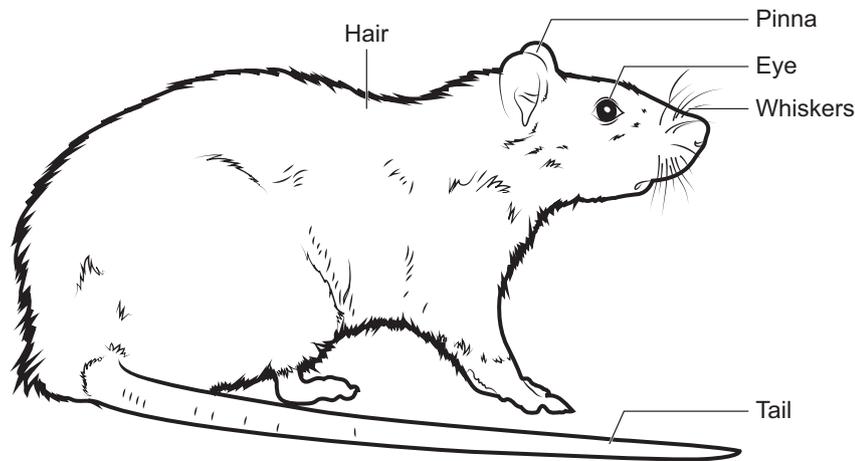
Reasons for identification:

- It is a feathered, bipedal flying vertebrate.
- Its skin is dry and without glands except the preen gland.
- Endoskeleton is ossified and the long bones are pneumatic.
- Flight muscles are well developed.
- Heart is four chambered.
- Urinary bladder is absent.
- Fertilization is internal.
- Presence of Quill feathers on wings and tail.

17. RAT

Identification:

The specimen kept for identification is the **Rat**. It belongs to the Phylum Chordata , Subphylum Vertebrata and Class **Mammalia**.



Reasons for identification:

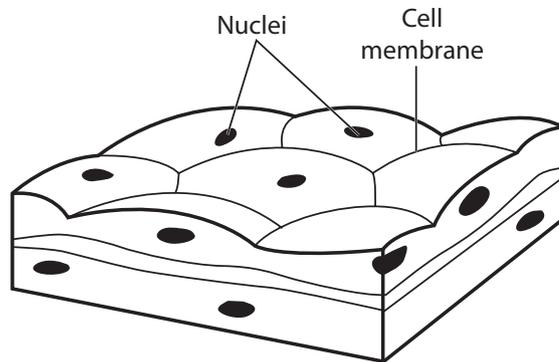
- Presence of mammary gland is the unique feature of mammals.
- It has 2 pairs of limbs.
- Pair of pinnae or external ears are present.
- Heart is 4 chambered.
- Kidneys are metanephric and are ureotelic animal
- Rats are homeothermic and viviparous.

II. Identify the given animal tissue 'B' (slide/photograph/picture) and give any 2 comments with diagram.

1. SQUAMOUS EPITHELIUM

Identification

The given slide/picture is identified as **squamous epithelium**.



Notes:

- Squamous epithelium is a type of simple epithelium
- It is made of a single thin layer of flattened cells with irregular boundaries.
- Found in cheek, kidney glomeruli, air sacs of lungs, lining of heart and blood vessels.
- It is involved in diffusion and filtration.

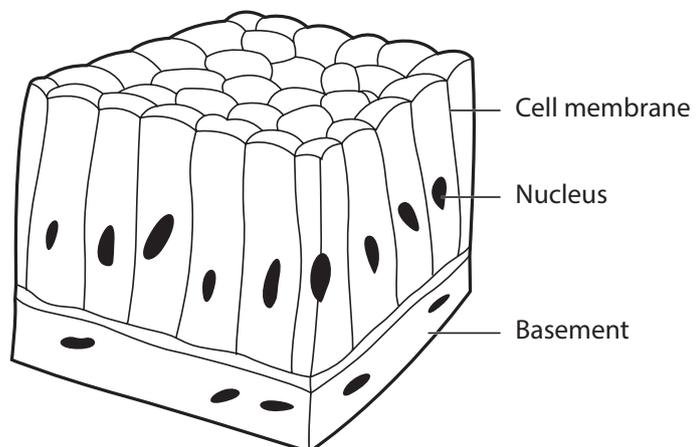
2. COLUMNAR EPITHELIUM

Identification:

The given slide/ picture is identified as **columnar epithelium**

Notes:

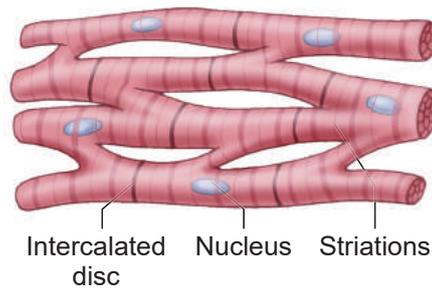
- Columnar epithelium is a type of simple epithelium.
- It is composed of a single layer of tall cells with round oval nuclei at the base.
- It lines the digestive tract from the stomach to rectum.
- It is involved in absorption, secretion of mucus, enzymes and other substances.



3. CARDIAC MUSCLE

Identification:

The given slide / picture is identified as **cardiac muscle**.



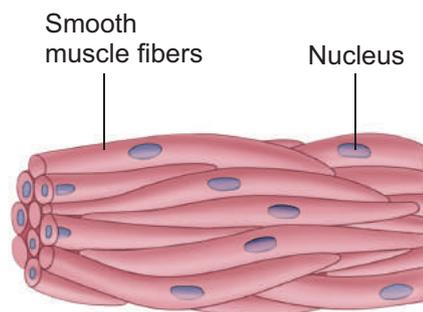
Notes:

- This contractile tissue is present in the heart.
- It is striated and involuntary in function.
- Cell junctions fuse the plasma membranes of cardiac muscle cells.
- Communication junctions (intercalated discs) at some fusion points allow the cells to contract as a unit.

4. SMOOTH MUSCLE

Identification:

The given slide / picture is identified as **smooth muscle**.



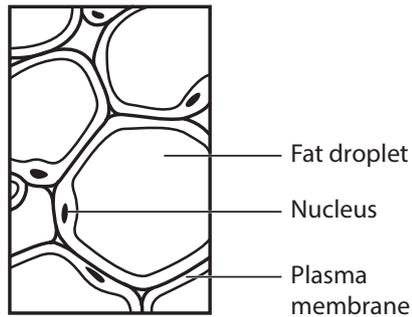
Notes:

- The smooth muscle fibers taper at both ends.
- They do not show striations.
- Cell junctions hold them together and are bundled together in a connective tissue sheath.
- Smooth muscles are present in blood vessels, stomach and intestine.

5. ADIPOSE TISSUE

Identification:

The given slide / picture is identified as **Adipose tissue**.



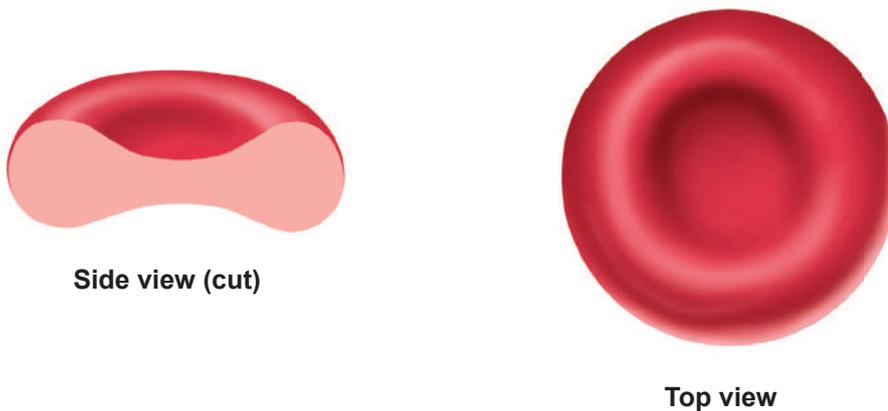
Notes:

- Adipose tissue is located beneath the skin.
- The cells of this tissue store fat and excess nutrients.
- Adipose tissue which contains abundant mitochondria is called brown fat.
- Brown fat produces heat by non-shivering thermogenesis in babies.

6. RBC

Identification:

The given slide is identified as **Red blood corpuscles (Erythrocytes)**.



Notes:

- The red colour of the RBC is due to the presence of a respiratory pigment, haemoglobin.
- Haemoglobin plays an important role in the transport of respiratory gases.
- RBC's are produced in the red bone marrow of large bones and are destroyed in the spleen and liver.
- The average life span of an RBC in a healthy individual is about 120 days.

7. WBC

Identification:

The given slide is identified as **white blood corpuscles (leucocytes)**.



Eosinophils



Basophils



Neutrophils



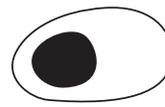
Monocytes



Lymphocytes



Macrophages



Plasma cells

Notes:

- Leucocytes are colourless, amoeboid, nucleated cells devoid of haemoglobin and other pigments.
- Based on the presence (or) absence of granules, WBC's are divided into two types, granulocytes (Neutrophil, Basophil and Eosinophil) and agranulocytes (Lymphocyte and Monocyte).
- WBCs are involved in protecting the body against pathogens.
- The life span of a white blood cell ranges from 13 to 20 days. These are destroyed in the lymphatic system.

III. Identify and comment on the given bone/joint 'C'.

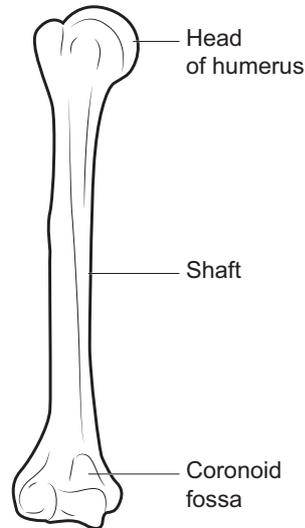
1. HUMERUS BONE

Identification:

The given specimen/picture kept for identification is the **human – humerus bone**.

Comments:

- It is found between the shoulder and elbow.
- The head of humerus articulates with the glenoid cavity of the pectoral girdle.
- The other end of the humerus articulates with the two forearm bones namely the radius and ulna.



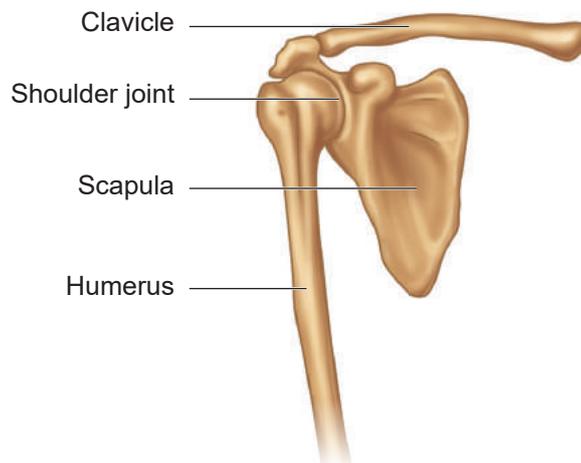
2. PECTORAL GIRDLE

Identification:

The given specimen kept for identification is the **human pectoral girdle**.

Comments:

- The upper limbs are attached to the pectoral girdles.
- The girdle is formed of two halves.
- Each half consists of a clavicle bone and a scapula
- The scapula is a large, thin triangular bone between the second and seventh ribs.
- The clavicle articulates with a flat expanded process called acromium.



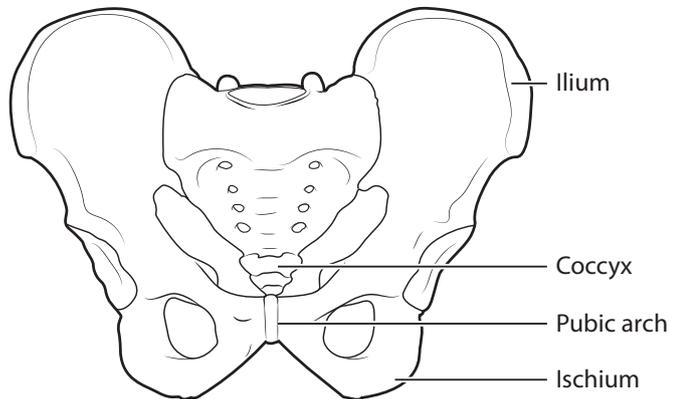
3. PELVIC GIRDLE

Identification:

The given specimen kept for identification is the **human pelvic girdle**.

Comments:

- It is composed of 2 hip bones called coxal bones together with the sacrum and coccyx.
- It is a heavy structure specialized for weight bearing.
- Each coxal bone consists of 3 fused bones namely the ilium, ischium and pubis.
- At the point of fusion of the 3 bones, a socket called acetabulum is present.
- The acetabulum is meant for the articulation of the lower limbs.



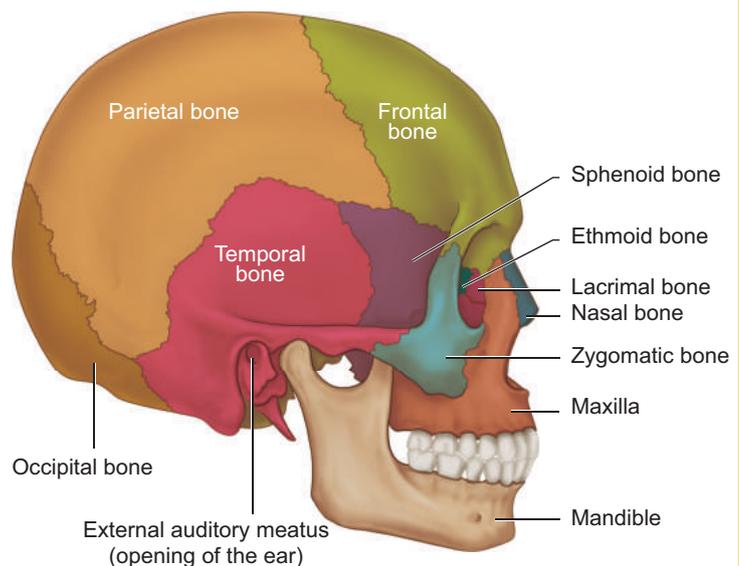
4. PART OF THE HUMAN SKULL

Identification:

The given specimen kept for identification is the **human skull**.

Comments:

- The skull is composed of two sets of bones – 8 cranial and 14 facial bones.
- The cranium consists of unpaired bones such as frontal, occipital and paired bones such as parietal and temporal.
- These bones are joined by immovable sutures.
- The facial bones are maxilla, zygomatic, palatine, lacrimal and nasal bones.
- Foramen magnum is the large opening found at the base of the skull.



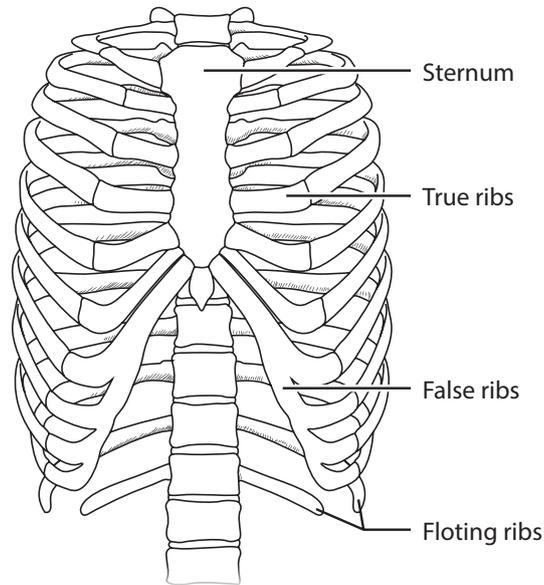
5. RIB CAGE

Identification:

The given specimen kept for identification is the **human ribcage**.

Comments:

- There are 12 pairs of ribs.
- Each rib is connected dorsally to the vertebral column and ventrally to the sternum.
- The first 7 pairs of ribs are called true ribs.
- The 8th, 9th and 10th pairs of ribs do not articulate with the sternum but is joined with the 7th rib. They are called as false ribs.
- The last 11th and 12th pairs of ribs are not connected with sternum. They are called as floating ribs.



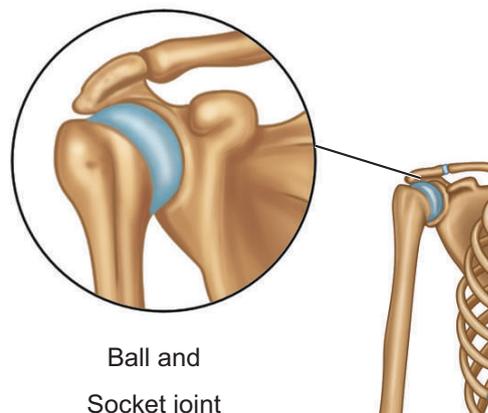
6. BALL AND SOCKET JOINT

Identification:

The specimen/model/picture kept for identification is the **Ball and Socket joint**.

Comments:

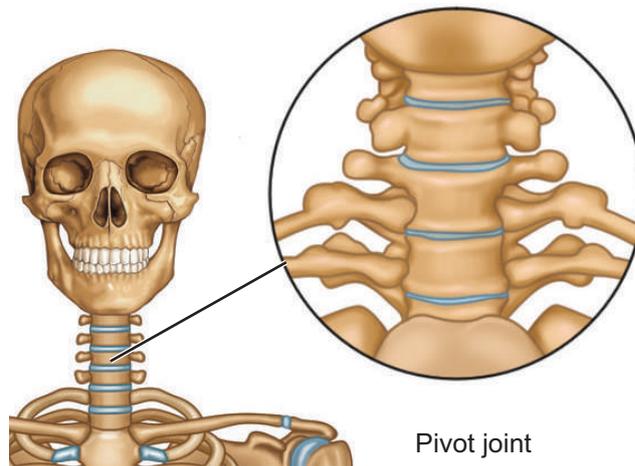
- It is a type of synovial joint.
- In this type, the ball shaped rounded bone fits into the cup like depression of another bone.
- It allows multi directional movements and rotation.
- This type of joints are found between the upper arm and shoulder and between the upper leg and hip.



7. PIVOT JOINT:

Identification:

The given specimen kept for identification is the **human pivot joint**.



Comments:

- It is a type of synovial joint
- It is also called rotary joint as it allows only rotary movement around a single axis.
- It lies between atlas and axis vertebrae.

IV. Identify the deficiency disease/disorder 'D' in the given picture/photograph and write any 3 symptoms.

1. ADDISON'S DISEASE

Identification:

The picture kept for identification depicts **Addison's disease**.

Comments:

- It is a disorder in which the adrenal glands do not produce enough hormones.
- It is caused due to hyposecretion of glucocorticoids and mineralocorticoids from the adrenal cortex.
- Muscular weakness, low BP, loss of appetite, vomiting, hyper pigmentation of the skin are the symptoms of Addison's disease.



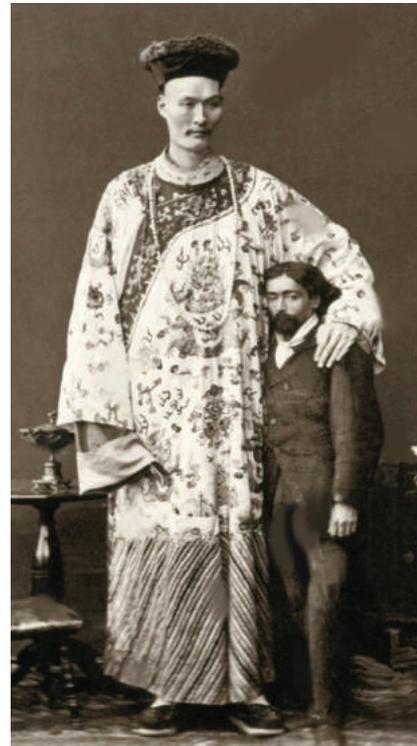
2. GIGANTISM

Identification:

The picture kept for identification depicts **Gigantism**.

Comments:

- It is a disorder due to hypersecretion of growth hormone in children.
- The growth hormone is secreted by the anterior pituitary.
- The affected children grow very tall even to the height of 8 feet (2.4m).



3. MARASMUS

Identification:

The picture kept for identification depicts **Marasmus**.

Comments:

- It is a disorder due to protein deficiency in children.
- It is an acute form of protein malnutrition.
- This is due to a diet with inadequate carbohydrate and protein.
- Diarrhoea and emaciation are the symptoms of this disease.



4. RICKETS

Identification:

The picture kept for identification depicts **Ricket's disease**.

Comments:

- In this case, mineralization of bones is defective.
- In India, it is a common problem in malnourished population.
- It is due to vitamin D deficiency.
- Bowed legs, knock-knees, pigeon chest broadening of wrist and ankles are the general symptoms.



5. EXOPHTHALMIC GOITRE

Identification:

The picture kept for identification depicts Exophthalmic goitre.



Comments:

- The hyper function of thyroid gland results in exophthalmic goitre/gravis disease.
- It is characterized by increased BMR (50% - 100%) with increased pulmonary ventilation and protrusion of eye balls from the sockets (exophthalmos)
- Elevated respiratory and excretory rate with increased body temperature are the general symptoms.

V. Identify the Medical instruments 'E' and write any 3 significance.

1. SPHYGMOMANOMETER:

Identification:

The medical apparatus kept for identification is the sphygmomanometer.

Significance:

- Sphygmomanometer is a device used to measure the blood pressure.
- Normal blood pressure is 120/80mmHg.
- 120 depicts the systolic pressure and 80 depicts the diastolic pressure.
- It helps to assess the state of blood circulation.
- Provides the functional details of heart.



2. STETHESCOPE:

Identification:

The medical instrument kept for identification is the stethoscope.

Significance:

- The stethoscope is used to hear the heart beat, sounds in the respiratory pathways, intestinal movements and also foetal movements.
- It helps to diagnose valve functions, lung diseases such as pneumonia, pleuritis and pulmonary oedema.
- Stethoscopes along with sphygmomanometer are used to measure blood pressure in humans.



3. GLUCOMETER

Identification:

The medical device kept for identification is the Glucometer.

Significance:

- It is a simple portable medical device used to record the approximate level of blood glucose.
- It displays the glucose level in mg/dL.
- It is a battery operated digital meter.
- Normal glucose value is 70-110mg/dL.



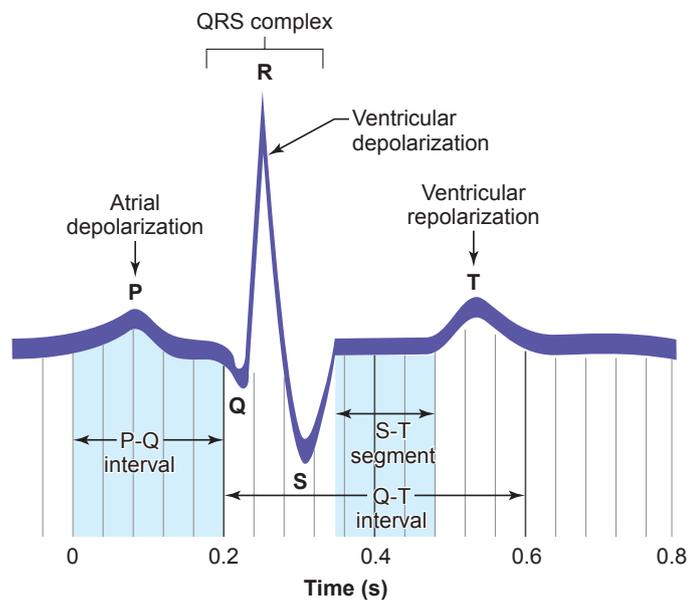
4. ECG GRAPH

Identification:

The picture kept for identification is an ECG graph.

Significance:

- An ECG records the electrical activities of the heart over a period of time.
- The special flap of muscle called the Sino auricular node in right atrium initiates the heart beat.
- The waves of the ECG are due to depolarization and not due to contraction of the heart.
- A normal ECG shows 3 waves designated as 'P' wave, 'QRS' complex and 'T' wave.



5. CT SCAN (Computed Tomographic Scanning)

Identification:

The picture kept for identification is CT scan.

Significance:

- It is used to generate a 3 dimensional image of the internal organs.
- Gives a clear image of bone, soft tissues and blood vessels.
- To detect cancer, heart and lung disorders.
- Helps to measure bone mineral density.
- To detect stroke causing clots and hemorrhage in the brain.



6. ULTRASONOGRAPHY

Identification:

The picture kept for identification is an ultrasonography.

Significance:

- Ultrasound waves are produced by a physical phenomenon known as piezo electric effect.
- Ultrasound waves are used to image the foetus at different stages of pregnancy to hear the foetal heart beat and blood flow.
- This is also used to diagnose tumors, gall stones, kidney stones and obstructions in the genital tracts.



VI. Identify the given sample solution 'F' for the presence/activity of salivary amylase/ ammonia/urea.

1. TEST FOR AMMONIA

Aim : To test the presence of Ammonia in the given solution.

Materials Required: Test tube and holder.

Solution Required: Sample solution and Nessler's Reagent.

Procedure:

- 1) Take 2ml of the given sample solution in a clean test tube.
- 2) Add few drops of Nessler's reagent in the test tube containing sample solution.
- 3) Appearance of dark yellow/brown colour confirms the presence of Ammonia in the given sample.

Inference: It is inferred that ammonia is present in the given solution.

2. TEST FOR UREA

Aim: To test the presence of urea in the given sample solution.

Material Required: Test tube, sample solution, test tube holder and pipette / dropper.

Required Reagents: Phenol red and Horse gram powder (which contains the enzyme urease).

Procedure:

1. Take 2 ml of sample solution in a clean test tube.
2. Add few drops of phenol red in the test tube containing sample solution.
3. Add a pinch of horse gram powder in the test tube and mix well.
4. Appearance of dark pinkish colour indicates the presence of urea in the given sample.

Inference: It is confirmed that the given sample solution contains urea.

3. TEST FOR SALIVARY AMYLASE

Aim: To test the presence of Amylase enzyme in the human saliva.

Materials Required: Test tubes, Potato, Mortar and Pestle.

Solutions Required: Iodine solution, Human Saliva.

Procedure:

- 1) Add mashed potato pieces in a test tube and add warm water. Shake well.
- 2) Collect the clear supernatant in a test tube.
- 3) Add few drops of iodine solution to the liquid in the test tube.

- 4) Note the bluish black (dark blue) colour in the test tube.
- 5) Collect a few drops of saliva in a clean test tube.
- 6) Transfer the saliva into the test tube containing the sample solution and shake well.
- 7) Leave the sample undisturbed for 5 minutes. Observe the colour change in the sample solution.
- 8) The solution gradually becomes colourless.
- 9) This confirms the presence of amylase in the human saliva.

Inference: It is inferred that human saliva contains the enzyme amylase that digests the starch.

VII. Observe and write about the given 'G' experiment / specimen / picture.

1. DETERMINE EYE DOMINANCE:

We're all familiar with preferences for using a particular hand for jobs such as writing and throwing. Eye dominance is important for how we see and react to the world around us.

Procedure:

1. With both eyes open carefully focus on an object a few feet away.
2. Close one eye, and then reopen it.
3. Close the other eye, and then reopen it. Which eye seems more directly in line with the object?
 - a. If it is the right eye, you are right eye dominant.
 - b. If it is the left eye, you are left eye dominant.
 - c. If it is the middle of both eyes, you are central eye dominant.

2. DETERMINE YOUR BLIND SPOT:



Procedure:

1. Cover your left eye.
2. Hold the figure shown about 50 to 60 cm away from your face and directly in front of your right eye.

3. Stare at the cross in the shown figure. You can also see the circle.
4. Continue to stare and slowly bring the figure nearer to your eye.
5. Note the point at which the circle will seem to disappear. This is your blind spot.
6. Record the distance.
7. Test your other eye in a similar manner, but focus on the circle and watch for the cross to disappear.

Result:

- 1) Blind spot of my right eye is _____ cm
- 2) Blind spot of my left eye is _____ cm

3. Identify the sex of the cockroach by observing the given specimen/picture /model and write two reasons.

Identification :

Reasons:

4. Identify the part marked in the given specimen / picture of the earthworm and write its significance.

Identification (Part) :

Reasons:

VIII. Identify the photograph / picture 'H' and write its economic importance

1. KANGAYAM BULL

Identification:

The photograph kept for identification is Kangayam bull.

Economic importance:

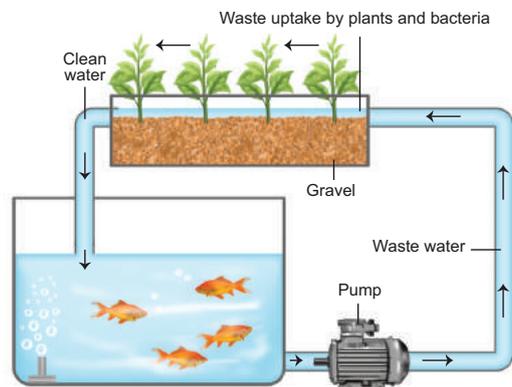
1. It is originated from the place called Kangayam in Tamilnadu.
2. This breed is meant for pulling carts, ploughing fields etc.
3. This breed is exclusively used in the traditional game called Jallikattu (manju virattu) in Tamilnadu.
4. It is a best example for a draught breed.



2. AQUAPONICS

Identification:

The photograph kept for identification is Aquaponics.



Economic importance:

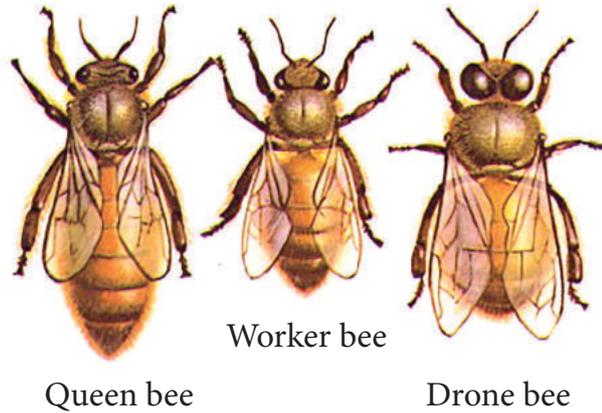
1. Aquaponics is a technique which is a combination of Aquaculture and Hydroponics.
2. It maintains balanced ecosystem by recycling the waste and excretory products produced by the fish.
3. Cultivable fishes like Tilapia, Gold fish, Kuduva etc. are cultured in aquaponics.
4. Plants like tomato, pepper and cucumber can be cultivated in this method.

3. HONEY BEE

Identification: The photograph kept for identification is Honey bee.

Economic importance:

1. The chief products of bee keeping industry are honey and bee wax.
2. Honey is the healthier substitute for sugar.
3. It is used as an antiseptic, laxative and as a sedative.
4. Bee wax secreted by the abdomen of the worker bee is used for making candles, polishes for floors and furniture etc.



4. BOMBYX MORI

Identification:

The photograph kept for identification is silkworm *Bombyx mori*

Economic importance:

1. Silk fibre produced by this silkworm is called mulberry silk.
2. It mainly feeds on mulberry leaves
3. It is used in manufacturing silk cloths, fishing fibres, tyres of racing cars, in medical dressings, parachutes etc.
4. It is exclusively cultivated in the states of Karnataka, Andhra Pradesh and Tamilnadu.



Zoology Practical - CLASS: XI

CHAIR PERSONS AND ADVISORY COMMITTEE:

Dr. SULTAN AHMED ISMAIL
Scientist,
Eco-science Research Foundation,
Chennai.

Dr. P.K. KALEENA
Associate Professor,
Department of Zoology,
Presidency College,
Chennai.

SUBJECT EXPERT AND COORDINATOR:

Dr. S. SHAMEEM
Deputy Director, SCERT,
Chennai.

CONTENT WRITERS:

Mr. M. MAYILSAM Y
Senior Lecturer, DIET,
Krishnagiri District.

Dr. S. GANESAPANDIAN
Head Master,
Govt. Higher secondary School,
Kadukkai valasai,
Ramanadapuram District.

LAYOUT AND ILLUSTRATIONS

Gopu Rasuvel
Prabha
Vinod

Mr. V. RAJENDRAN
P.G Assistant in Zoology,
Govt. Higher Secondary School,
Aragalur, Salem District.

Mrs. M. ANUSUA CATHERINA CHELLIAH
PG Assistant in Zoology,
Presidency GHSS, Egmore.

Mr. J.M. BRITTO FELICIOUS
PG Assistant in Zoology,
KLK GBHSS,
Gummudipoondi,
Thiruvallur District.

Mr. N. SENTHIL KUMAR
PG Assistant in Zoology,
Govt Boys Higher Secondary School,
Thalaivasal, Salem District.

Mrs. R.SURAMANJARI
PG Assistant in Zoology,
GRT.M.V Higher Secondary School,
Ashok Nagar,
Chennai – 83

COORDINATORS

Dr. V.T.SHANTHI
Seniour Lecturer,DIET,Tirur

Mrs. B.SELVI
Lecturer, SCERT,
Chennai.