

නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
 இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம் இலங்கைப் பரීட்சைத் திணைக்களம்
 Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
 கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
 General Certificate of Education (Adv. Level) Examination, 2020

කෘෂි විද්‍යාව II
 விவசாய விஞ்ஞானம் II
 Agricultural Science II

08 E II

පැය තුනයි
 மூன்று மணித்தியாலம்
 Three hours

අමතර කියවීමේ කාලය - මිනිත්තු 10 යි
 மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
 Additional Reading Time - 10 minutes

Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Index No. :

Instructions:

- * This question paper consists of 10 questions in 11 pages.
- * This question paper comprises Part A and Part B. The time allotted for both parts is three hours.

PART A — Structured Essay (Pages 2 - 9)

- * Answer all questions on this paper itself.
- * Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and extensive answers are not expected.

PART B — Essay (Page 10 - 11)

- * Answer four questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, tie the two parts together so that Part A is on the top of Part B before handing over to the supervisor.
- * You are permitted to remove only Part B of the question paper from the Examination Hall.

For Examiners' Use only

(08) Agricultural Science - II		
Part	Question No.	Marks
A	1	
	2	
	3	
	4	
B	5	
	6	
	7	
	8	
	9	
	10	
Total		

Total	
In Numbers	
In Letters	
Code Numbers	
Marking Examiner 1	
Marking Examiner 2	
Marks checked by	
Supervised by	

Part A - Structured Essay*Answer all questions on this paper itself.**(Each question carries 100 marks.)*Do not
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column

1. (A) Recent COVID - 19 pandemic has created many issues with respect to food security. State **two** policy decisions taken by the Sri Lankan government to face these issues.

(i)

(ii)

(B) Wind is an important climatic factor which affects the performance of vegetative and reproductive phases in many agricultural crops.

(i) List **two** advantages of the mild wind to the crops.

(1)

(2)

(ii) List **two** disadvantages of the strong wind to the crops.

(1)

(2)

(C) Soil health is an assessment of how well soil performs all of its functions at present and how those functions are being preserved for future use.

(i) State **two** physical properties of soil that help to make a healthy soil.

(1)

(2)

(ii) State **two** essential features of a soil to be considered as a healthy soil.

(1)

(2)

(D) Acidity or alkalinity in soil is known as soil reaction.

(i) State **two** reasons for soils to become acidic.

(1)

(2)

(ii) Name a metal ion that is commonly available in an acidic soil.

.....

(iii) Name a substance that can be used to lower the acidity level in soils.

.....

(E) A nursery is a place where plants are propagated and grown to a desired age that they are ready to be transplanted in the field.

(i) State **two** advantages of rearing plants in the nurseries before establishing them in the field.

(1)

(2)

(ii) State **two** low-cost methods that can be used for sterilization of nursery soils.

(1)

(2)

[see page three]

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- (F) A pigeon pea crop having the root zone depth of 60 cm is grown in a soil with bulk density of 1.2 gcm^{-3} . The soil moisture content at the time of irrigation was 15%. If the moisture content of the soil at its field capacity is 32%, calculate the net irrigation requirement of the crop.

.....

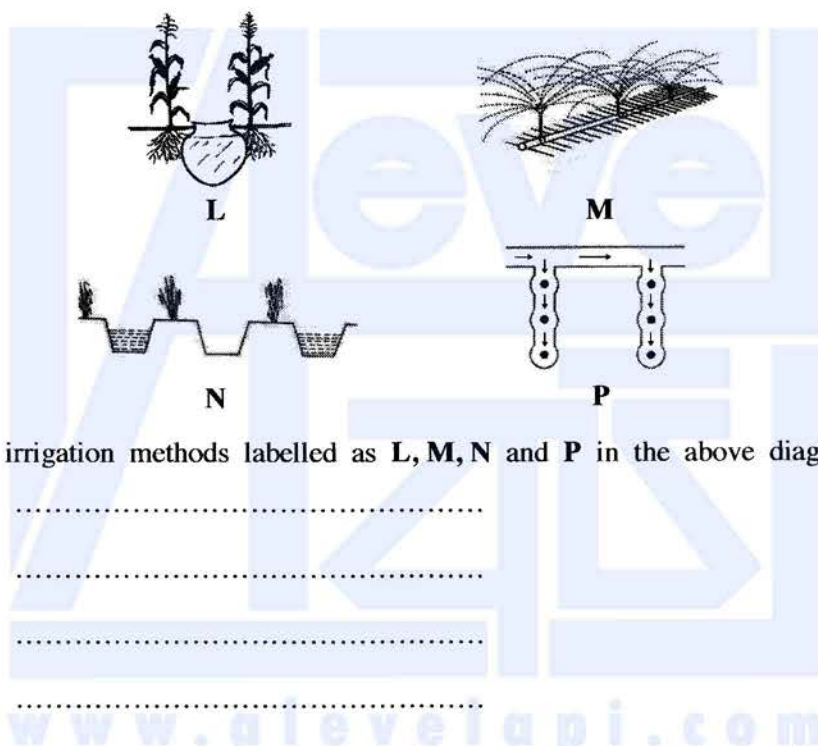
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.....

- (G) Based on the crop water requirement, climatic factors, type of the soil and availability of irrigation water, farmers use different irrigation methods to irrigate their crops. Use the following diagrams to answer questions (i) to (iv).



Name the irrigation methods labelled as **L, M, N** and **P** in the above diagrams.

- (i) **L**
- (ii) **M**
- (iii) **N**
- (iv) **P**

- (H) Poor drainage in agricultural lands leads to reduce the agricultural productivity. State **two** main reasons for poor drainage in crop fields.

- (i)
- (ii)

2. (A) Natural vegetative propagation occurs when an axillary bud grows into a lateral shoot and develops its own adventitious roots.

Name the propagule occur naturally in each of the following crops.

Crop	Name of the natural vegetative propagule
(i) Onion	
(ii) Mint	
(iii) Ginger	

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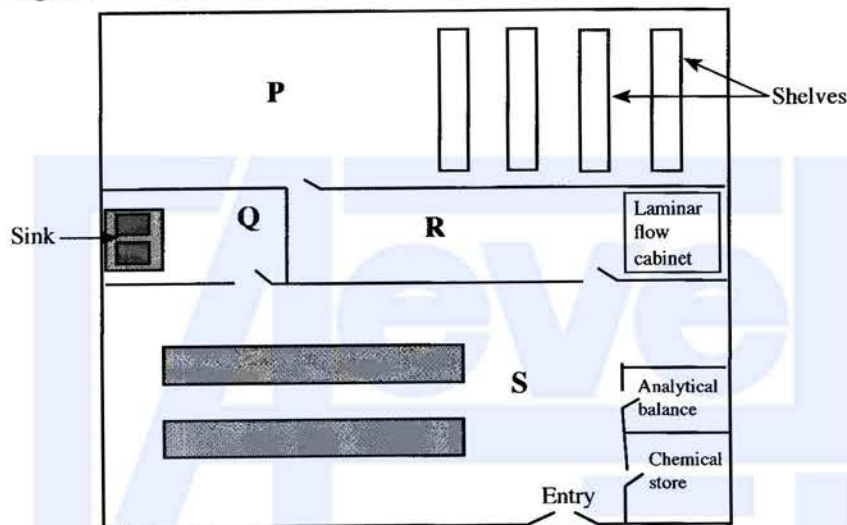
[see page four]

- (B) Seed dormancy is an evolutionary adaptation that prevents seeds from germinating during unsuitable ecological conditions.
State a suitable seed treatment method each for removing seed dormancy of the following crops.

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Crop	Seed treatment method
(i) Winged bean	
(ii) Mango	
(iii) Teak	

- (C) Following diagram shows a sketch of a tissue culture laboratory.
Use this diagram to answer questions from (i) to (iv).



Name sections labelled as **P**, **Q**, **R** and **S** in the above diagram.

- (i) **P**
- (ii) **Q**
- (iii) **R**
- (iv) **S**

- (D) Fertilizer application has both beneficial and detrimental effects to the crop as well as to the environment.

- (i) State **two** detrimental effects of **improper** use of chemical fertilizer on crops.

- (1)
- (2)

- (ii) State **two** detrimental effects of **improper** use of chemical fertilizer on environment.

- (1)
- (2)

- (iii) State **two** practices that can be followed to increase the fertilizer use efficiency.

- (1)
- (2)

[see page five]

- (E) A commercial farmer having three potato fields cultivated same cultivar in all three fields and provided more or less similar conditions to all fields except the spacing between plants. Just before the crop maturity, he randomly measured the total leaf area of approximately one square meter quadrat from each field. Then he harvested the crop and measured the potato yield in each field. The data is as follows.

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Field	Area of the quadrat (m ²)	Total leaf area in the quadrat (m ²)	Potato yield (kg/ha)
P	1.2	2.88	12 500
Q	1.8	11.52	17 250
R	1.3	5.85	32 750

- (i) Calculate the Leaf Area Index (LAI) in each field.

(1) Field P

.....

(2) Field Q

.....

(3) Field R

.....

- (ii) State the reason why field 'R' has given the highest yield.

.....

- (F) According to the Medical Research Institute, about 18% of the population in Sri Lanka suffers from goitre condition.

(i) What is the main cause of goitre condition?

.....

(ii) Name **two** food items that could prevent formation of goitre.

(1)
 (2)

[see page six

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(G) Selection is considered as the oldest plant breeding method.

State **two** main differences between pure line selection and mass selection.

(i)

(ii)

3. (A) Average values for growth and Feed Conversion Ratio (FCR) in broiler production are given below.

Age of birds (Days)	Weight of birds (g)	FCR
0 - 21	900 g	1.42
21 - 43	2 300 g	1.85

(i) Calculate the broiler starter feed requirement per bird.

.....
.....
.....
.....

(ii) Calculate the broiler finisher feed requirement per bird.

.....
.....
.....
.....

(iii) If the feed wastage in the farm is 10%, calculate the total amount of broiler starter and broiler finisher feed required to be purchased for a farm having 100 birds.

(1) Amount of starter feed required (kg)

.....
.....
.....
.....

(2) Amount of finisher feed required (kg)

.....
.....
.....
.....

(B) Poultry management is one of the most common livestock management practices in Sri Lanka.

(i) List **two** main characteristics of a good litter in the deep litter poultry house.

(1)

(2)

(ii) State **two** main advantages of intensive poultry production.

(1)

(2)

[see page seven]

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(C) Artificial Insemination (AI) is the process of collecting sperm cells from a male animal and manually depositing them into the reproductive tract of a female animal.

(i) State the importance of diluting the collected semen before insemination.

.....

(ii) Name a media used to dilute the semen.

.....

(iii) What is the technique used in artificial insemination of cows?

.....

(D) Crossbreeding is used to improve the livestock productivity. State one recommended cattle breed to be used in crossbreeding with local cattle for each of the following agro-climatic zones.

Agro-climatic zone

Recommended cattle breed for crossbreeding

(i) Dry zone

.....

(ii) Up country

.....

(iii) Low country wet zone

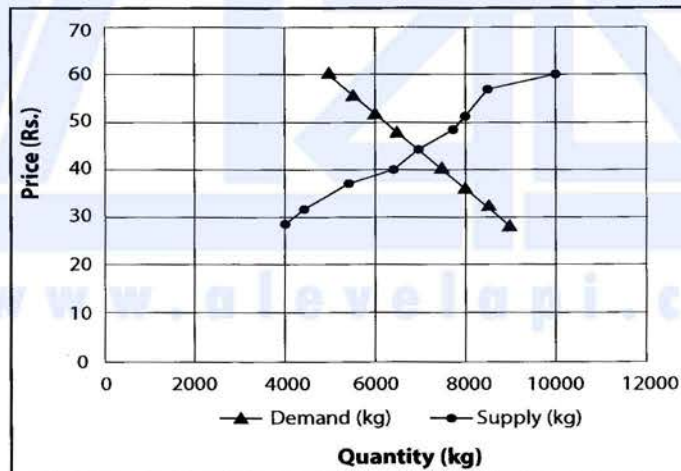
.....

(E) The structures which facilitate propagation of plants are called propagation structures. State **two** instances of using temporary propagation structures in crop production.

(i)

(ii)

(F) The following diagram describes the demand and supply of paddy with respect to the price of the paddy. Use this diagram to answer questions from (i) to (iv).



(i) What is the equilibrium price and the quantity in perfect competitive market condition?

(1) Equilibrium price

(2) Equilibrium quantity

(ii) If the government imposes a guaranteed price of 50 rupees per kg of paddy, what will be the demand and supply?

(1) Demand

(2) Supply

(iii) What should be the role of the government under the condition given in (ii) above ?

.....

[see page eight]

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- (iv) If the government decides to execute the fertilizer subsidy scheme for rice cultivation, how will it affect the demand and supply curves?

- (1) Effect on demand curve
- (2) Effect on supply curve

- (G) Various chains operate to deliver the agricultural products from the producer to the consumer.

- (i) State the main difference between supply chain and value chain.

.....

.....

- (ii) State **two** main advantages of value chain.

- (1)
- (2)

100

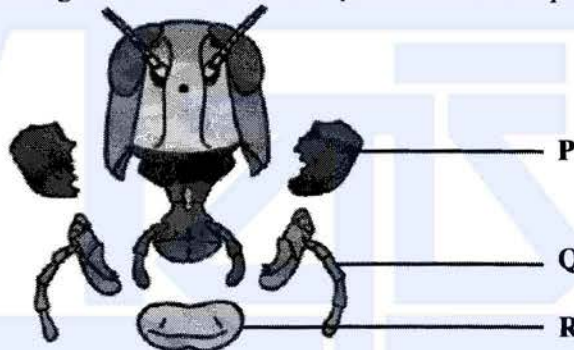
4. (A) Urban farming is becoming popular mainly due to scarcity of arable lands.

State **two** main advantages of the use of solid soilless farming techniques in urban agriculture.

- (i)
- (ii)

- (B) Insects have a range of mouth parts, adapted to particular modes of feeding.

Use the following typical diagram of insect mouth parts to answer questions (i) to (iii).



Name the mouth parts labelled as P, Q and R in the above diagram and state the main function of each mouth part.

Name of the mouth part

main function

- (i) P
- (ii) Q
- (iii) R

- (C) Alien invasive weeds are plants **non-native** to an ecosystem, which compete with crops causing economic damages.

- (i) State **two** main adaptations of alien invasive weeds for the survival in **non-native** environments.

- (1)
- (2)

- (ii) Name a common alien invasive weed found in Sri Lanka.

.....

[see page nine]

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column

(D) Disease triangle is an important conceptual model used in plant pathology.

(i) List **three** components of disease triangle.

(1)

(2)

(3)

(ii) State a main use of disease triangle in epidemiology.

.....

(E) Generally, it is believed that eating fruits reduces the risk of chronic diseases.

(i) List **two** major types of fruits categorized based on their ripening pattern.

(1)

(2)

(ii) List **two** fruits having **non-starch** reserves.

(1)

(2)

(F) Mono cropping and multiple cropping are two common cropping systems.

(i) State **two** main disadvantages of mono cropping system.

(1)

(2)

(ii) State **one** main advantage of multiple cropping system.

.....

(iii) State **two** types of multiple cropping system.

(1)

(2)

(G) Those who work in agricultural farms without wearing protective gears may face many difficulties and disease conditions.

(i) Name a common zoonotic disease that could be infected to farmers working in paddy fields in Sri Lanka.

.....

(ii) State an effect of continuous inhaling of flour dusts by a person who is packing rice flour.

.....

(H) Climate change can disrupt food availability, reduce access to food and affect food quality. State **two** methods to minimize the impact of climate change on agricultural productivity.

(i)

(ii)

100

* *

[see page ten]

නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
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 Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka Department of Examinations, Sri Lanka

NEW

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2020
 கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020
 General Certificate of Education (Adv. Level) Examination, 2020

කෘෂි විද්‍යාව II
 விவசாய விஞ்ஞானம் II
 Agricultural Science II

08 E II

Part B - Essay

Instructions:

- * Answer **four** questions only.
- * Give clearly labelled diagrams where necessary.
- (Each question carries **150** marks.)

5. (i) Describe the different sub systems of conservation farming.
 (ii) Describe the positive and negative effects of plantation sector on Sri Lankan agriculture.
 (iii) Describe the **non**-nutrient components found in foods which are important in human nutrition.
6. (i) Describe the contribution of inter-tropical convergence zone for the onset of monsoon rains in Sri Lanka.
 (ii) Explain the effect of external factors on plant respiration.
 (iii) Describe the measures to be taken to minimize the postharvest losses of perishable foods during transporting, storing and marketing.
7. (i) Explain the standard specifications to be maintained in certified seeds in Sri Lanka.
 (ii) Describe different types of cattle sheds with their main advantages and disadvantages.
 (iii) Describe the methods used to enhance the groundwater recharge in agricultural lands.
8. (i) Describe the effects of major soil constituents on crop cultivation.
 (ii) Describe the issues faced by farmers in cultivating crops in protected structures with ways to mitigate such issues.
 (iii) Describe the suitable external and internal characters of an egg selected for incubation.
9. (i) Describe the factors affecting pest population density.
 (ii) Describe the 4R concept in fertilizer application to crop fields.
 (iii) Marketing plan is an integral part of any business plan. Describe the main components of a marketing plan with their significance.

[see page eleven]

10. (i) Describe the methods of controlling non-insect pests in agricultural fields.
- (ii) Explain the **two** major crop establishment techniques with their importance.
- (iii) Complete the following table. Draw marginal cost, average total cost, average variable cost, and average fixed cost curves on the graph paper provided and label them.

Product units	Total fixed cost	Total variable cost	Average fixed cost	Average variable cost	Total cost	Average total cost	Marginal cost
1	20	10					
2	20	20					
3	20	25					
4	20	28					
5	20	30					
6	20	52					
7	20	85					
8	20	120					
9	20	230					
10	20	410					

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