

ISC Class 12 Biology Practical Syllabus

1. Taxonomy: Study floral characteristics through dissection of flowers, drawing floral formula and diagrams of following families:

(i) Malvaceae: type – China rose / Hollyhock.

(ii) Leguminosae: subfamily – Papilionaceae – type – Sweet pea/ Pea/ Bean/ Sesbania/ Clitoria (single flower).

(iii) Solanaceae: type – Petunia / Datura / Brinjal
Flower / Solanum nigrum.

(iv) Liliaceae: type – Onion or Amaryllidaceae – type – Lily/Spider lily/ Tiger lily/ Tube rose/ Gladiolus.

Floral characteristics should be explained by dissection of flowers. Students should be taught how to cut vertical section of the flower and draw accurately labelled diagrams. The technique of drawing floral diagrams with the mother axis in the right position is necessary. Floral formula should be correctly written. Identification of the correct family giving reasons, technique of cutting T.S. and L.S of ovary should be explained and accordingly correct labelled-diagram should be drawn.

Students should know the examples of plants (belonging to each family) which are of economic importance. The examples of common names of plants must be supported with correct scientific names as well.

NOTE: In the examination, candidates will be tested on any one of the above families.

2) Simple biochemical and physiological experiments

(i) Study of arrangement/distribution of stomata in dicot and monocot leaves.

(ii) Study of soils from two different sites.

Collect soil samples from two different areas and make a comparative study of their texture, moisture content, humus content, water holding capacity and pH.

Guidelines for collection of soil samples:

- Texture - loamy, sandy and clayey soil.
- Moisture content – Soil samples are to be collected from a dry place and a wet place. Alternatively, samples of soil can be dried to different degrees in oven/by keeping in sun.
- Humus Content – Collect one sample from roadside/barren land and one sample from garden/cultivated field.
- Water holding capacity – Pour given amount of water in known weight of soil sample and record the volume of water retained by the soil sample.

- pH – Add water to the soil sample and test with pH paper.

Students should be taught to set up and demonstrate the experiments with correct diagram of the setup, record their observations methodically and give conclusions. This will give a clear idea of the physiological processes. Questions can be asked based on the above physiological processes studied.

(iii) To study the effect of enzyme (amylase) action at three different temperatures and pH on starch solution.

Effect of enzyme (amylase/ diastase) action at three different temperatures (low- below 10°C, optimum – 37°C and high – above 70°C) and pH (acidic, neutral and basic) on starch solution.

(iv) To isolate DNA from available plant material.

Isolation of DNA from spinach leaves, green pea seeds, pulp of banana and papaya. Take half a ripe and peeled banana into a beaker and add 50 ml of extraction fluid (1.5gm table salt +10 ml liquid detergent+90 ml distilled water). Place the beaker in a water bath set at 60 °C for 15 minutes. Stir gently with a glass rod. Filter 5ml of cooled content into a clean test tube and add 5ml of cold 90% ethanol. DNA molecules separate out and appear as white fibres.

3) Slide preparation

- (i) Germination of pollen grain in a nutrient medium.
- (ii) T.S. of ovary of any locally available flower, to show marginal / axile placentation.
- (iii) T.S. of a hydrophyte stem.
- (iv) T.S. of a xerophytic leaf (Nerium).
- (v) L.S. of monocot and dicot seed (soaked seeds of maize/wheat, pea/ bean.)

The technique of staining and mounting neatly should be explained. Students should also know how to make labelled outline diagrams. They should also be taught to identify the mount under low/ high power of microscope. Two identifying features of the above need to be mentioned.

4) Spotting: (three minutes to be given for each spot which includes identification, drawing a labelled diagram and writing at least two identifying characteristics).

NOTE: Spotting must be done on a separate answer sheet during examination, which should be handed over to the Examiner immediately after spotting.

- (i) Identify and comment on the following:
 - (a) T.S. of ovary of mammal (Permanent slide).
 - (b) T.S. of testis of mammal (Permanent slide).
 - (c) Germinating pollen grain (slide/chart).

(d) T.S. of ovary to show the type of placentation (marginal, axile, basal, parietal).

(e) T.S. of blastula / blastocyst of a mammal (chart/ slide).

(f) Whole mount of Plasmodium sporozoite (slide /chart).

(g) Whole mount of Entamoeba histolytica trophozoite (slide/chart).

(h) Preserved specimen/ chart/ model of Ascaris.

(ii) Comment upon ecological adaptations of plants and animals.

Models/ virtual images/ charts of one plant and one animal found in xeric and aquatic habitats.

(iii) Flowers adapted to pollination by different agencies – insect and wind.

Students should be able to identify the type of pollination of the given flower, draw the diagram of the flower and give two reasons for the type of pollination. Example: Hibiscus and grass.

Students should be taught how to identify, draw, label and give significantly visible characteristics as observed, of each spot, in a given time of three minutes. 'T.S.', 'model', 'whole mount', 'chart', 'image' of the specimen should be mentioned as a part of identification.