නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

NEW

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2019 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2019 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2019

කෘෂි විද්‍යාව	I
விவசாய விஞ்ஞானம்	I
Agricultural Science	**I**

08 E I

08.08.2019 / 1300 - 1500

පැය දෙකයි
இரண்டு மணித்தியாலம்
Two hours

Instructions:

* *Answer **all** the questions.*
* *Write your **Index Number** in the space provided in the answer sheet.*
* *Instructions are given on the back of the answer sheet. Follow them carefully.*
* *In each of the questions **1** to **50**, pick one of the alternatives from (1), (2), (3), (4), (5) which is **correct** or **most appropriate** and **mark your response on the answer sheet with a cross** (×) on the number of the correct option in accordance with the instructions given on the back of the answer sheet.*

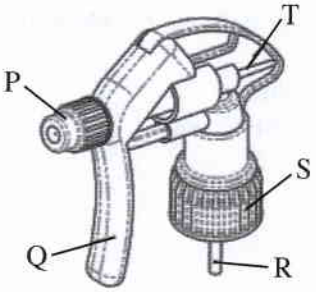
1. Sunshine recorder is mainly used to measure
(1) day length. (2) light quality.
(3) light intensity. (4) light spectrum.
(5) sunshine duration.

2. In plants, the process which increases in the **absence** of light is
(1) ascent of sap. (2) absorption of water.
(3) absorption of CO_2. (4) absorption of minerals.
(5) elongation of internodes.

3. The rate of photosynthesis in plants is higher
(1) in red light. (2) in green light.
(3) in continuous light. (4) when the light intensity is high.
(5) when the ambient temperature is high.

4. Use of methyl eugenol in pheromone traps in mango orchard is recommended to control
(1) Fruit fly. (2) Mealy bug. (3) Leaf miner.
(4) Stem borer. (5) Leaf hopper.

- The following diagram shows a trigger head of a hand sprayer. Use this diagram to answer question No. **5**.



5. In order to change the spray from a jet to a fine mist, the component needs to be adjusted in the above sprayer head, is
(1) P (2) Q (3) R (4) S (5) T

6. The hormone responsible for milk let down in a cow is
(1) Oxytocin. (2) Prolactin. (3) Estrogen.
(4) Progesterone. (5) Gonadotropin.

[*See page two*

7. The main reason for imposing a certified price for paddy by the government of Sri Lanka is to
(1) protect the consumer.
(2) reduce the market competition.
(3) keep extra stocks as a buffer.
(4) stabilize the income of farmers.
(5) maintain the government control over paddy farming.

- Use the following statement to answer question No. **8**.

"When the velocity of river water increases, rocks located on the river bed lift up and bump into other rocks making tiny pieces of the rocks."

8. The process described in the above statement can best be explained as
(1) solution of rocks.
(2) hydration of rocks.
(3) formation of rocks.
(4) physical weathering of rocks.
(5) chemical weathering of rocks.

9. With the destruction of the soil structure,
(1) porosity and bulk density increase.
(2) porosity and bulk density decrease.
(3) particle density and bulk density decrease.
(4) porosity increases while bulk density decreases.
(5) bulk density increases while porosity decreases.

10. An example for bio-fertilizer is
(1) *Fusarium*.
(2) *Azospirillum*.
(3) *Phytophthora*.
(4) *Azadirachta indica*.
(5) *Bacillus thuringiensis*.

11. During the composting process, the C/N ratio of organic materials tends to
(1) decrease.
(2) remain constant.
(3) increase continuously.
(4) first decrease and then increase.
(5) first increase and then remain constant.

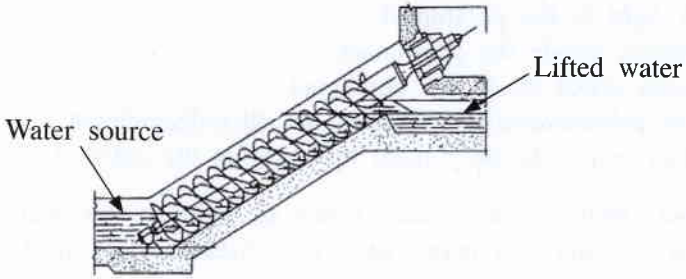
12. A farmer wants to cultivate maize in his sloping land. His intention is to have a good crop establishment through direct seeding while maintaining a minimum soil erosion. The best tillage method for his land would be
(1) zero tillage.
(2) primary tillage.
(3) minimum tillage.
(4) secondary tillage.
(5) conventional tillage.

13. The following are several statements regarding crop establishment.
A - Keeping an equal depth while planting seeds, leads to a uniformly matured crop.
B - Requirement of low seed quantity is an advantage of direct seeding.
C - Labour requirement for weeding can be reduced by planting in rows.
Of above, the correct statement/s would be
(1) A only.
(2) B only.
(3) C only.
(4) A and C only.
(5) B and C only.

14. Artesian well is a
(1) natural and ground water source.
(2) natural and surface water source.
(3) artificial and ground water source.
(4) artificial and surface water source.
(5) natural and geo-thermal water source.

[*See page three*

- Use the following diagram of screw type water lifting device to answer question No. **15**.



15. To lift the water, above device uses
(1) Tension force. (2) Frictional force. (3) Centrifugal force.
(4) Compression force. (5) Gravitational force.

16. An advantage of epigeal germination of seeds is that it provides opportunity
(1) to grow taller. (2) for early flowering.
(3) for early photosynthesis. (4) to protect from early grazing.
(5) to protect from soilborne diseases.

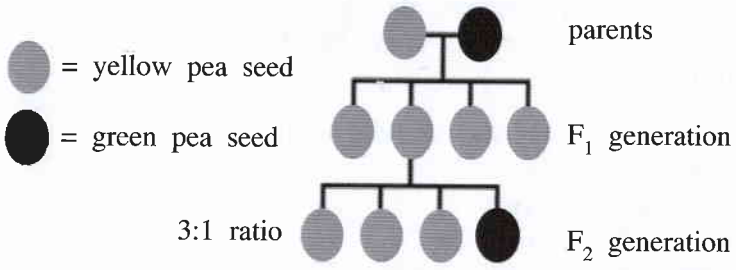
17. A student found a light blue label containing the following information.

Germination percentage	> 85%	Other seeds	< 100/500 g
Weed seeds	5/500 g	Moisture	< 13% (maximum)
Colour / odour / appearance	good	Broken and mechanically damaged seed	100/500 g
Tetrazoliun test	95%	Other colluvials	2%

This label is used for
(1) F_1 seeds. (2) Certified seeds. (3) Breeders' seeds.
(4) Registered seeds. (5) Foundation seeds.

18. A commercial floriculture farmer wants to produce a large stock of disease-free, true to type plants from a sexually sterile hybrid flower plant. The most suitable propagation technique for this would be
(1) micro propagation. (2) clonal propagation.
(3) propagation by F_1 seeds. (4) induction of apomictic seeds.
(5) propagation by embryo culture.

- Use the following diagram to answer question No. **19**.



19. Assuming that both parent plants in the above diagram are homozygous, the reason for the F_1 generation to have yellow phenotypes would be, because
(1) yellow is dominant over green.
(2) the F_1 genotypes are homozygous.
(3) both parents passed on yellow alleles.
(4) expression of green colour is inhibited by yellow.
(5) intra-allelic interaction between yellow and green.

[*See page four*

20. The main purpose of using UV resistant polyethylene in polytunnels is to
(1) prevent entering UV light to the polytunnel.
(2) control the light intensity inside the polytunnel.
(3) enhance the greenhouse effect inside the poytunnel.
(4) extent the lifespan of polyethylene by reducing the photodegradation.
(5) reduce the temperature inside the polytunnel by blocking the entering of shortwaves.

21. A person having a small urban home garden, wants to cultivate his leafy vegetables in an environment free from weeds and soil borne pests and diseases. The most suitable method to cultivate his leafy vegetables would be
(1) Aeroponics. (2) Hydroponics. (3) Hanging pots.
(4) Cultivation bags. (5) Vertical gardening.

22. The conditions needed to develop a plant disease are
(1) susceptible host plant, secondary host plant and pathogen.
(2) virulent strain of the pathogen, disease carrier and susceptible host plant.
(3) susceptible host plant, pathogen and environment favorable to disease development.
(4) susceptible host plant, disease carrier and environment favorable to disease development.
(5) disease carrier, virulent strain of the pathogen and environment favorable to disease development.

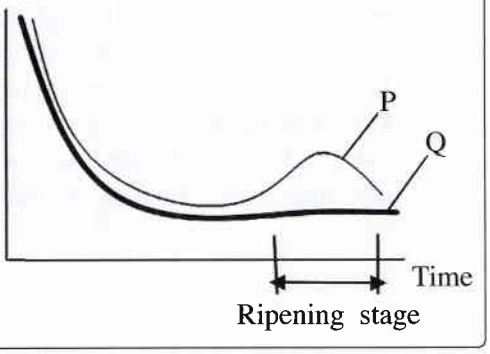
23. 2 - 4 Dichlorophenoxy acetic acid (2 - 4 D) can be classified as
(1) contact and selective weedicide applying to foliage.
(2) long residual and selective weedicide applying to soil.
(3) translocated and selective weedicide applying to foliage.
(4) short residual and non-selective weedicide applying to soil.
(5) translocated and non-selective weedicide applying to foliage.

24. Integrated Pest Management (IPM) aims at
(1) increasing natural enemies of the pest.
(2) improving the host resistance against the pest.
(3) preventing the entering of the pest to the field.
(4) keeping pest populations below injurious levels.
(5) destroying the secondary hosts of the target pest.

25. The main purpose of treating the green leafy vegetables with sodium metabisulphite (SMS) during blanching process is to
(1) preserve the colour. (2) improve the shelf-life.
(3) preserve the nutrients. (4) prevent enzymatic browning.
(5) improve the sodium content.

26. The chemical factors generally use to measure the maturity of fruits are
(1) acid content, specific gravity and texture.
(2) acid content, oil content and specific gravity.
(3) pH value, total soluble solids (TSS) and texture.
(4) pH value, total soluble solids (TSS) and oil content.
(5) total soluble solids (TSS), oil content and ascorbic acid content.

- Use this graph of the rate of respiration during the ripening of different types of fruits to answer question No. **27**.



27. Examples for fruit types P and Q are
(1) citrus and grapes respectively.
(2) apple and banana respectively.
(3) strawberry and pears respectively.
(4) mango and pineapple respectively.
(5) cherry and dragon fruit respectively.

[*See page five*

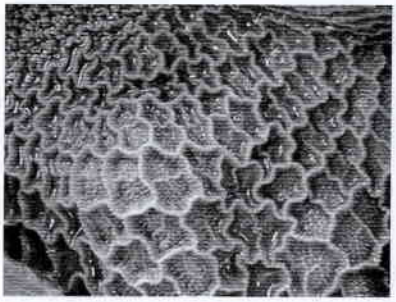
28. Some responses of farm animals to high environmental temperature are listed below.

A - Reduce activity and look for a shade during the mid-day
B - Panting
C - Drink more water and eat less feed
D - Sweating

Of the above, the responses that could be seen in a flock of laying hens in a deep litter house would be

(1) A and B only. (2) A and C only. (3) B and C only.
(4) B and D only. (5) C and D only.

- The following diagram shows the interior appearance of a part of the digestive tract of a cow. Use this diagram to answer question No. **29**.



29. The part of the digestive tract shown in above diagram should be

(1) Rumen. (2) Omasum. (3) Reticulum. (4) Duodenum. (5) Abomasam.

30. The following are some statements on brooding of chicks.

A - Layer type chicks are usually brooded for 4 weeks, but broiler type chicks are brooded only for 2 weeks.
B - Main purpose of brooding chicks is to provide them with warmth as they cannot tolerate environmental temperature.
C - The main reason for not practicing natural brooding in commercial scale is high mortality.
D - Compared to artificial brooding, natural brooding produces chicks that are more tolerable to adverse conditions.

Of the above, the correct statements are

(1) A and B only. (2) B and D only. (3) A, B and C only.
(4) A, B and D only. (5) B, C and D only.

31. A farmer, who cultivate vegetables in his protected house, increases his production. The type of cost which necessarily declines would be

(1) Marginal Cost. (2) Average Total Cost. (3) Average Fixed Cost.
(4) Average Variable Cost. (5) Total Fixed Cost.

32. An environmental benefit of sustainable agriculture would be

(1) ensure food safety.
(2) conservation of soil and water.
(3) ability to maintain economic profitability.
(4) ensure the living standards of future generations.
(5) use of more fossil fuel by lowering the use of electricity.

33. A student met a farmer sitting on the edge of the paddy field. The farmer told the student that he is suffering from dizziness and feeling fainting. The student observed that the farmer having a dry skin, sunken eyes, high heart beat and rapid breathing. The student should immediately

(1) provide shade to the farmer.
(2) provide glucose to the farmer.
(3) take the farmer to a hospital.
(4) provide drinking water to the farmer.
(5) give two tablets of paracetamol to the farmer.

[*See page six*

34. If the climate becomes warmer, sea levels will

A - rise, because water expands when it gets warmer.
B - rise, because of glaciers and ice sheets melting.
C - fall, because hot water evaporates faster.

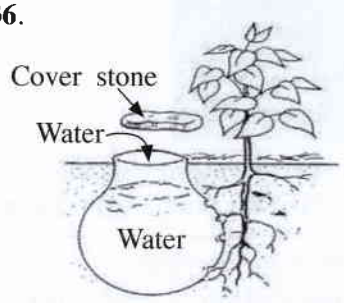
Of the above, the correct statement/s would be

(1) A only. (2) B only. (3) C only.
(4) A and B only. (5) A and C only.

35. Ways of withdrawal of water from the earth are

(1) distillation, run-off and evaporation.
(2) run-off, condensation and infiltration.
(3) evaporation, precipitation and run-off.
(4) evaporation, transpiration and distillation.
(5) infiltration, transpiration and condensation.

- An Agriculture Instructor advises a farmer in the dry zone, to use the irrigation technique shown in the following diagram to irrigate his newly established mango plants. Use this diagram to answer question No. **36**.



36. The most suitable vessel to be used in this irrigation technique would be

(1) glazed old clay pot. (2) glazed new clay pot.
(3) unglazed used clay pot. (4) unglazed new clay pot.
(5) perforated aluminum pot.

37. Tetrahedral and octahedral crystalline structures are the building blocks of clay minerals. Tetrahedral and octahedral sheets are primarily made of

(1) Si & O and Al & O, respectively.
(2) Al & O and Si & O, respectively.
(3) Si & O and Mg & O, respectively.
(4) Fe & O and Mg & O, respectively.
(5) Mg & O and Fe & O, respectively.

38. A student collected following data of a particular soil.

K = 0.32 meq/100 g soil Mg = 0.13 meq/100 g soil Ca = 0.98 meq/100 g soil
Na = 0.02 meq/100 g soil CEC = 5.00 meq/100 g soil

The base saturation of the above soil should be

(1) 6.45 % (2) 7.25 % (3) 14.50 % (4) 29.00 % (5) 64.50 %

39. Following are two statements on Leibig's Law of Minimum.

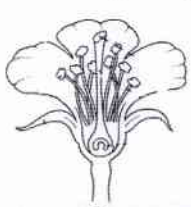
A - Crop yield is determined by the most limiting factor in the field.
B - If only one nutrient is deficient, yield will be limited, even if all other nutrients are adequately available.

Of the above statements,

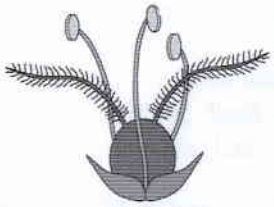
(1) A is correct but B is incorrect.
(2) A is incorrect but B is correct.
(3) Both A and B are correct and A further explains B.
(4) Both A and B are correct and B further explains A.
(5) Both A and B are correct but no any relationship between two.

[*See page seven*

- Use the following diagram to answer question No. **40**.



P



Q

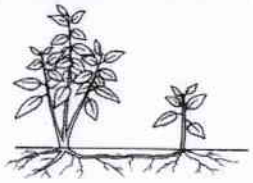
40. Considering the floral structure, flowers P and Q would be pollinated by
(1) wind and water, respectively.
(2) insects and wind, respectively.
(3) wind and insects, respectively.
(4) water and insects, respectively.
(5) insects and water, respectively.

41. The following are some statements regarding malnutrition.
A - Continuous consumption of high fiber food may create micronutrients deficiency.
B - Foods containing high fiber content have a high calorie value.
C - Fibers available in diet control the absorption of micronutrients.
Of the above,
(1) A and B are correct.
(2) B and C are correct.
(3) A is correct and it is further explained by B.
(4) A is correct and it is further explained by C.
(5) B is correct and it is further explained by C.

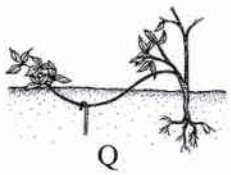
42. The following are some statements regarding animal feeds.
A - Rice polish is a plant-based protein supplement.
B - Maize and soybean meal are plant-based energy supplements.
C - Roughage feeds contain high amounts of fiber and total carbohydrates.
Of the above, the correct statement/s would be
(1) A only. (2) B only. (3) C only.
(4) A and B only. (5) A and C only.

43. Total solids content of cow milk includes
(1) milk fat and lactose only.
(2) milk fat and minerals only.
(3) milk fat and solids nonfat only.
(4) milk fat, milk proteins and lactose only.
(5) milk fat, milk proteins and milk carbohydrates only.

- Use the following diagram to answer question No. **44**.



P



Q

44. The 'P' and 'Q' propagation methods can best be described as
(1) propagation by roots and propagation by cuttings, respectively.
(2) propagation by runners and propagation by cuttings, respectively.
(3) artificial propagation and propagation by ground layering, respectively.
(4) propagation by rhizomes and natural vegetative propagation, respectively.
(5) natural vegetative propagation and artificial vegetative propagation, respectively.

[*See page eight*

45. Examples for bacterial diseases in farm animals are
(1) bird flu, milk fever and tick fever.
(2) raniket, coccidiosis and brucellosis.
(3) mastitis, foot & mouth and salmonellosis.
(4) infectious bronchitis, gamboro and fowl cholera.
(5) hemorrhagic septicemia, brucellosis and mastitis.

46. Following are statements regarding the three stages of a typical production function.
A - In the first production stage, marginal product increases continuously.
B - In the second production stage, both the Marginal Product and Average Product are declining.
C - In the third production stage, the Marginal Product will be negative.
Of the above, the correct statement/s would be
(1) A only. (2) B only. (3) C only.
(4) A and B only. (5) B and C only.

47. Due to unexpected changes in some agricultural output, the respective price changes tend to be high. This could be due to
(1) change in income of the buyers.
(2) change in preference of the buyers.
(3) elastic demand for agricultural products.
(4) inelastic demand for agricultural products.
(5) unitary elastic demand for agricultural products.

48. In a particular market for homogenous goods, there are large number of buyers and sellers. This market structure could be
(1) a perfect competition. (2) an oligopoly.
(3) a wholesale market. (4) a monopoly.
(5) a monopolistic competition.

49. The impact of the recent outbreak of Fall Army Worm on maize in Sri Lanka resulted,
(1) no change in the supply curve of the maize.
(2) the supply curve of the maize shifted to the left.
(3) the supply curve of the maize shifted to the right.
(4) the demand curve of the maize shifted to the left.
(5) the demand curve of the maize shifted to the right.

50. Following are some statements related to organic farming.
A - It reduces human and animal health hazards by reducing the level of residues in the product.
B - It helps in keeping agricultural production at a maximum level and makes it highly profitable.
C - It ensures optimum utilization of natural resources for short-term benefit and helps in conserving them for future generation.
Of the above, the correct statement/s would be
(1) A only. (2) B only. (3) C only.
(4) A and C only. (5) B and C only.

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නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

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

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2019 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2019 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2019

කෘෂි විද්‍යාව II விவசாய விஞ்ஞானம் II **Agricultural Science II**	**08**	**E**	**II**

10.08.2019 / 1300 - 1610

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීම් 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 and decide on the questions that you give priority in answering.

Index No. : .....

Instructions:

* *This question paper consists of* **10** *questions in* **12** *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 - 11)

* *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 12)

* *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	

[see page two

Part A - Structured Essay

*Answer **all** questions **on this paper itself.***

*(Each question carries **100** marks.)*

Do not write in this column

1. (A) Some statements on agricultural meteorology are given below. State whether the following statements are true or false.

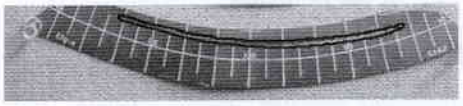
Statement	True/False
(i) Rainfall is expressed and measured as for the past 24 hours.	.....
(ii) Robinson's cup anemometer is used to measure the wind velocity.	.....
(iii) Light mainly affects the plants in four ways viz, intensity, quality, duration and direction.	.....
(iv) Temperature is measured by daily in a weather station in the morning and afternoon.	.....
(v) Cloudy weather increases the incidences of pests and diseases in crops.	.....

(B) Four used sunshine recorder cards are shown in the following diagram. Use this diagram to answer questions (i) to (iii).

Day 1

Day 2

Day 3



Day 4

(i) Which day had the most sunshine?

.....

(ii) Which day was the cloudiest day?

.....

(iii) Which day had the intermittent sunshine?

.....

(C) There are **four subsectors** in agriculture that contribute to the Gross Domestic Product in Sri Lanka. List them.

(i) .....

(ii) .....

(iii) .....

(iv) .....

(D) Soil genesis is very important process for formation and renewal of soils.

(i) Name the **five** main factors that affect soil genesis.

(1) .....

(2) .....

(3) .....

(4) .....

(5) .....

[see page three

0169

Do not write in this column

(ii) State **three** main features of the "O" horizon in a soil profile.

(1) .....

(2) .....

(3) .....

(iii) State **three** main levels of moisture in a field soil.

(1) .....

(2) .....

(3) .....

(iv) Name a suitable method to measure the soil moisture content.

.....

(E) Fill in the blanks in the following paragraph selecting the appropriate word from the following words.

increase, **decrease** and **stay the same**

Due to unfavorable weather in Bandarawela and Welimada areas in December, the price of tomato will immediately ..... due to the ..... in local supply. This will encourage ..... in supply from other tomato growing areas. If the present situation persuades tomato growers to cultivate more in next year and with favorable weather, the next year's supply will ..... and the prices will ..... compared to this year.

(F) Name the **four** factors of production and then classify them as **human** or **physical**.

Factor of production	**Whether human or physical?**
(i)	.....
(ii)	.....
(iii)	.....
(iv)	.....

(G) Write the name of the function / curve that represent each of the following relationships in agricultural production.

(i) Factor-factor relationship : .....

(ii) Factor-product relationship : .....

(iii) Product-product relationship : .....

100

2. (A) Farm animals are fed with various types of feeds in order to support their growth and production.

(i) Name an example for each of following types of feeds.

Type of feed	**Example**
(1) Dry roughage	.....
(2) Protein supplement of plant origin	.....
(3) Energy supplement	.....

[see page four

Do not write in this column

(ii) A Dairy farmer chopped Napier grass into pieces and put them into a pit silo while mixing with rice polish and pressing. Once the pit was filled fully, the contents were again pressed well and covered with a thick polyethylene sheet. Edges of the polyethylene sheet were covered with soil.

State the main reason for each of following activities.

(1) Chopping grass into pieces

.....

(2) Mixing grass with rice polish

.....

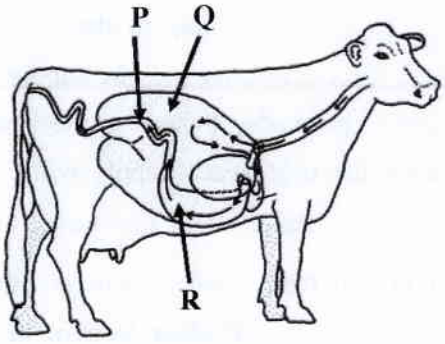
(3) Pressing the contents of the silo

.....

(4) Tightly covering the contents with polyethylene

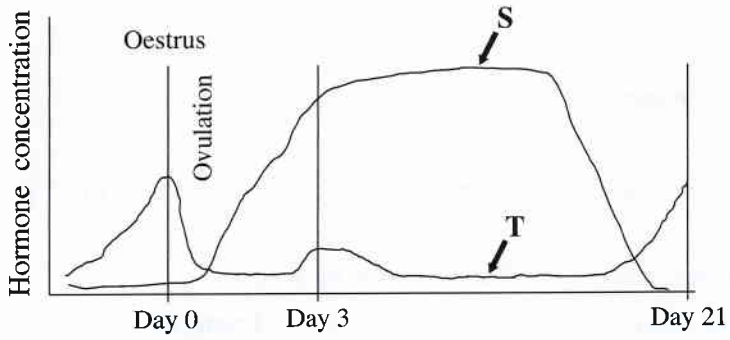
.....

(B) The following diagram shows the digestive system of a cow. Write the specific function of each of the parts labeled as P, Q and R in the diagram.



	Part	Specific function
(i)	**P**	.....
(ii)	**Q**	.....
(iii)	**R**	.....

(C) Following graph shows the changes of hormone concentrations over the time during estrus cycle of a cow. Name the **two** hormones labeled as **S** and **T**.



	Label	Name of the hormone
(i)	**S**	.....
(ii)	**T**	.....

[see page five

0169

Do not write in this column

(D) State **two** advantages of cross breeding compared to selection, in farm animal improvement.

(i) .....

(ii) .....

(E) A poultry farmer added glucose and vitamin B to drinking water prepared for day-old chicks, newly introduced to the brooder. State the main reason for adding each of those substances to drinking water.

(i) Glucose

.....

(ii) Vitamin B

.....

(F) What is the optimum temperature required for the proper growth of the chick embryo?

.....

(G) Plant nutrients are essential for healthy growth of crop plants.

(i) Name **two** groups of plant nutrients categorized based on the amount required.

(1) .....

(2) .....

(ii) Name the **two** methods of nutrients absorption by plants.

(1) .....

(2) .....

(iii) Define "beneficial nutrients" in plants.

.....

.....

(iv) State **two** examples for beneficial nutrients.

(1) .....

(2) .....

(v) State **four** ways of removal of plant nutrients from soil.

(1) .....

(2) .....

(3) .....

(4) .....

(H) Land preparation helps to develop suitable soil environment for crop growth. State **four** physical changes in soils that would take place after land preparation.

(i) .....

(ii) .....

(iii) .....

(iv) .....

[see page six

Do not write in this column

(I) A farmer wants to establish a chilli crop in his land located in low country wet zone. He was advised first to plant the seeds in a nursery and then transplant in the field.

(i) What is the reason to advice him to plant the seeds first in a nursary?

.....

.....

(ii) What is the best type of nursery for him?

.....

(J) It is needed to make the photosynthesis process more efficient in order to obtain higher crop yields.

(i) List **two** practices to improve the photosynthesis in fruit crops.

(1) .....

(2) .....

(ii) Name the **four** factors that might affect the rate of photosynthesis.

(1) .....

(2) .....

(3) .....

(4) .....

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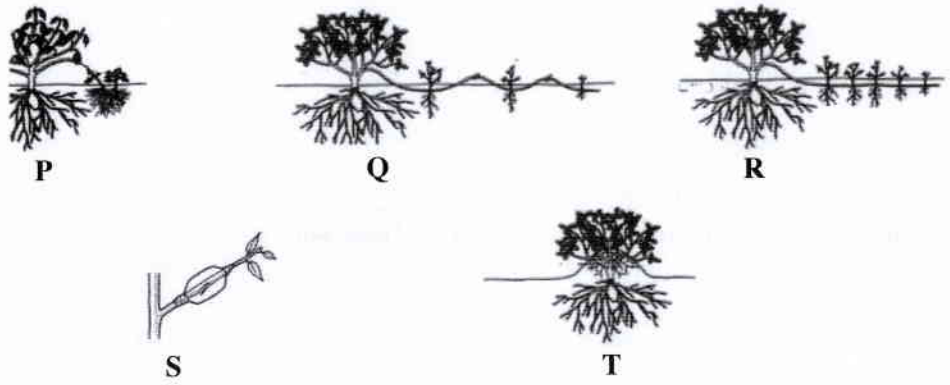
3. (A) Layering is an effective propagation method for some plants that do not root readily from cuttings. Following diagram shows different methods of layering. Use this diagram to answer questions (i) to (v).



Fill the blank with the letter of the relevant line drawing.

Name of the layering method	**Letter of the relevant drawing**
(i) air layering	.....
(ii) trench layering	.....
(iii) mound layering	.....
(iv) serpentine layering	.....
(v) simple ground layering	.....

[see page seven

Do not write in this column

(B) A student wanted to measure the seed germination percentage of a seed lot stored separately in three gunny bags. He took 2–3 random samples from each gunny bag and mix them in a container and three sub-samples were taken. Then 100 seeds were taken from each sub-sample and placed them separately on tissue papers inside a tray and saturated the tissue papers with water.
He frequently checked the tray to see that the tissue papers remain moist and recorded the number of germinated seeds.

(i) Why did he take 2–3 random samples from each gunny bag?

.....

(ii) Why did he mix all randomly taken samples in a container?

.....

(iii) Why did he take three samples from the mixed seeds?

.....

(iv) Ultimately, he recorded following data from three samples.

Sample No.	No. of seeds germinated
1.	85
2.	92
3.	87

Calculate the germination percentage of the seed lot.

.....

.....

.....

(C) Tissue culture is commonly used to propagate plants in large scale commercial nurseries. State the main purpose of adding each of the following ingredients to a tissue culture media.

Ingredient	Purpose
(i) Inorganic nutrients	.....
(ii) Energy source	.....
(iii) Carbon materials	.....
(iv) Growth regulators	.....
(v) Gelling agents	.....

(D) Use of healthy and viable seeds as the planting material is important for good crop establishment.

(i) State a technique to measure the viability of dormant seeds.

.....

(ii) State a main advantage and a disadvantage of seed dormancy.

Advantage

.....

Disadvantage

.....

[see page eight

Do not write in this column

(E) Ancient Sri Lankans had a very good knowledge on water resource management and they used different techniques to increase the groundwater recharge.

(i) List **two** techniques used by the ancient Sri Lankans to increase groundwater recharge.

(1) .....

(2) .....

(ii) State a main importance of recharging groundwater.

.....

(F) A farmer cultivated his lowland with a Capsicum crop during the dry season. During the flowering stage of the crop, unusual heavy rains were experienced. A few days after the rains, farmer observed that leaves of Capsicum plants have become yellow and he smelled hydrogen sulfide coming out from the field.

(i) What is the reason for this situation?

.....

(ii) State a method to rectify this situation.

.....

(iii) Name a crop that can adopt to above situation.

.....

(G) A student recorded following data in a clay loam soil

Water content at saturation = 40 cm/meter
Available water content = 13.4 cm/meter
Water content at permanent wilting point = 16.7 cm/meter

(i) Calculate the water content at the field capacity.

.....

.....

.....

(ii) Calculate the amount of gravitational water.

.....

.....

.....

(iii) What is the amount of unavailable water content in this soil?

.....

(H) Many natural resources are used in different farming systems.

(i) Name **three** main groups of natural resources used in agriculture.

(1) .....

(2) .....

(3) .....

(ii) State **two** special features of rainfed farming system.

(1) .....

(2) .....

[see page nine

Do not write in this column

(iii) What is 'bio-dynamic farming'?

.....

.....

.....

(iv) What is the main difference between bio-dynamic farming and organic farming?

.....

.....

(I) Postharvest losses in foods take place at different stages of postharvest handling.

(i) State **two** precautions need to be taken to minimize the postharvest losses of fruits and vegetables during transport.

(1) .....

(2) .....

(ii) Write **two** consequences of postharvest losses of foods.

(1) .....

(2) .....

(iii) State a method to convert perishable foods to non-perishable foods.

.....

(J) Farmers suffer from increased rates of respiratory diseases, noise-induced hearing loss, skin disorders, cancers, chemical toxicity and heat-related illnesses. State a main cause for each of the following health hazards of farmers.

Health hazard	**Cause**
(i) Respiratory diseases	.....
(ii) Noise-induced hearing loss	.....
(iii) Skin disorders	.....
(iv) Cancers	.....

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4. (A) Conservation of genetic resources is essential to maintain the biodiversity.

(i) Define *in-situ* conservation and *ex-situ* conservation

***In-situ* conservation**

.....

.....

.....

***Ex-situ* conservation**

.....

.....

.....

(ii) State an example for each of the following found in Sri Lanka.

(1) *In-situ* conservation site .....

(2) *Ex-situ* conservation site .....

[see page ten

Do not write in this column

(B) Protected structures are used to control soil and aerial environments to obtain higher crop production.

(i) State the purpose of the use of temporary protected structures for certain crop species during their certain stages of growth.

.....

(ii) State the importance of greenhouse effect inside the protected structures established in upcountry area.

.....

(C) Soilless culture is commonly used to cultivate high value crops in modern intensive agriculture.

(i) State the **three** main categories of soilless culture methods.

(1) .....

(2) .....

(3) .....

(ii) Write the main advantage of soilless culture.

.....

(D) State whether following statements related to pest management are **true** or **false**.

Statement	**True/False**
(i) Insects in the orders Coleoptera and Lepidopetra are major pests of stored grain.	.....
(ii) Mass trapping is an **ineffective** control strategy at low pest densities.	.....
(iii) Clean cultivation and crop rotation are two examples of biological control of pests.	.....

(E) It is necessary to take special care in handling pesticides.

(i) State **two** important precautions need to be taken in storing pesticides.

(1) .....

(2) .....

(ii) Write **two** activities one **should not do** while applying the pesticides.

(1) .....

(2) .....

(iii) Why it is important to keep remaining pesticides in the original containers?

.....

(F) Weeds may cause a number of issues and may restrict the growth of crop plants. Hence, it is important to control weeds.

(i) What is a weed?

.....

.....

[see page eleven

Do not write in this column

(ii) State the **three** type of weeds according to their habitats and write an example for each type.

	Type	**Example**
(1)	.....	.....
(2)	.....	.....
(3)	.....	.....

(G) It is recorded that 16% of the global crop loss is due to plant diseases.

(i) List the **three** main types of microbial disease causal agents.

(1) .....

(2) .....

(3) .....

(ii) State **two** abiotic factors that cause plant diseases.

(1) .....

(2) .....

(H) Completely sealed, opaque glass or plastic containers are recommended to use as packaging materials for vegetable oils. State **two** reasons for this recommendation.

(i) .....

(ii) .....

(I) **Non-nutrient** constituents available in human diet are also play a crucial role to maintain the good health. Name **two non-nutrient** constituents found in human diet.

(i) .....

(ii) .....

(J) Diversified foods have many advantages as well as disadvantages.

(i) State one main advantage of diversified foods.

.....

(ii) State one main disadvantage of diversified foods.

.....

(K) Use the following statement to answer questions (i) and (ii).

"Avoid applying any pesticides to plants that are flowering, particularly insecticides. Also avoid pesticide drift to nearby blooming plants, including weeds."

(i) Why pesticides should **not** be applied to plants in flowering?

.....

(ii) Why it is necessary to avoid pesticide drift to nearby flowering plants including weeds?

.....

100

* *

[see page twelve

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2019 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2019 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2019

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 pre-harvest factors responsible for post-harvest losses in crops.

(ii) Describe the agricultural uses of plant growth regulators.

(iii) Explain the importance of identifying Agro-ecological zones in Sri Lanka.

6. (i) Describe the different methods of removing seed dormancy.

(ii) Describe the measures that have been taken by the government to uplift the Agriculture sector in Sri Lanka.

(iii) Describe the importance of pasture conservation in Sri Lanka.

7. (i) Explain the importance of soil bulk density and porosity for crop growth and water movements in soil.

(ii) Describe the importance of using protected structures to face the challenges of climate change.

(iii) Describe the advantages and disadvantages of different methods of poultry rearing.

8. (i) Explain the factors affecting the supply of agricultural products.

(ii) Describe the impact of alien and invasive weeds to the agricultural production in Sri Lanka.

(iii) Describe the importance of applying organic manure into crop fields.

9. (i) Describe the disease triangle explaining the impact of each factor on disease spread.

(ii) Describe various nursery techniques commonly used in Sri Lanka.

(iii) Describe With examples, the value chains and supply chains found in Sri Lankan agriculture.

10. (i) Explain the factors to be considered in selecting a water source for irrigation.

(ii) Explain the importance of 'Hazard Analysis of Critical Control Point (HACCP)' as a quality management system.

(iii) Describe the role of mixed cropping to maintain the food security.

* * *