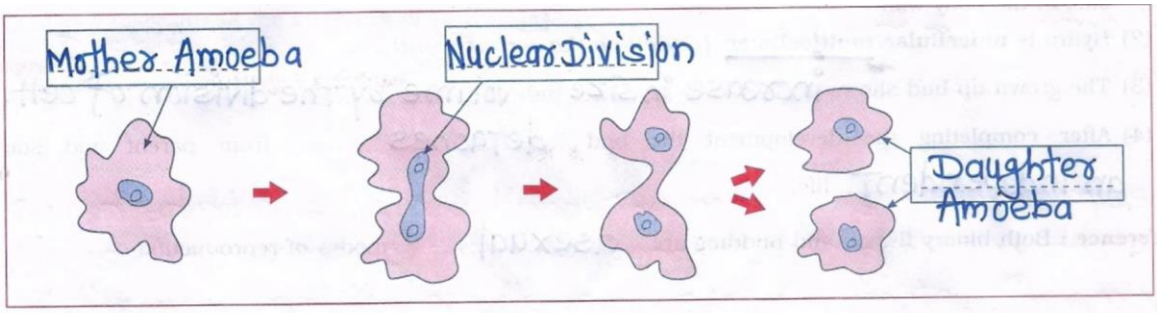
SCIENCE II PRACTICAL BOOK SOLUTIONS

PRACTICAL NO. 2

A. BINARY FISSION IN AMOEBA:



Binary fission in *Amoeba*

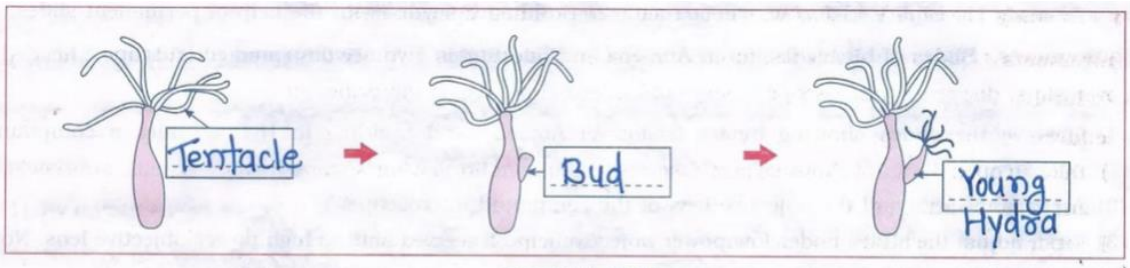
Observations :

(1) Binary fission of amoeba starts with the division of ...nucleus.....

(2) Binary fission is type of ..unicellular..... cell division.

(3) By binary fission one amoeba gives rise to .....daughter..... amoebae.

B. BUDDING IN HYDRA:



Budding in Hydra

Observations :

(1) When budding is performed, Hydra produces a protuberance on the lateral side of the body wall.

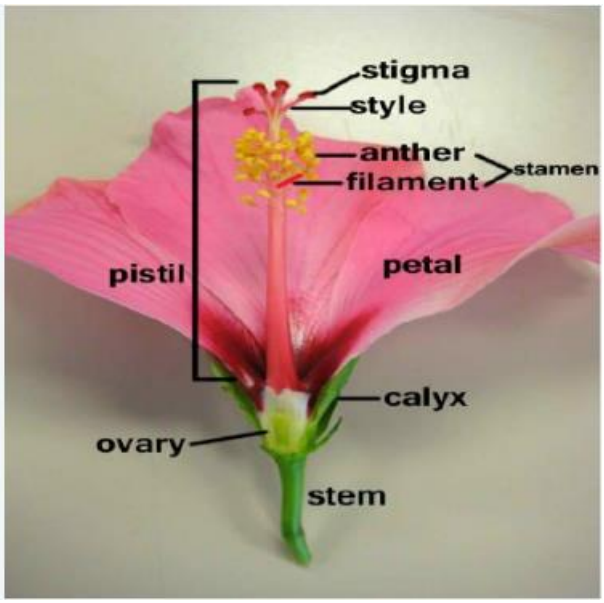
(2) Hydra is **unicellular/multicellular**. *(Underline the correct word)*

(3) The grown up bud shows increase in size and volume by the division of cell.

(4) After completing the development the bud ..detaches..... from parent and starts an independent life.

Inference : Both binary fission and budding are ...asexual..... modes of reproduction.

PRACTICAL NO. 3- STUDY OF HIBISCUS FLOWER



OBSERVATION:

WHORL OF FLOWER	NUMBER/MEMBER	DESCRIPTION	FUNCTION
Epicalyx	5-8 bracteoles	Green in colour	Photosynthesis
Calyx	5 sepals	Green in colour	Photosynthesis and protects the flower in bud condition
Corolla	5 petals	Large, attractively coloured	Attracts the insects for pollination
Androecium	Many stamens	Stamens are fused to form a staminal tube. Anthers bear pollen grains	Pollen grains contain the male gamete needed for fertilization
Gynoecium	5 carpels	Each carpel consists of stigma, style and ovary	Ovary bears the ovules (eggs)

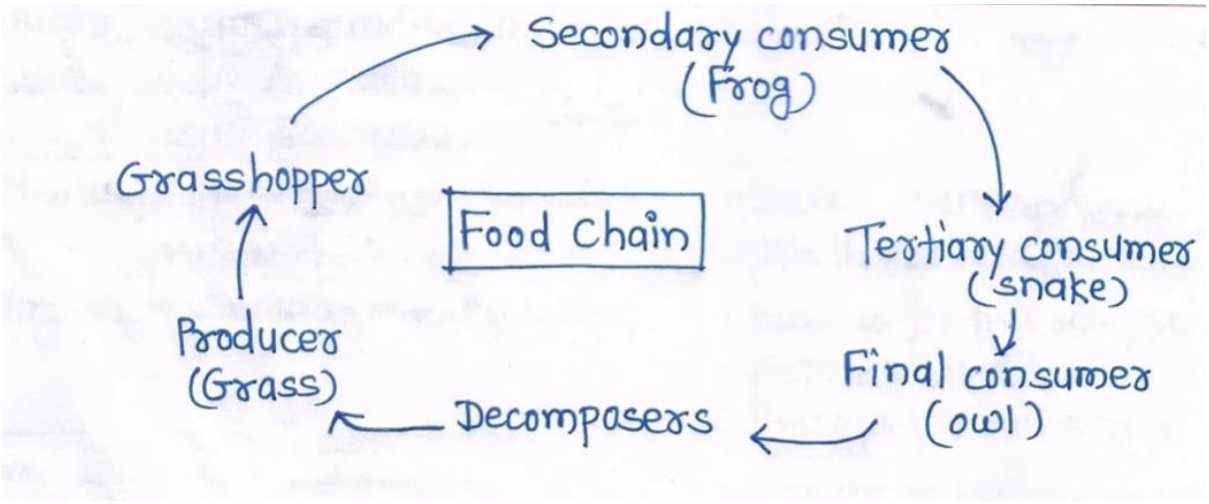
Function of flower:

Flower is the reproductive part of plant. After fertilization it gets converted into fruits bearing seeds.

PRACTICAL NO. 5- STUDY OF ECOSYSTEMS

OBERVATIONS:

ECOSYSTEM	ECOSYSTEM I	ECOSYSTEM II
Date of study		
Name of ecosystem	School garden	Pond
Abiotic factors	Sunlight, wind, soil	Water, soil, sunlight, air
Biotic factors	Butterflies, insects, birds, microbes, plants, children.	Fish, insects, frogs, microbes, aquatic plants
General description	Man made ecosystem with limited varieties of plants.	Aquatic ecosystem occurring on its own with many types of plants and animals.
Conclusion	Comparatively not a healthy ecosystem as it has human interference.	It is a healthy ecosystem.

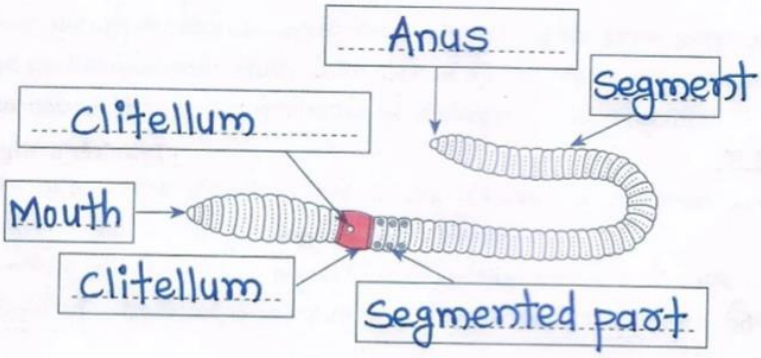


Conclusion : Draw the inference about the health of ecosystem that you have studied. Check-up whether this ecosystem is sustaining or is threatened due to human activities.

Out of the ecosystems that I have studied, I found ...Natural..... ecosystem as the most healthy and balanced and in good condition, because, ecological balance is a term used to describe the equilibrium between living organisms such as human being, plants and animals as well as their environment. So this balance is very important because it ensures survival, existence and stability of the environment.

PRACTICAL NO. 6- STUDY OF NON-CHORDATE ANIMALS

1. EARTHWORM:



Earthworm

Classification of Earthworm :

Kingdom : Animalia

Subkingdom : Non-chordata

Phylum : Annelida

Scientific name : *Pheretima posthuma*

Observations : Characteristics of Earthworm.

(1) The body of earthworm is elongated and cylindrical. It has mouth and anus at the opposite ends.

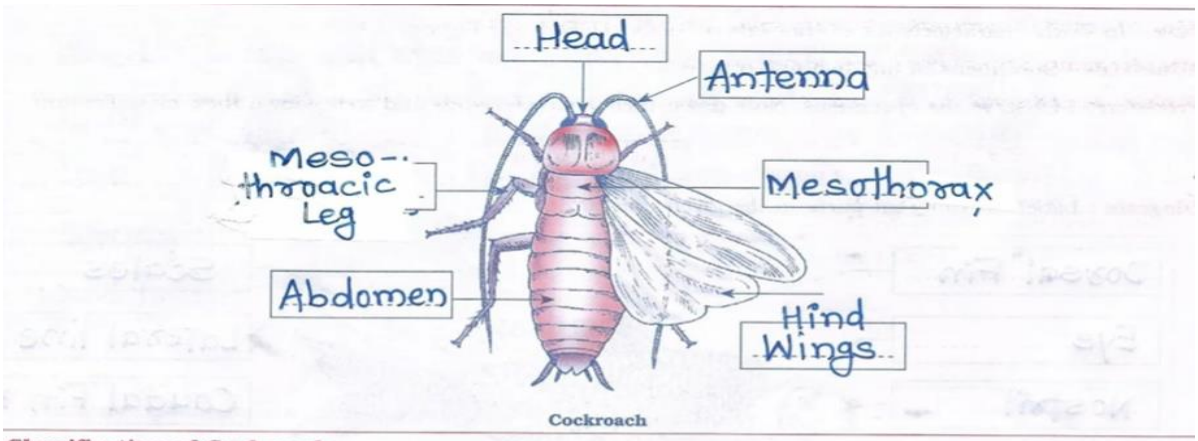
(2) The body is externally segmented, with about 100 to 150 segments in the body.

(3) A prominent brown-coloured band called clitellum is present in the anterior region of the body covering the segments 14th, 15th and 16th.

(4) Earthworm is a bisexual animal crawling in soil. It is said to be a friend of farmer.

(5) It is used for vermicompost, therefore they play an important role in solid waste management.

2. **COCKROACH:**



Cockroach

Classification of Cockroach :

Kingdom : Animalia

Subkingdom : Non-chordata

Phylum : Arthopoda

Class : Insects

Scientific name : *Periplaneta americana*

Observations : Characteristics of cockroach.

(1) The body of cockroach is narrow, bilaterally symmetrical, and dorso ventrally flattened.

(2) The whole body is covered externally by a chitinous coticle.

(3) The body of cockroach is divisible into three parts, viz., head, thorax and abdomen.

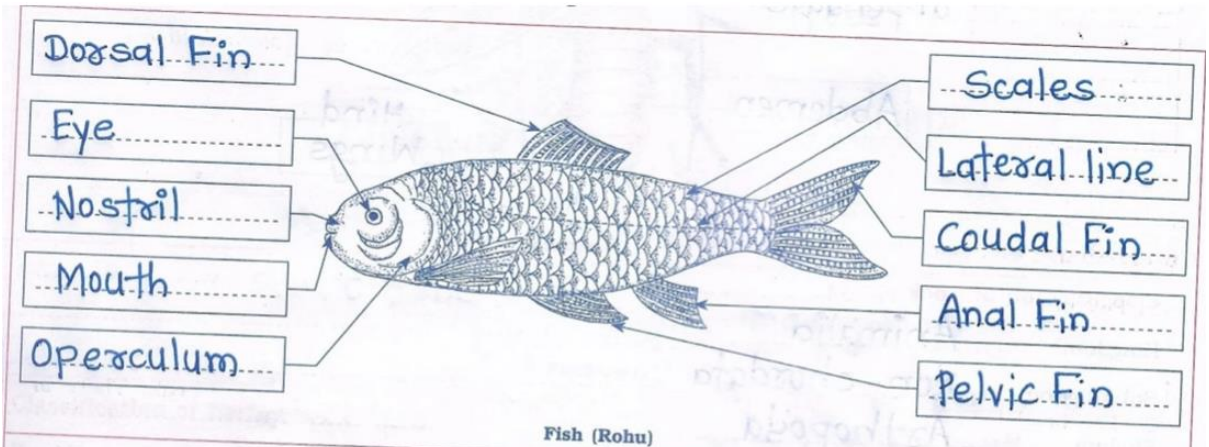
(4) The head on its each side bears a large compound eye and a long, slender and segmented antenna.

(5) There are three pairs of walking legs.

(6) Cockroach is a nocturnal pest which is carrier of diseases.

PRACTICAL NO. 7- STUDY OF CHORDATE ANIMALS

1. FISH:



Fish (Rohu)

Classification of Rohu :

Kingdom : Animalia
Phylum : Chordata
Subphylum : Vertebrata
Class : Pisces
Subclass : Teleastei
Scientific name : *Labeo rohita*

Observations : Characteristics of Rohu :

(1) Rohu is a fresh water fish having bony skeleton.

(2) The body is spindle shaped with dark or bluish black dorsal side and silvery white ventral and lateral sides.

(3) Exoskeleton is of scales.

(4) The head is large with a terminal mouth. Eyes are large, without eyelids.

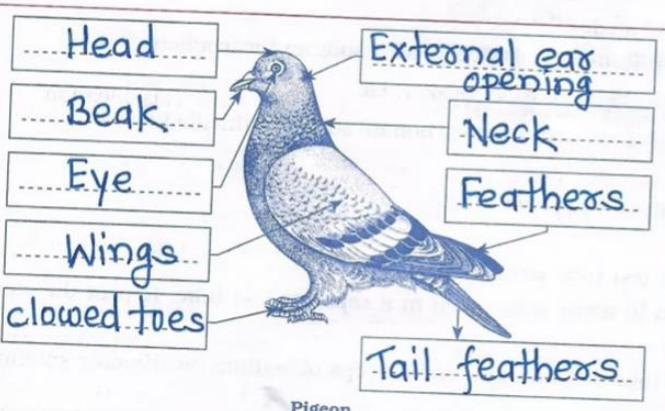
(5) Gills are covered by bony operculum.

(6) The dorsal, ventral and coudal fins are unpaired while the pectoral and Pelvic fins are paired.

(7) The coudal fin is used for changing the direction while swimming.

2. **PIGEON:**

Diagram : Label the different parts in the given diagram.



Pigeon

Classification of pigeon :

Kingdom : Animalia

Phylum : Chordata

Subphylum : Vertebrata

Class : Aves

Scientific name : *Columba livia*

Observations : Characteristics of Pigeon.

(1) Pigeon's body is divisible into four parts, viz., head, neck, trunk and tail.

(2) The head bears a pair of nostrils, a pair of eyes and a stout beak. There are no teeth.

(3) The forelimbs are modified into wings which are used for flying.

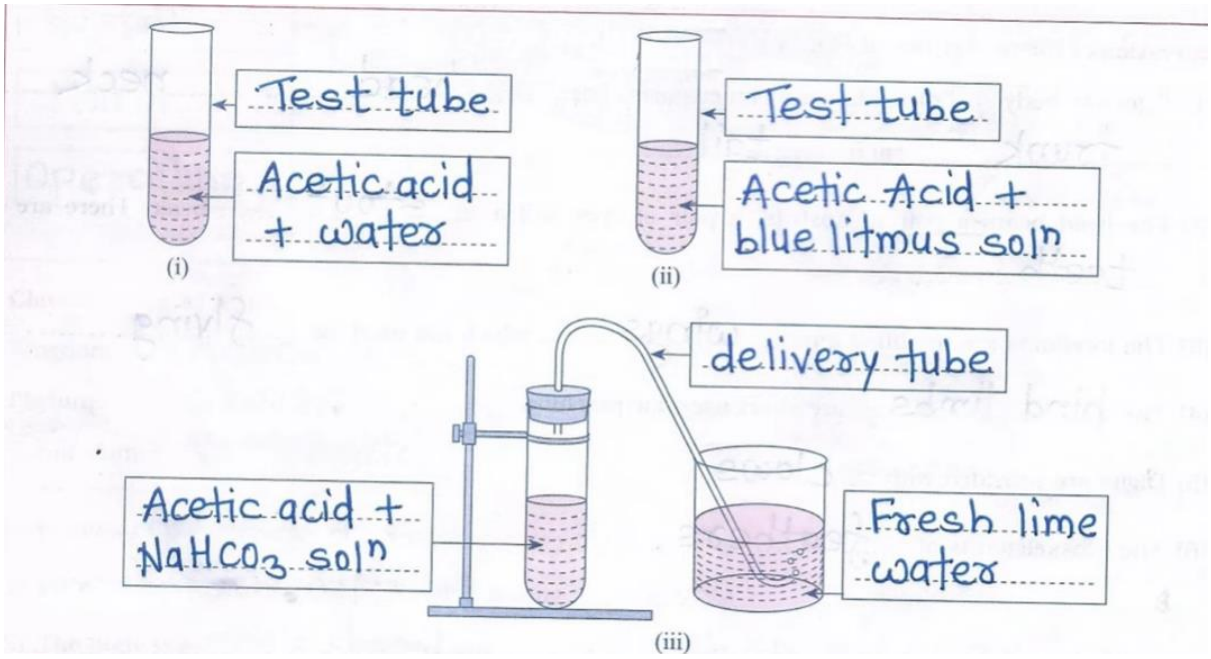
(4) The hind limbs are short used for perching.

(5) Digits are provided with claws.

(6) The exoskeleton is of feathers.

PRACTICAL NO. 8 - STUDY OF DIFFERENT PROPERTIES OF ACETIC ACID

Procedure:

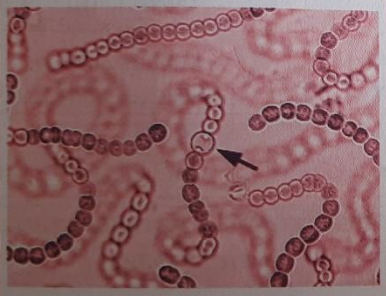


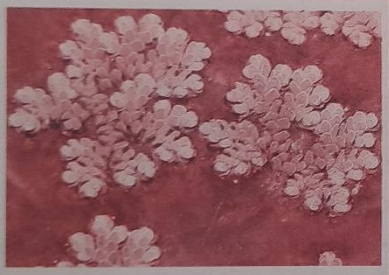
Observation & Inference:

Sr. No.	Test	Observation	Inference
1.	Odour	Peculiar odour of vinegar	Acetic acid has odour like vinegar.
2.	Solubility	Soluble in water	Acetic acid is miscible with water.
3.	Blue litmus solution test Red litmus solution test	Blue colour of litmus solution changes to red. No change in colour	Acetic acid is acidic in nature.
4.	Reaction with sodium bicarbonate solution	A colourless, odourless gas is liberated with brisk effervescence.	Acetic acid liberates carbon dioxide gas on reacting with sodium bicarbonate solution.
	Pass the gas through fresh lime water.	Lime water turns milky. After passing more gas it becomes clear.	

PRACTICAL NO. 10 – Bio fertilizers

Observation:

Organism	Diagram and classification	Characteristics	Uses
Azotobacter	 Kingdom : Monera Division : Proteobacteria Example : *Azotobacter*	• Oval and round in shape. • Develop hard crust around. • Freely living in soil.	1. Ability to fix molecular nitrogen and therefore increase the soil fertility and stimulate plant growth. 2. *Azotobacter* species are widely used in agriculture, particularly in nitrogen biofertilizers such as azotobacterin.
Nostoc	 Kingdom : Monera Division : Cyanobacteria Example : *Nostoc*	• Found in various environments that forms colonies. • Found in soil, on moist rocks, at the bottom of lakes and springs, both fresh and saltwater. It is free living there. • Also grows symbiotically in the plants' tissues.	1. *Nostoc* contains two pigments, blue phycocyanin and red phycoerythrin, as well as chlorophyll. 2. It can fix nitrogen in specialized cells called heterocysts. 3. Also used as supplementary food due to vitamins and proteins in them.

Organism	Diagram and classification	Characteristics	Uses
Anabaena	 Kingdom : Monera Division : Cyanobacteria Example : *Anabaena*	• Filamentous cyanobacteria that exist as plankton. • Can live symbiotically with *Azolla*.	1. Found in paddy as natural fertilizer. 2. They produce toxic neurotoxins and hence are useful to keep away the grazing animals from farms.
Azolla	 Kingdom : Plantae Division : Pteridophyta Example : *Azolla*	• *Azolla* floats on the surface of water by means of numerous, small, closely overlapping scale-like leaves. • Their roots are hanging in the water. • They form a symbiotic relationship with the cyanobacterium *Anabaena*.	1. Can fix atmospheric nitrogen 2. Traditional cultivation as a biofertilizer for paddy. 3. Used as livestock feed. 4. *Azolla* is rich in proteins, essential amino acids, vitamins and minerals. 5. Destroys worms due to wormicidal properties.

Inference : Biofertilizers are non-polluting option for increasing crop production.

PRACTICAL NO. 12 – Bio fertilizers

Observation : CO_2 evolved during respiration of germinating seeds will be absorbed by KOH pellets. This creates a partial vacuum in the conical flask. So, the water level in the bent tube rises.

Inference : Carbon dioxide is given out during respiration in plants.