3. If a paddock of pasture, with heavy soil, in a dry district is overrun with twitch (*Poa pratensis*), explain fully how you would break it up and render it fit for a crop of oats. Give reasons for all the treatment you recommend.

4. Give any two instances that you have noticed of sour land. State what you know of the causes of the sourness. What methods would you in general adopt for sweetening sour land?

5. How would you demonstrate to a class the general effect upon plant life of (*a*) stagnant water, and (*b*) an insufficient water-supply? State what the effect would be in each case.

6. Explain why different manures are used for different crops. Give actual examples, with the quantities of manure to the acre.

7. Explain why (*a*) overdraining and (*b*) continual repetition of the same crop exhaust land. What effect would each of these exert upon a crop of wheat in a dry season?

Elementary Knowledge of Agriculture.—For Class D. Time allowed: Three hours.

1. Give one instance in each case of plants cultivated for the following: (*a*) fruit; (*b*) seed; (*c*) foliage; (*d*) root; (*e*) underground stem. Explain in each case the benefit that the plant would, if undisturbed, derive from the development of the organ specified?

2. In dry weather heavy soils frequently develop surface cracks. Discuss the possible causes and effects of this, and explain how the evil may be minimised?

3. How would you demonstrate to a class the action of capillarity in modifying the effect of evaporation?

4. Give the notes that you would use in giving a lesson on manures.

5. Describe any two instances you have seen of rotation of crops. Give the reasons for the particular rotation adopted, and discuss its advantages and disadvantages.

6. What are the general advantages derived from pruning apple trees? How would you prune (*a*) a tree ten years old that had never been pruned before; (*b*) a tree of the same age that had been regularly pruned; (*c*) a tree that had run to wood and bore little fruit; (*d*) a tree that bore much fruit but made little wood; (*e*) a tree badly blighted by the woolly aphis?

7. Why must nitrogenous manures be applied although the air contains large reserves of nitrogen? Why do some plants never require nitrogenous manures?

General Agriculture.—For Civil Service Senior. Time allowed: Three hours.

1. Name, with examples, all the plant organs you can that are used as storage organs Explain the advantage that the plant derives from the development of storage organs.

2. What is a soil? Explain the action of the various agents that cause the formation of a rich soil from a basaltic rock.

3. Explain the use of water in a soil. What method would you adopt for retaining moisture near the surface of a soil in dry weather, and explain the action of the method you would use? In what soils does excess of moisture occur? How may the excess be removed?

4. Define a manure. Why does rich vegetation often grow spontaneously on land that will not support a crop without manure? Compare the values and uses of farmyard manure, green manure, and superphosphate.

5. Describe and discuss the advantages of any particular instance of rotation of crops that you have seen.

6. Why are fruit trees pruned? How would you prune a peach tree, a pippin, and a cherry tree ten years old that had not been pruned in the previous season?

7. Give a short description of the construction of a drill for sowing wheat.

8. How should a flock of Shropshire ewes be treated and fed during a winter on heavy land where the grass has no feeding value?

Agricultural Chemistry.—For Civil Service Senior. Time allowed: Three hours.

1. What substances are commonly present in rain water? What effect, if any, has each of them upon an ordinary soil?

2. What is the effect of lime upon a soil? What would be the action of lime upon (*a*) ammonium sulphate, (*b*) superphosphate, (*c*) bonedust, (*d*) farmyard manure?

3. Much of the plant food in the soil is insoluble in water. Give as clear an account as you can of the natural processes by which this insoluble matter is rendered available.

4. What changes are effected in a soil by growing a crop and then ploughing it in? Under what circumstances are these changes most advantageous?

5. Give some account of the composition, uses, and sources of supply of the chief artificial manures.

6. How would you determine the amount of ash in a given sample of hay? What substances would you expect to find in the ash?

7. Explain the changes that take place in barley during the process of malting.

8. Explain the meaning of the term "albuminoid ratio" and its significance in estimating the value of a food.

9. What is the approximate composition of ordinary cow's milk? Explain exactly what happens when milk turns sour.