සියලු ම හිමිකම් ඇවිරිණි/முழுப் பதிப்புரிமையுடையது/All Rights Reserved]

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம் 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

ජෛවපද්ධති තාක්ෂණවේදය I
உயிர்முறைமைகள் தொழினுட்பவியல் I
Biosystems Technology I

66 E I

07.08.2019 / 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** (×) in accordance with the instructions given at the back of the answer sheet.*
* ***Use of calculators is not allowed.***

1. The most commonly practiced method for root induction in plants is
(1) cutting. (2) budding. (3) grafting. (4) layering. (5) transplanting.

● Use following diagram to answer the question No. **2**.

2. The flower plant shown in above diagram is
(1) Vanda. (2) Cattleya. (3) Oncidium. (4) Dendrobium. (5) Phalaenopsis.

3. In an edible landscaping, student wanted to select a suitable plant for a shaded area in his home garden. The most suitable plant would be
(1) Fig. (2) Ginger. (3) Tomato. (4) Dracaena. (5) Snake gourd.

4. The most common soil type found in dry zone of Sri Lanka is
(1) Laterite soil.
(2) Alluvial soil.
(3) Low Humic Gley soil.
(4) Red Yellow podzolic soil.
(5) Reddish Brown Earth soil.

5. In an automated weather station,
(1) batteries are recharged by wind power.
(2) sensors are kept in the Stevenson screen.
(3) rain gauge is located separately, two meters away from the mast.
(4) main components are data logger, rechargeable battery and sensors.
(5) all the components are kept in a weather resistant fibreglass enclosure.

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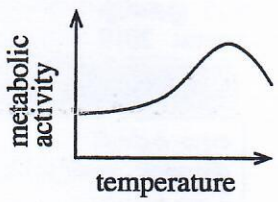
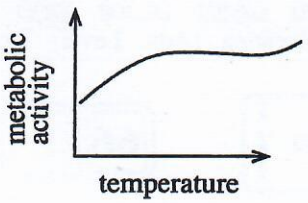
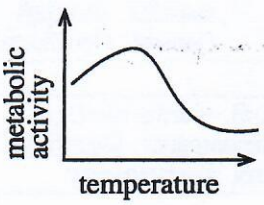
6. From among the following graphs, the variation of metabolic activity of aquatic organisms with the temperature of the water is best explained by



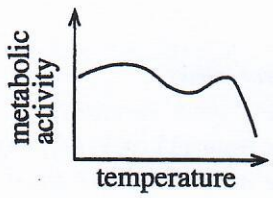
(1)



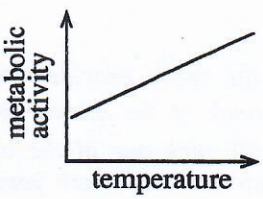
(2)



(3)



(4)



(5)

7. On a 1:10,000 scale map, a student measured the distance between two cities and found the distance is 4.50 cm on the map. The corresponding actual distance between these two cities on the ground should be
(1) 0.045 km. (2) 0.45 km. (3) 4.5 km. (4) 45 km. (5) 450 km.

8. Colloids in soils are important for biosystems because, they
(1) provide paths for gases and support plant respiration.
(2) increase the soil consistency and minimize land degradation.
(3) allow transportation of water and prevent water logging conditions.
(4) adsorbs, hold and release base ions and provide nutrients to the plants.
(5) attract acidic compounds by their positive charges and buffer the soil pH.

9. From among the following statements, the correct statement regarding contours would be
(1) contours may reach each other on a cliff.
(2) very rarely contours may cross one another.
(3) equally spaced contour denotes an uneven slope.
(4) contours at a plain are located close to each other.
(5) contours at a mountain peak are located wide apart.

10. Point source pollution
(1) is difficult to control at the site.
(2) is difficult to be treated by a treatment plant.
(3) depends on the environmental conditions in the area.
(4) is the only pollutant source contributes to eutrophication.
(5) is always related to some production or processing process.

11. A few days before transferring the nursery plants to the field, a farmer gradually reduced the frequency of watering the plants and increased the exposure time to the direct sunlight. This process is called
(1) hardening. (2) adaptation. (3) suberization.
(4) vernalization. (5) transformation.

12. The following are two statements on baseline used in chain surveying.
A - Baseline is the main and longest line, which passes approximately through the centre of the land.
B - Offsets are drawn only from the baseline and they should be perpendicular to the baseline.
Of the above,
(1) both A and B are correct. (2) both A and B are incorrect.
(3) A is correct but B is incorrect. (4) A is incorrect but B is correct.
(5) A is correct and B further explains A.

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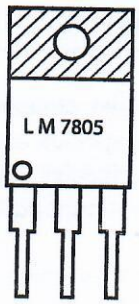
● Use this diagram to answer question No. **13**.

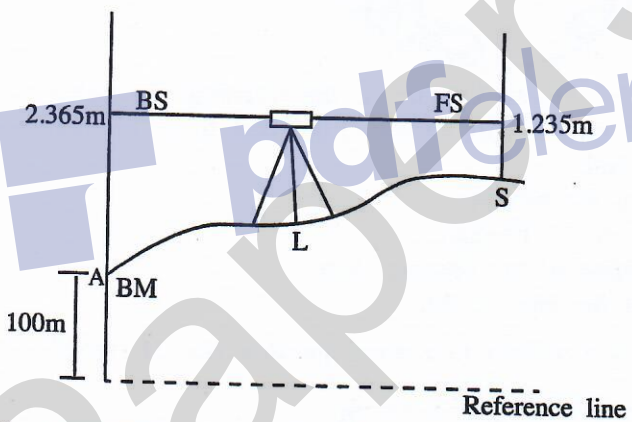



**13.** The electronic component shown in this diagram is
(1) a transistor that can be used as a switch.
(2) a transistor that can be used as an amplifier.
(3) an integrated circuit that can supply –5V output.
(4) an integrated circuit that can supply +5V output.
(5) an integrated circuit that can supply +7V output.

**14.** Most of the sub-merged aquatic plants reproduce by asexual propagation. This is an adaptation to
(1) lack of pollinators.
(2) avoid rotting of seeds.
(3) diffused light in underwater.
(4) avoid washing of flowers by water.
(5) maintain genetic identity of the plants.

**15.** From among the following statements, the correct statement on milk testing would be
(1) lactometer is used to determine the fat content in milk.
(2) somatic cell count in milk can be estimated by strip cup test.
(3) Gerber method is used to measure the specific gravity of milk.
(4) adulteration of milk by starch is indicated by purple colour in the Lima's test.
(5) adulteration of milk by sugar is indicated by red colour when glycerin is added.

● Use following diagram to answer question No. **16**.




**16.** As per the levelling measurements stated in the above diagram, the elevation of the site S should be
(1) 98.87 m. (2) 101.130 m. (3) 101.235 m. (4) 102.365 m. (5) 103.600 m.

**17.** Following are two statements on confined aquifers in Sri Lanka.
A - Confined aquifers are recharged mainly by *Maha* rains.
B - Confined aquifers can supply water at the same rate for a longer duration.
Of the above,
(1) both A and B are correct. (2) both A and B are incorrect.
(3) A is correct but B is incorrect. (4) A is incorrect but B is correct.
(5) A is correct and B further explains A.

**18.** The change of the colour in milk during the sterilization process can be best explained as a reaction between
(1) sugar and amino acids.
(2) amino acids and water.
(3) carbohydrate and peroxidase enzyme.
(4) amino acids and polyphenol oxidase enzyme.
(5) polyphenolic compounds and peroxidase enzyme.

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19. Following are two statements related to the food fish production in Sri Lanka.

A - Fish species are cold-blooded.

B - Fish species convert more food to growth rather than spending energy on maintaining body temperature.

Of the above,

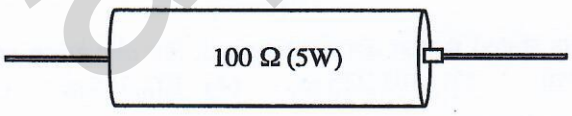
(1) statement A is correct but statement B is incorrect.
(2) statement A is incorrect but statement B is correct.
(3) both statements A and B are correct and B further explains A.
(4) both statements A and B are correct and A further explains B.
(5) both statement A and B are correct but there is no relationship between the two statements.

● Use the following diagram to answer question No. **20**.

20. When a student inspected his chicken brooder in the morning, the behaviour of the chicks was as in the above diagram. To correct this situation, the best thing for him to do is to

(1) switch off the electric bulb.
(2) increase the humidity in the brooder.
(3) improve the ventilation in the brooder.
(4) increase the supply voltage of the electric bulb.
(5) decrease the wattage of the electric bulb.

● Use the following diagram of a resistor to answer question No. **21**. (Assume that the resistor has no defects).




21. It was noted that the above resistor was getting heated up when the circuit was in operation. The most appropriate solution to prevent this situation would be the replacement of the above resistor with

(1) four 25 Ω (5W) resistors in series mode.
(2) two 50 Ω (5W) resistors in series mode.
(3) two 100 Ω (5W) resistors in series mode.
(4) two 200 Ω (5W) resistors in parallel mode.
(5) two 100 Ω (5W) resistors in parallel mode.

22. In a hydroponic system, the reservoir containing the nutrient solution should be fully covered to avoid exposing the nutrient solution to the light. This is done to prevent

(1) excessive root growth.
(2) negative phototropism of roots.
(3) growing of algae in solution.
(4) clogging of nutrients in the solution.
(5) developing chlorophyll on the root surfaces.

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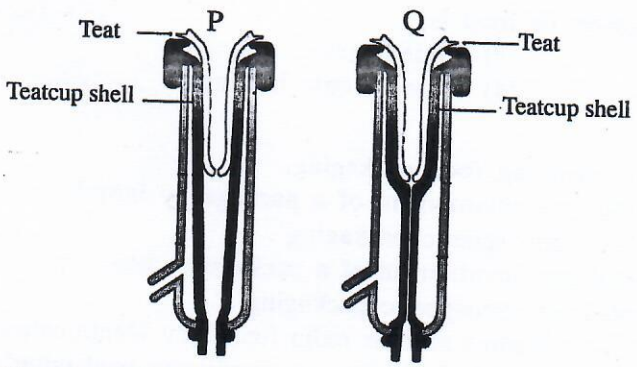
Papers.lk Element

23. Polytunnels are usually covered with Ultra Violet rays (UV) resistant polyethylene. The main reason to use UV resistant polyethylene is to
(1) provide partial shade to the polytunnel.
(2) prevent the UV light entering the polytunnnel.
(3) delay the photodegradation of polyethylene.
(4) lower the temperature inside the polytunnel.
(5) maintain high humidity inside the polytunnel.

● Following diagram shows two steps of a milking machine during the milking. Use this diagram to answer question No. **24**.




24. During the milking by using this machine, milk
(1) comes out during the step P only.
(2) comes out during the step Q only.
(3) comes out during both steps P and Q.
(4) does not come out during both steps P and Q.
(5) mainly comes out during step P and it continues during step Q but at a reduced rate.

● Use the following food additives to answer question numbers **25** and **26**.
A - Sodium nitrate/nitrite
B - Sodium benzoate
C - Potassium sorbate
D - Sodium metabisulphite

25. The food additives affecting the final colour of a food product are
(1) A and B only. (2) A and D only. (3) B and C only.
(4) B and D only. (5) C and D only.

26. The food additives that are widely used in fruits and vegetables processing industry are
(1) A and B only. (2) A and D only. (3) B and C only.
(4) B and D only. (5) C and D only.

27. A sprayer having a tank with 16 litres capacity has been calibrated to apply 8 litres/ha. It is mentioned in the label of the pesticide container to apply 160 ml of the pesticide per ha. The quantity of pesticide needed to add to the sprayer tank is
(1) 80 ml (2) 160 ml (3) 320 ml (4) 160 × 8 ml (5) 160 × 16 ml

28. Following are two statements regarding the flywheel of an engine.
A - A flywheel is a rotating mechanical device that is used to store rotational energy.
B - When the energy source is discontinuous, flywheel converts it into a continuous energy.
Of the above,
(1) statement A is correct but statement B is incorrect.
(2) statement A is incorrect but statement B is correct.
(3) both statements are incorrect as engines do not have flywheels.
(4) both statements are correct but statement B does not explain statement A.
(5) statement A is correct and statement B further explains the use of the flywheel.

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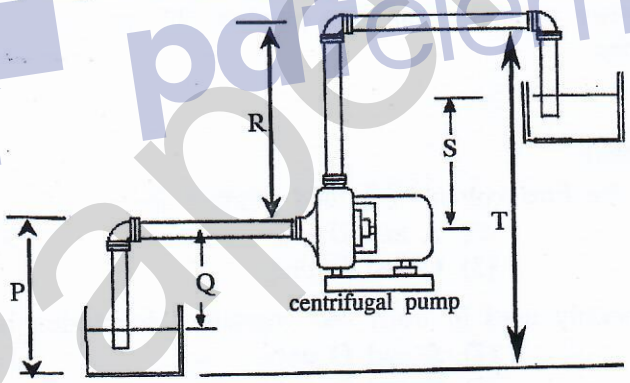
29. Examples for open loop and closed loop control systems are
(1) electric iron and refrigerator, respectively.
(2) electric kettle and ceiling fan, respectively.
(3) ceiling fan and air conditioner, respectively.
(4) air conditioner and electric bulb, respectively.
(5) electric bulb and immersion heater, respectively.

30. An example for cold pasteurization of food is
(1) smoking. (2) fortification.
(3) spray drying. (4) pulse electric heating.
(5) high pressure processing.

31. Following are some statements regarding food packaging.
A - Controlling the internal gas environment of a package by introducing external inert gas is known as 'controlled atmospheric packaging'.
B - Controlling the internal gas environment of a package without introducing external inert gas is known as 'modified atmospheric packaging'.
C - The package consisting indicators such as radio frequency identification sensors to detect the quality of the food materials is known as 'intelligent packaging'.
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.

● Use the following diagram to answer question numbers **32**.




32. As per the above diagram, the suction head of the centrifugal pump should be
(1) P. (2) Q. (3) R. (4) S. (5) T.

33. The most suitable storage conditions for fresh fruits and vegetables are
(1) low temperature, low humidity and low $CO_2/O_2$ ratio.
(2) high temperature, low humidity and low $CO_2/O_2$ ratio.
(3) low temperature, high humidity and low $CO_2/O_2$ ratio.
(4) low temperature, high humidity and high $CO_2/O_2$ ratio.
(5) high temperature, high humidity and high $CO_2/O_2$ ratio.

34. Drip irrigation
(1) leads to unavoidable wetting of foliage in field crops.
(2) is highly sensitive to wind, causing evaporation losses.
(3) without water filters may cause clogging of water emitters.
(4) with saline water (>7 millimhos/cm) cause leaf burning of crop plants.
(5) may increase weed growth in the field as water and nutrients are more efficiently used in the field.

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35. Multimeters are becoming more popular compared to ordinary voltmeters in measuring the voltage differences. The reason for this popularity is
(1) quickness in response.
(2) easiness to connect it into the circuit.
(3) easiness to read the numbers in the display.
(4) ability to measure both current and resistance.
(5) ability to switch into measuring different ranges of voltage.

36. When constructing a farm structure, a farmer needs to use under purlins. The timber to be selected for this purpose should be high in
(1) density. (2) shear strength.
(3) tensile strength. (4) bending strength.
(5) compressive strength.

37. Following are some statements about the function of an impeller in a water pump.
A - Impeller transmits the power from the running fluid to the motor that drives the pump.
B - The velocity achieved by the impeller transfers into pressure.
C - The force generated by the rotation of the impeller move the fluid outwards from the centre.
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.

38. During the white pepper production, citric acid treatment is done to
(1) sort the good quality pepper seeds.
(2) disinfect the surface of the pepper seed.
(3) soften the outer peel of the pepper seeds.
(4) intensify the white colour of the pepper seeds.
(5) avoid the shrinking of the seeds during drying.

39. During the process of cold pressed virgin coconut oil extraction,
A - slow heating at low temperature is done to separate the oil.
B - extracted coconut milk is kept in the refrigerator to separate water and coconut cream.
C - coconut cream is kept at room temperature to separate virgin oil from the curd.
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.

40. An example for a component that can be connected to a circuit without identifying their terminal connections is
(1) diode. (2) transformer. (3) relay switch.
(4) electrolytic capacitor. (5) light dependent resistor.

41. Following are some statements about equipment used in land preparation.
A - Subsoil plough is used to break the surface crust in hard clayey soil.
B - Moldboard plough is more suitable for rocky lands.
C - Disc plough can be used in muddy and sticky soils.
Of the above, correct statement/s would be
(1) A only. (2) B only. (3) C only. (4) A and B only. (5) B and C only.

42. Provision of intervals during the work shifts in a food processing factory can be identified as
(1) prevention of psychosocial hazards.
(2) engineering control of biological hazards.
(3) engineering control of ergonomic hazards.
(4) administrative control of biological hazards.
(5) administrative control of ergonomic hazards.

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Papers.lk element

**43.** Following are two statements regarding measuring the girth of a standing tree.

A - Internationally accepted breast height is 1.3 m.

B - Girth of a standing tree is measured at breast height to minimize the errors occur due to buttresses.

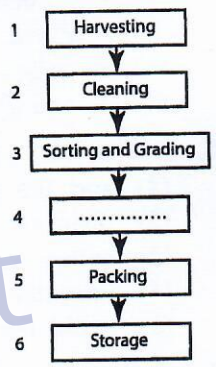
Of the above

(1) A is correct but B is incorrect.
(2) A is incorrect but B is correct.
(3) both are correct and B further explains A.
(4) both are correct and A further explains B.
(5) both are correct but there is no relationship between the two statements.

**44.** The correct order of transmitting a signal through components in an automatic control system would be,

(1) sensor → ALU → actuator.
(2) memory → register → ALU.
(3) memory → processor → ALU.
(4) sensor → register → actuator.
(5) sensor → processor → actuator.

● Postharvest management process of cut flowers is given in this flowchart.




Use this flowchart to answer question No. **45**.

**45.** The activity to be performed under step 4 in the above flowchart would be

(1) making flower arrangements.
(2) discarding low quality flowers.
(3) washing flowers with running water.
(4) wrapping flowers with tissue papers.
(5) dipping petioles of flowers in vinegar solution.

**46.** In implementing a landscape design, the first to be established should be

(1) statues.
(2) hedges.
(3) pathways.
(4) large trees.
(5) interlock paving.

**47.** Renewable energy has many advantages over traditional fuel energy. However, the main drawback of the renewable energy production is

(1) high initial cost.
(2) limited availability.
(3) lack of technology.
(4) geographic limitations.
(5) depletion of renewable energy sources.

**48.** The use of either naturally occurring or deliberately introduced microorganisms to break down environmental pollutants, in order to clean a polluted site is called

(1) bioremediation.
(2) mold remediation
(3) nano remediation
(4) micro remediation
(5) photo remediation.

**49.** The most appropriate way to obtain energy security for Sri Lanka is through the use of

(1) natural gas.
(2) solar power.
(3) dendro power.
(4) urban agriculture.
(5) edible landscaping.

**50.** A newly passed out young management graduate wishes to establish a commercial plant nursery for export market. According to the SWOT analysis,

(1) her young age and management degree can be considered as a strength and an opportunity respectively.
(2) her young age and lack of management skills can be considered as a strength and a weakness respectively.
(3) her degree and lack of experience in agri-business can be considered as a strength and a weakness respectively.
(4) lack of market avenues for export market and difficulty to find quality planting materials can be considered as a weakness and a threat respectively.
(5) her lack of knowledge in agriculture and lack of practical experience in running a business can be considered as a weakness and a threat respectively.

* * *

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සියලු ම හිමිකම් ඇවිරිණි/முழுப் பதிப்புரிமையுடையது/All Rights Reserved]

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව 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

ජෛවපද්ධති තාක්ෂණවේදය II
உயிர்முறைமைகள் தொழினுட்பவியல் II
Biosystems Technology II

66 E II

09.08.2019 / 1400 – 1710

පැය තුනයි
மூன்று மணித்தியாலம்
*Three hours*

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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 comprises of **two** parts, Part **A** and Part **B**. The time allotted for **both parts** is **three hours**.*

**PART A — Structured Essay : ( pages 2 - 8)**

*Answer **all four** 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 that extensive answers are not expected.*

**PART B — Essay : ( pages 9)**

* *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 top of Part **B** before handing them over to the Supervisor.*
* *You are permitted to remove only Part **B** of the question paper from the Examination Hall.*

**For Examiner's Use Only**

| Part | Question Nos. | Marks Awarded |
|---|---|---|
| A | 1 | |
| | 2 | |
| | 3 | |
| | 4 | |
| B | 5 | |
| | 6 | |
| | 7 | |
| | 8 | |
| | 9 | |
| | 10 | |
| Total | | |

**Total Marks**

| | |
|---|---|
| In numbers | |
| In words | |

**Code Numbers**

| | |
|---|---|
| Marking Examiner 1 | |
| Marking Examiner 2 | |
| Marks checked by | |
| Supervised by | |

[see page two

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**PART A — Structured Essay**

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

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1. (A) Weather station provides important information to manage biosystems effectively and efficiently.

(i) Name **two** instruments need to be located in Stevenson screen.

(1) .....

(2) .....

(ii) State the installation height of the anemometer from the earth.

.....

(B) Budding and grafting are popular vegetative propagation techniques used in agriculture.

(i) What is the most important factor for a successful budding or grafting between compatible stock and scion?

.....

(ii) State **two** main factors to be considered in selecting a stock.

(1) .....

(2) .....

(iii) Why budding or grafting is **not** successful in monocots?

.....

.....

(C) A group of students came to know that the biogas unit at the school produces biogas more than the requirement. Furthermore, it is observed that the storage tank is not sufficient to store excess biogas. As a solution, one student named Kamal proposed to release the biogas to environment by opening the releasing valve. But another student named Chathura opposed and suggested to burn the extra biogas instead of releasing to the environment.

(i) With whom do you agree? Kamal or Chatura?

.....

(ii) State the reason for your answer.

.....

.....

(D) Urban agriculture is becoming popular among health-conscious middle-class community.

(i) State **two** main reasons for the popularity of urban agriculture in Sri Lanka.

(1) .....

(2) .....

(ii) Name an organic pesticide that could be prepared at home and use in urban home gardens.

.....

(iii) List **two** advantages of edible landscaping.

(1) .....

(2) .....

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(E) Consumption of spoiled foods creates serious health issues to the human.

(i) State **two** physical factors causing food spoilage.

(1) .....

(2) .....

(ii) What is autoxidation?

.....

(iii) Name a technique used to prevent autoxidation.

.....

(F) Food adulteration affects the quality of the food found in the market and it leads to many health issues.

(i) What is food adulteration?

.....

.....

(ii) Name **two** adulterants commonly used in dairy industry.

(1) .....

(2) .....

(G) Sensory evaluation plays an important role in new food product formulation process. State **three** mandatory requirements that should be maintained in a sensory evaluation laboratory.

(i) .....

(ii) .....

(iii) .....

Q1

75

2. (A) State **three** methods that can increase recharging of ground water.

(i) .....

(ii) .....

(iii) .....

(B) Due to the prevailing drought, a farmer found the water table in his agro-well has gone down below the suction lift of his existing water pump. A neighbour proposed him to use a bigger water pump having a higher horse power to solve his problem of water lifting.

(i) Will the problem of the farmer be solved if he implements the neighbour's proposal?

.....

(ii) State the reason for your answer.

.....

.....

*[see page four*

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(C) Drip and sprinkler irrigation systems are considered as water efficient irrigation systems.

(i) State **two** main factors to be considered in selecting the emitters in a drip irrigation system.

(1) .....

(2) .....

(ii) State **two** advantages and **two** disadvantages of a drip irrigation system.

**Advantages**

(1) .....

(2) .....

**Disadvantages**

(1) .....

(2) .....

(iii) Name **three** categories of sprinkler heads based on discharge rate.

(1) .....

(2) .....

(3) .....

(D) A farmer observed blue smoke coming from the exhaust of his old tractor. When he checked the engine he could not find any fault in engine head, gasket or air filter.

(i) What could be the reason for blue smoke?

.....

(ii) What is your solution to correct this situation to a certain extent for a shorter period until the cultivation season is over?

.....

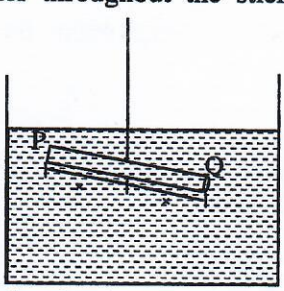
(E) Timber taken from different plant species are used for different purposes. State an example of a suitable plant species for each of the following purpose.

(i) Timber for construction purposes: .....

(ii) Timber for furniture : .....

(iii) Timber for firewood : .....

(F) Following diagram shows what happened when a uniform stick taken from a particular timber tied to a thread exactly in the middle of the stick and immersed in water. Note that the timber was in Equilibrium Moisture Content (EMC) and stick was cylindrical and uniform in diameter throughout the stick.




(i) Which end could be the bottom of the timber tree that the stick was taken?

.....

(ii) State the scientific reason for your answer.

.....

[see page five

Papers.lk Element

(G) Landscape designers use standard symbols to show soft and hard elements on a landscape plan.

(i) State **two** main advantages of using standard symbols on a scaled landscape plan.

(1) .....

(2) .....

(ii) Name the elements shown by the following standard symbols in a landscape plan.

| | Symbol | Name of the element |
|---|---|---|
| (1) | | ..... |
| (2) | | ..... |
| (3) | | ..... |

(H) Cut flower industry provides significant contribution in foreign exchange earning to the country. What is the most suitable stage to harvest following cut flowers for export?

| Name of the cut flower | Most suitable stage for harvesting |
|---|---|
| (i) Anthuriums | ..... |
| (ii) Orchids | ..... |
| (iii) Roses | ..... |

Q2

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3. (A) Soils in Sri Lanka are classified into 14 Great Soil Groups.

(i) Name the **two** most abundant Great Soil Groups in Sri Lanka.

(1) .....

(2) .....

(ii) State **three** main advantages of having a knowledge on the soil types.

(1) .....

(2) .....

(3) .....

(B) Domestic waste water can mainly be categorized as Gray water and Black water.

(i) State **one** major concern in handling black water.

.....

(ii) State **two** major environmental impacts of discharging black water into a surface water body.

(1) .....

(2) .....

(iii) State a use of **untreated** gray water.

.....

*[see page six*

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(C) Ornamental fish breeding for export market brings considerable amount of foreign exchange to the country.

(i) Name **three** suitable characters of an ornamental fish to be selected for the breeding stock.

(1) .....

(2) .....

(3) .....

(ii) State **two** main quarantine measures used in a fish breeding farm.

(1) .....

(2) .....

(D) In circuit diagrams, circuit components are indicated by standard symbols. Draw the relevant standard symbol and state the purpose of using each of the following components in circuits.

| | Circuit component | Symbol | Purpose |
|---|---|---|---|
| (i) | | ..... | ..... |
| (ii) | | ..... | ..... |

(E) The most of the filament bulbs available in the market are not up to the given specifications. Electric current passing through a 75 W filament bulb connected with 230 V stable household electricity supply has been recorded as 0.320 A.

(i) Calculate the actual power (W) of the bulb.

.....

.....

.....

(ii) Calculate the electrical resistance of the bulb.

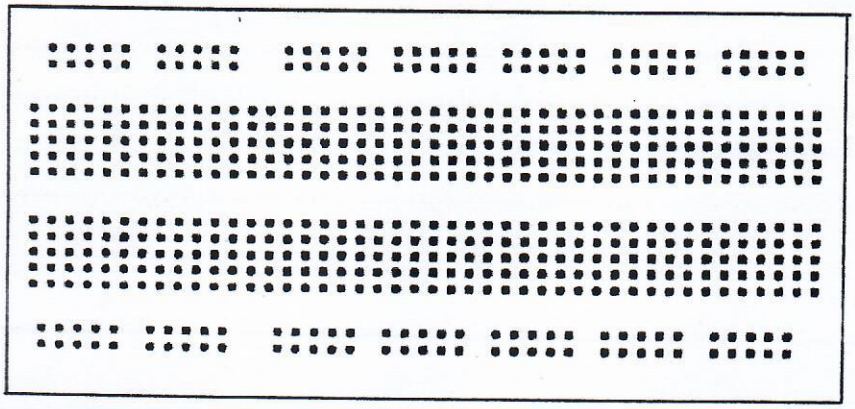
.....

.....

.....

(F) On the following diagram of breadboard, draw the component connection layout to light up a LED bulb, using relevant standard symbols of following components.

Circuit component: 9 V battery, jumper wires, LED bulb, resistor



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Q3

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4. (A) Surveying and levelling are important in the planning stage of a land to increase land productivity.

(i) State **two** important readings that can be taken using a Theodolite.

(1) .....

(2) .....

(ii) State **one** disadvantage in using a Theodolite in land surveying.

.....

(iii) State **two** important measurements that can be obtained using a handheld GPS.

(1) .....

(2) .....

(iv) State **one** important factor to be considered in determining the contour interval of a contour map.

.....

(B) Broiler chicken production provides high returns within a short time period.

(i) Name **two** diversified chicken meat products commonly found in the market.

(1) .....

(2) .....

(ii) State **two** reasons for feeding to be stopped 24 hours before the slaughtering of the chickens.

(1) .....

(2) .....

(iii) List **two** visible characters of fresh good quality chicken meat.

(1) .....

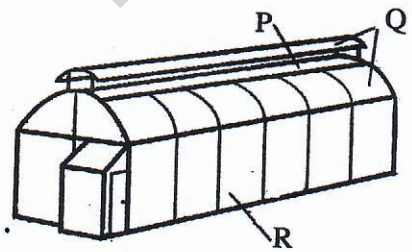
(2) .....

(C) Most of the fresh fish become unsuitable for human consumption due to bad handling at the catching point. State **two** good practices to be followed at the catching point to minimize the quality deterioration of fish.

(i) .....

(ii) .....

(D) A sketch of a polytunnel designed for low country wet zone is shown in the following diagram. Use this diagram to answer question (i) to (iii).




Name suitable covering materials P, Q and R.

(i) P. .....

(ii) Q. .....

(iii) R. .....

[see page eight

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(E) Green tea has become more popular recently among Sri Lankans.

(i) State **one** main reason for the popularity of green tea.

.....

(ii) List **two** main differences in the processes of making black tea and green tea.

(1) .....

(2) .....

(F) What is vulcanization in manufacturing rubber products?

.....

.....

.....

(G) During a safety audit of a work place, the audit team made following recommendations. State the relevant category of each recommendation as per the protocol of the disaster prevention.

| Recommendation | Category |
|---|---|
| (i) Replace old malfunctioning plug bases with new ones | ..... |
| (ii) Install exhaust fans for the stores | ..... |
| (iii) Labelling the chemical materials kept in the stores | ..... |

(H) A rich person wants to establish a farm in a particular location. He does not have a training or knowledge on farming but found there is a very capable agricultural extension officer in that area. When he further investigated, he found an agricultural market and a successful farm nearby.

(i) Based on the above information, if he does a SWOT analysis, name a

(1) strength

.....

(2) weakness

.....

(3) opportunity

.....

(4) threat

.....

(ii) State how he could overcome the weakness he identified in the above question (i) (2).

.....

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Q4

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නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

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

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| ජෛවපද්ධති තාක්ෂණවේදය II<br>உயிர்முறைமைகள் தொழினுட்பவியல் II<br>Biosystems Technology II | 66 E II |

## Part B - Essay

**Instructions:**

* *Answer **four** questions only.*
* *Each question carries **100** marks.*
* *Give clearly labelled diagrams where necessary.*

5. (a) Describe the importance of soil organisms in biosystems.
   (b) Describe the instances where chain surveying **cannot** be implemented in land surveying.
   (c) Explain the process of secondary treatment of wastewater from a fruit processing industry.

6. (a) Describe the quality standards of nursery plants prepared for the market.
   (b) Write advantages and disadvantages of polyculture in food fish rearing.
   (c) Describe the importance of using modern technology in livestock production.

7. (a) State the advantages and disadvantages of modern food preservation techniques used in food industry.
   (b) Describe the factors to be considered in selecting a suitable cladding material for a protected plant house.
   (c) Describe the special features and uses of following land preparation equipment.
      (i) Moldboard plough
      (ii) Disc plough
      (iii) Sub-soil plough

8. (a) State the non-timber forest products commonly found in Sri Lanka with their uses.
   (b) Describe the principle behind the production of active carbon using coconut shells and the main uses of active carbon.
   (c) List the differences between Programmable Logic Control (PLC) systems and microcontroller systems in process automation.

9. (a) Explain the importance of Good Agricultural Practices (GAP) as a quality management system.
   (b) Describe the functions and features of lubrication oils used in automobile engines.
   (c) Draw a simple circuit diagram for a dark sensitive electronic circuit and illustrate necessary modifications in the circuit to operate an array of 230 V electric bulbs to control indoor light conditions of a plant house.

10. (a) Describe the benefits of landscaping.
   (b) Describe the main steps in cleaner production process.
   (c) Explain the importance of management skills required for a successful business.

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