

(10) *Agriculture.*

The candidate will be expected to show (a) that he has a practical knowledge of the operations incident to the work of a school-garden, and (b) that he has conducted experiments and observations bearing on the life and growth of plants, on the lines indicated below under the head of "Experimental and Observational Work":—

(a) *Work in the Garden.*—General: Preparation of the land; digging, trenching, hoeing, raking, and surface cultivation. Drawing drills. Sowing, thinning, pricking off, hardening, and planting out seedlings. Methods of treating light and heavy soils. Fertilizers; the time of year and the condition in which to apply fertilizers; the selection of fertilizers for particular purposes. Use of lime, soot, clay, road-sweepings, ashes, leaf-mould, &c., as soil-improvers. Arrangement of the garden to the best advantage from the points of view of space, succession of crops, and weeding.

Special: Methods of plant-cultivation. Cultivation and management of—

- (i) Green, pod-bearing, and tap-rooted vegetables, potatoes, onions, vegetable marrows, tomatoes. Gathering and storing of vegetables.
- (ii) Cereals and other grasses, and fodder-plants generally. Succession of crops. An elementary study of the common weeds of the candidate's district.

(b) *Experimental and Observational Work.*—The seed: Parts of the seed. Conditions necessary for germination and growth. Testing the vitality of seeds. The collection and preservation of seed. Experiments illustrating the phenomena of germination and the establishment of the young plant (*e.g.*, absorption of moisture by seeds; temperature of and pressure exerted by germinating seeds; how seeds escape from their covers; how seeds get buried in the soil; how young plants get above the ground; and how they deal with obstacles met with during the process; how seeds on the surface get their roots into the ground; proof that germinating seeds take in oxygen and give out carbon dioxide, &c.).

The root: The function of the root. Root-systems. The use of root-hairs and root-caps. Effect of injury to these parts. How roots grow. Experiments illustrating the work of roots (*e.g.*, relation between root-hairs and soil-particles; exploration of soil by roots in search of moisture; the quantity of water required by roots; use made by roots of mineral matters dissolved out of soil by water; proof that roots require air and give out carbon dioxide, &c.).

The leaf: The general structure, forms, and functions of leaves, treated simply.

Stems and their modifications. Buds.

The flower and fruit: The parts of the flower and their functions. Causes influencing the opening and closing of flowers. Pollination. The formation of fruits. Different types of fruits. Devices for the protection of seeds from foes. Dissemination of seeds.

The soil: How soil is made. The mechanical analysis of soil. The texture of soil. The soil as a sponge from which a plant may obtain water, as a storehouse of plant-food, and as a laboratory in which plant-food is prepared and dissolved. Experiments with soils (*e.g.*, how moisture is held in the soil; how moisture moves through the soil; how the moisture-holding capacity of a soil may be increased; conservation of moisture; evaporation at surface of different soils; how the texture of a soil may be improved; conditions governing soil temperature).

The candidate will be required to forward before the date of examination a certificate in the prescribed form that he has carried out satisfactorily a course of practical work based on the above syllabus.

(11) *Botany.*

The candidate will be required to show that he has acquired his knowledge of the following topics by observation, investigation, and experiment:—

The organs of flowering-plants, their arrangement and principal modifications; their functions, so far as can be ascertained by observation and simple experiments.

The main phenomena of the life-history (excluding microscopic processes) of common flowering-plants; germination; establishment and growth; comparison of different types of germination; the mechanism of pollination; fruit and seed dispersal.

Adaptation of plants to their surroundings and to cold and drought; protection against animals. Comparison of creeping-plants, climbing-plants, rosette-forming plants, grass-like plants, shrubs and trees. Plant societies.