

Chapter 6:

LIST OF PRACTICALS AND APPARATUS: _____

PRACTICALS IX-X

Chapter 1: Introduction to Biology

1. Study of different types of bacteria with the help of prepared slides and of *Amoeba*, *Paramecium*, *Volvox* from prepared slides/ fresh culture/charts
2. Study of external morphology of mustard plant and microscopic examination of root, stem, leaf, flower, fruit and seeds
3. Identification of major organs and organ systems in a dissected frog (Dissection by demonstrator / teacher)

Chapter 2: Solving an Biological Problem

- ☛ No Practical Activity

Chapter 3: Biodiversity

4. Observation of the apparent distinguishing taxonomic characters from fresh and preserved specimens and recognition of plants and animals on the basis of their taxonomic characters
5. Evaluation of graphs of a population of an insect, which is endangered (due to excessive use of insecticides) and interpret the reasons for its endangered status

Chapter 4: Cells and Tissues

6. Use of microscope to observe movement of water in plants and to compare sizes of various types of cells
7. Examination under the microscope an animal cell (e.g. from frog's blood) and a plant cell (e.g. from onion epidermis), using an appropriate temporary staining technique, such as iodine or methylene blue
8. Identify, from fresh preparations, the cell membrane, nucleus and cytoplasm in an animal cell and the cell wall, cell membrane, sap vacuole, cytoplasm, nucleus and chloroplasts in a plant cell
9. Preparation of the wet mounts of tissue from flowering plants and study of plant and animal tissues from charts and prepared slides
10. Determination of the effect of tonicity on plasmolysis and deplasmolysis in plant cells or in Red Blood Cell
11. Data collection on the number of stomata per unit area on various plant leaves that grow in areas of differing humidity, and compilation of data in a spreadsheet and graph it to determine whether there is a relationship between the variables

Chapter 5: Cell Cycle

12. Observation of various stages of mitosis and meiosis by slides, model and charts
13. Preparations of root tip squashes and study stages of mitosis

Chapter 6: Enzymes

14. Experiment to show working of enzyme in vitro e.g., pepsin working on meat in test tube

15. Experiment to test enzyme action by putting diastase in a starch solution in test tube at 37°C and after fifteen minutes performing iodine test for presence of starch

Chapter 7: Bioenergetics

16. Demonstration of the process of photosynthesis using an aquatic plant, like *Hydrilla*
17. Identification and labeling of the cellular and tissue structure in the CS of a leaf through observation under the microscope
18. Investigation of the necessity of chlorophyll, light, carbon dioxide, using appropriate controls
19. Experiment to demonstrate the process of respiration in germinating seeds by using limewater
20. Investigation of the release of carbon dioxide and heat during Aerobic Respiration in germinating seeds

Chapter 8: Nutrition

21. Food tests: Benedict's test for reducing sugar, iodine test for starch, spot test and emulsion test for fat, and Biuret test for protein in solution
22. Microscopic examination of a transverse section of the small intestine to show the villi

Chapter 9: Transport

23. Measurement of differences in length/weight of raw potato strips in concentrated salt solution and water
24. Observation of root hairs on a growing root of onion, carrot etc
25. Microscopic observation of the structure and number of stomata in an epidermal peel of a leaf
26. Investigation of the rate of water loss at the two surfaces of a leaf by a simple experiment using cobalt chloride paper
27. Investigation of transpiration in potted plant under a bell jar
28. Identification of xylem and phloem tissues in the prepared slides of stem, root and leaf
29. Investigation of the pathway of water in a cut stem, using a suitable stain
30. Identification of red and white blood cells under the light microscope on prepared slides and in diagrams and photomicrographs
31. Investigation of the effect of physical activity on pulse rate
32. Experiment to show the capillary flow in a fishtail or fin or frog's web

Chapter 10: Gaseous Exchange

33. Activity to compare the breathing rate at rest and after exercise
34. Experiment to find out how much air a person can take into his lungs
35. Demonstration through experiment of breathing out air into limewater that carbon dioxide is exhaled during respiration
36. Demonstration of the presence of tar in cigarette smoke and also by charts showing pictures of lungs of smokers and nonsmokers

Chapter 11: Homeostasis

37. Examination of the structure of kidney (sheep kidney / model)

Chapter 12: Coordination in Man

38. Observation and recording of the difference in quickness of response of the two types of coordination (by asking a student to say a few words in front of the class and observe the change in heartbeat)
39. Experiment to observe the contraction in the shin muscle of frog in a Petri dish filled with methylene blue and using 12 V DC current
40. Study of bull eye

Chapter 13: Support and Movement

41. Investigation of the nature of bone (by putting three pieces of rib bone of lamb in water, NaOH and dilute HCl)

Chapter 14: Reproduction

42. Observation of binary fission of ameba using slides, photomicrographs or charts
43. Observation of budding in yeast from prepared slides
44. Examination of a bulb (onion), corn (*Edocasia*), rhizome (ginger) or stem tuber (potato) and its cultivation to get new plants
45. Propagation by stem cuttings (rose or any locally available plant) and *Bryophyllum* leaf
46. Examination of Mustard flower, Gram seed and Maize grain
47. Investigation of the conditions for seed germination

Chapter 15: Inheritance

48. Recording the heights of class fellows to predict which kind of variation is it and presentation of the data of class fellows' heights in graphical form (either histogram or bar chart)

Chapter 16: Man and His Environment

49. Investigation of an ecosystem e.g. a balanced aquarium/pond

Chapter 17: Biotechnology

50. Investigation about the role of yeast and bacteria in the fermentation of flour and milk

Chapter 18: Pharmacology

- No Practical Activity

REQUIRED APPARATUSES, CHEMICALS, CHARTS AND MODELS

Sr. No.	APPARATUSES	Qty
1.	Aquarium	01
2.	Aquarium net	01
3.	Balance	10
4.	Beaker (50ml, 100ml, 250ml, 500ml, 1000 ml)	10 Each
5.	Bell jar	20
6.	Blades (Safety razor)	20
7.	Burner (Bunsen)	10
8.	Burner (Spirit Lamp)	20
9.	Conical Flask	20
10.	Cotton Wool	04
11.	Differential air Thermometer	10
12.	Dissecting Board	20
13.	Dissecting Box	20
14.	Dissecting Tray	20
15.	Dropper	20
16.	Funnel 4" and 6" dm	20 Each
17.	Glass Tube	04 Packets
18.	Incubator	01
19.	Inoculation Loop	06
20.	Insect Net	12
21.	Lens Paper	06
22.	Light Source	10
23.	Magnifying Glass	10
24.	Measuring Cylinder	10
25.	Microscope (Compound: 10X eye piece, 4X, 10X and 40X objectives)	20
26.	Microscope (Dissecting)	20
27.	Microscope Cover Slip	04 Packets
28.	Microscope Slide	04 Packets
29.	Petri Dish	20
30.	Pipette (10 ml)	10
31.	Plant Presser	04
32.	Plate (Glass)	06
33.	Potometer	04

34.	Preserved Specimens of representative animals	01 Each
35.	Reagent Bottles	20
36.	Specimen Jars	10
37.	Stop Watch	05
38.	Stopper (Cork)	20
39.	Syringe	10
40.	Test Tube Rack	08
41.	Thermometer	20
42.	Thermos Flask	20
43.	Tripod Stand	10
44.	Watch Glass	20

Sr. No.	PREPARED SLIDES	Qty
45.	Bacteria	02
46.	Cells of onion epidermis and <i>Hydrilla</i> Leaf	02
47.	Conjugation in <i>Paramecium</i>	02
48.	Mitosis and Meiosis in Onion root tip	02
49.	Nerve Cell	02
50.	Rhizopus and Mushroom	02
51.	Section of Mammalian kidney	02
52.	Sections of animal tissues	02
53.	Transverse Section of Artery, Vein and Capillary	02
54.	Transverse Section of Human Small Intestine	02
55.	Transverse Section of Leaf, Root and Stem of <i>Brassica</i>	02
56.	Transverse Section of Mammalian Air sacs	02
57.	Transverse Section of Woody stem	02

Sr. No.	CHEMICALS	Qty
58.	Acetic acid	2.5 Liter
59.	Alcohol	2.5 Liter
60.	Ascorbic acid	2.5 Liter
61.	Benedict's solution	2.5 Liter
62.	Bromothymol blue solution	2.5 Liter

63.	Chloroform	2.5 Liter
64.	Copper sulfate solution	2.5 Liter
65.	Diastase	2.5 Liter
66.	Distilled water	2.5 Liter
67.	Eosine	2.5 Liter
68.	Ethanol	2.5 Liter
69.	Formaline	2.5 Liter
70.	Glucose solution 01%	2.5 Liter
71.	Glycerine	2.5 Liter
72.	Hydrogen carbonate indicator	2.5 Liter
73.	Iodine solution 01%	2.5 Liter
74.	Lime water	2.5 Liter
75.	Methylene Potassium hydroxide blue 01%	2.5 Liter
76.	Starch	2.5 Liter
77.	Sudan III solution	2.5 Liter
78.	Trypsin	2.5 Liter
79.	Wax	2.5 Liter

Sr. No.	CHARTS	Qty
80.	Animal and Plant Cell	01
81.	Biodiversity	01
82.	Biogeochemical Cycles	01
83.	Cell Division	01
84.	Germination	01
85.	Human Body Systems	01
86.	Mandelian Genetics	01
87.	Mechanism of Enzyme Action	01
88.	Plant Propagation	01
89.	Reflex Arc	01
90.	Sexual Reproduction in Plants	01
91.	Structure of DNA	01
92.	Transport of Material in Plants	01

Sr. No.	MODELS	Qty
93.	DNA	01
94.	Human Brain	01
95.	Human Diaphragm and Intercostal Muscles	01
96.	Human Ear	01
97.	Human Eye	01
98.	Human Kidney	01
99.	Human Skeleton	01
100.	Neuron	01
101.	Pitcher Plant	01
102.	Sundew Plant	01