

2. Give an account of some flowering plants which have adopted a parasitic mode of living.

3. Mention 5 types of troublesome weeds known to you, giving an example of each. Explain how each is troublesome, and suggest methods of eradicating them.

4. Give a full botanical description of the various parts of a Cumbu plant (*Pennisetum typhoideum*). What other species of *Pennisetum* are you familiar with and how are they useful?

5. Describe the inflorescence and flowers of *Ricinus communis* and *Arachis hypogaea* and point out any special feature you note in them, with regard to pollination or fertilization.

6. What are the various ways of propagating plants other than by seeds? Discuss in full any two methods, stating what precautions you would take in each case.

Agricultural Botany II. Monday, 12th April, 1 to 4 P.M.

(Answer any five questions.)

1. How do plants obtain the energy needed for the performance of the different functions which are essential for their growth and development.

2. Explain how the different parts of plants respond to stimuli, namely, light, water and gravity. Also state why the parts respond in the manner you indicate.

3. What gases are needed for the proper development and growth of green plants? How do they obtain these gases and in what manner are they utilized.

4. Mention the various factors which constitute the environment of a plant and explain by means of well chosen examples how they affect the form and structure of plants.

5. State the laws discovered by Gregor Mendel bearing on inheritance, and explain them by means of examples,

6. Explain clearly how you would utilize the principles of Mendelism in the improvement of plants by selecting suitable examples.

Agricultural Chemistry. I. Thursday, 15th April, 7 to 10 A. M.

(Only 6 questions are to be answered. Questions 1 and 2 are compulsory.)

1. What do you know of artificial farm yard manure? How does it compare with natural farmyard manure. What are the changes which take place in each tending to preservation or loss of fertilizing ingredients? State how far any loss can be controlled in practice.

2. The first limiting factor for crop production is water, and the fertility of a soil depends as well on the movement of water in the soil as on the amount of water it can contain. Explain this statement and make your own comments on it.

3. Sulphate of ammonia, Chilian nitrate, and nitrolium, each of average good quality, are offered at the same price of Rs. 240 per ton. Compare the relative cost of nitrogen. What quantity of each will supply 100 lbs. of nitrogen? State with reasons, for what crops and under what conditions you will use and you will not use each manure. What harmful ingredients, if any, will you look for in each? what harmful effects, if any, may be produced by a continuous application of each.

4. What is the role of potassium in plant nutrition? Give a list of potash manures indigenous and imported. Discuss the importance of potash manures for South Indian soils and for particular crops.

5. Explain the chemical principles involved in the harvest of a sugar cane crop and in the boiling of cane-juice for jaggery and sugar.

6. Discuss the propriety of distinguishing between crude proteids and albuminoids with regard to a class of nutrients. How are they determined? Give the appropriate proportion of each in the following:—Wheat-bran, cholam fodder, cottonseed, potatoes, paddy straw, dholl husk, groundnut cake, and forest hay.

7. What factors would guide you in prescribing feeding standards for production of fat; milk growth and work? Show how you would arrive at a feeding standard for a cow yielding 30 lbs of milk daily.

3. What is butter? What should be the composition of good cow's butter? Why does butter sometimes become rancid, and can it be corrected? How can butter be distinguished from a butter substitute? Give a sketch of the apparatus used in the laboratory for the purpose.

Agricultural Chemistry, II. Thursday, 15 April. 1 to 4 p. m.

(Only 6 questions are to be answered. Questions 1 and 2 are compulsory.)

1. What are the chief methods employed in the extraction and purification of enzymes? In what is the velocity of action of the enzyme Trypsin influenced by (a) acidity, (b) temperature, and (c) concentration of the enzyme?

2. Draw up a scheme for a manurial experiment to test the value of cyanamide as a manure for cholam. Describe particularly the precautions you would take to eliminate errors.

3. What are the chief chemical changes taking place in the germination of a coconut? State what you know of the distribution of potash in the coconut tree at different stages of growth? How do you account for this distribution.

4. What is the function of a manure? Draw up a brief classification of manures, giving specific examples.

5. A solution is believed to contain a mixture of starch, cane-sugar and levulose. How would you confirm this? Describe the successive steps you would take to estimate the amount of each constituent present.

6. Give a short account of the nitrogen cycle in the soil under dry and wet land cultivation.

7. How would you determine the digestive coefficient of a fodder? State in particular what precautions you would take to reduce the error of your determination.

8. Describe briefly the process of photosynthesis of carbohydrates with special reference to any recent work on the subject with which you may be acquainted.

Agriculture. I Friday, 16th April, 7 to 10 A. M.

(Only 6 questions are to be answered. Question I is compulsory.)

1. (a) What importance do you attach to the co-operative insurance of live-stock. Do you know of any such attempts that have been made in the Madras Presidency?

(b) To what extent and in what ways does the principle of co-operation suggest a better system of relationship between employers and employees in agriculture.

2. Joint stock methods are not suited to agriculture. The true principle of agricultural organization is that of co-operation. Examine this statement.

3. (a) How much seed would be required per acre for the following crops :—Wheat, groundnut, Karunganny cotton drilled, indigo, potatoes and cholam?

(b) How would you distinguish good seed from bad and what precautions would you take in preparing the seed for sowing in each case?

4. What number of coolies and bullocks would be required to cut, cart, and stack a ten-acre (dry) field of periamanjai cholam grown for fodder?

5. When inspecting a farm, what observations would you make to enable you to report whether it was well or badly farmed?

6. Discuss the principal varieties of cotton grown in the Madras Presidency. What are the characteristics of a good cotton sample? Explain why they are important and what factors control them.

7. Explain the Law of Increasing and Diminishing Returns, and examine its application in agricultural production.

8. In looking for a dairy farm what main considerations would guide you in your choice?

Agriculture. II. Friday, 16th April. 1 to 4 P. M.

(Only 6 questions are to be answered.)

1. A rectangular area 40 acres of black cotton soil is acquired for a cotton breeding station. (a) Make a sketch-plan showing the most economic lay-out of the area. (b) Draw up a rotation to give the maximum area under cotton annually. (c) State briefly the buildings and equipments you would consider necessary for such a rotation.
2. Explain why it is necessary to sterilize dairy utensils, and state what you consider is the best method of doing so. A sample of milk allowed to stand for 6 hours becomes acid and putrefies, state the probable causes and give any practical methods you would adopt to remedy the defect.
3. A ryot purchases 10 acres of garden land. He has a capital of Rs. 2500 for expenditure on buildings, live-stock and equipment. Explain in detail how this capital can be most profitably employed. Enumerate and value the articles of equipment you would consider necessary.
4. You are asked to organise and arrange the labour on a mixed farm in the Coimbatore district containing 50 acres of garden land, 150 acres of dry arable land, and 50 acres of grazing land. Give in detail (a) the rotations you would recommend, (b) the class, number, and wages of permanent coolies employed, and (c) additional casual labour you would require, stating the season and work for which such labour would be required.
5. *Either*, Enumerate the soil factors which affect the plant growth and explain how these can be regulated and controlled by agricultural operations *or*, It is easier for a ryot to lease land than to buy it outright. Examine this statement and give briefly your own views on its accuracy, with reasons for your answer.
6. *Either*. Describe with the aid of sketches, an Alpha Laval Cream Separator. Explain what happens (a) if separated milk is passed through the separator, and (b) if the turning speed is increased to 70 revolutions per minute. *Or* irrigation water is available from a channel supply for single crop paddy land at a water rate of Rs. 20 per acre, Compare the cost of growing 5 acres

of paddy under this system with well irrigation where water is plentiful but has to be lifted 15 feet by mhotes.

Agriculture Essay. Saturday 17 April 7 to 10 a. m.

Write an essay on one of the following subjects :—

Either. The causes of poverty of Indian agriculturists. Can they be remedied? If so how? *Or,* The utilization of mechanical power in reducing cultivation expenses on a farm of 500 acres.

B. Sc. Ag. Degree Examination, 1926.

PART II

Botany Practical.

19th April 1926]

Paper I

[1 P. M. to 4 P. M.

1. Describe fully the specimen A and refer it to the family to which it belongs.
2. Identify the weeds B, C. and D. and explain the methods you would adopt in eradicating them.
3. Write critical notes on E, F. and G.
4. Oral Examination.

Botany Practical.

20th April 1926]

Paper II.

[1 P. M. to 4 P. M.

1. Make a detailed report on the sample of seed given.
2. Identify the slides A, B, and C and explain any special features in them.
3. Write short oecological notes on D, E. and F.
4. Oral Examination.

Agricultural Chemistry—Practical.

21st April 1926.

]Paper I.

[10 A. M. to 4 p. m,

Note:—Unfinished work, if any, may be completed next day, with regard to Questions I and II, but answer to Question III must be given on the first day.

I. Estimate the percentage of organic and ammoniacal nitrogen in sample of manure in mixture in small weight bottle.

II. Estimate the percentage of crude fibre in sample of feeding stuff in large weight bottle.

III (a) Prepare a normal solution of potassium chloride.

(b) Shake 100 grams of given soil with 250 c. c. of above solution for an hour in the shaking machine, and estimate the lime in 50 c. c. of the filtrate. Discuss the results of your experiment.

Agricultural Chemistry—Practical.

22nd April 1926.]

Paper II.

[10 A. M. to 4 P. M.]

Note:—Previous day's unfinished work, if any should be completed.

I. (a) Solution in flask is a solution of sucrose. Determine its strength.

(b) Add 5 c. c. of given acid to 200 c. c. of the sugar solution and report upon the progress of inversion at the end of $\frac{1}{2}$ hour, one hour and two hours at room temperature.

II. Liquid in bottle is a sample of well water used for irrigation of a tobacco crop. Estimate the quantity of nitrogen present in parts per 100,000. Calculate the amount of nitrogen supplied per acre, if the irrigation water applied during the period of growth of the crop is equivalent to 5 inches of rain fall.

III. Oral Examination.

Agriculture—Practical.

23rd April 1926]

Paper I (Dairying)

[Begin 5-30 A. M.]

1. Prepare butter from the quantity of cream given.
2. Prepare the butter worker and other utensils to receive the butter.
3. Test the sample of milk given for butter fat.
4. Fit up the Separator and operate it.
5. Oral Examination.

General Agriculture.

24th April 1926.]

Paper II

[Begin 6-30 A. M.]

1. Fit up a Gorru, set it to suit the crop for which it is intended and work it in the plot allotted. Cover the above plot with a Guntaka.

2. In a plot given, form with a plough the main irrigation channels required to irrigate a crop of Chitrai Cholam.

3. Fit up the parts of a junior hoe and fit it in a position to work it in the field.

4. Oral Examination.

EDITORIAL NOTES.

Coimbatore Betel Vine Station—Vellalur. The Betel Vine is an important crop in South India and is grown scattered in most districts of the Presidency. It is a delicate crop requiring ample shade and moisture and is cultivated with special care by different classes of skilled betel-vine growers. Owing to the nature of the crop and the intensive cultivation necessary which extends over the whole period of its growth it is planted only in small areas in any one locality. Nellimarla in Vizagapatam, Dra'sharama in Godaveri, Nellikuppam in South Arcot, Ayyampet in Tanjore, Singanallur in Coimbatore, are the most important centres, not to mention isolated plots in practically all other districts. The importance of this crop will be evident from the fact that during the past 30 years during which parcel traffic has become more brisk than ever before, baskets and baskets of green leaves are railed to places as distant as Agra, Allahabad, Cawnpore, Lucknow, both through the eastern and western arteries of the Railway system, to be sold at what would be considered fabulous prices in the centres of production. Rolls of single leaves encasing arecanut powder, spices, and chunam are sold under the name of 'paun' at one pice per roll.