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

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2018 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தரப்) பரீட்சை, 2018 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2018

08.08.2018 / 1300 – 1500

ජෛවපද්ධති තාක්ෂණවේදය I
உயிர்முறைமைகள் தொழினுட்பவியல் I
Biosystems Technology I

66 E I

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. After irrigation, a student observed the quick disappearance of water from a particular soil surface. This may mainly be due to high
   (1) silt content in the soil. (2) clay content in the soil.
   (3) sand content in the soil. (4) bulk density in the soil.
   (5) true density in the soil.

2. In water purification process, Alum is used to
   (1) destroy microorganisms.
   (2) precipitate Mn and Fe ions
   (3) increase flocculation of suspended sediments.
   (4) increase decomposition rate of organic matter.
   (5) adjust pH needed for coagulation and flocculation.

3. Consumptive water use of crop mainly depends on
   (1) infiltration and percolation. (2) evaporation and percolation.
   (3) transpiration and infiltration. (4) evaporation and transpiration.
   (5) transpiration and percolation.

4. The hormone responsible for ovulation in a cow is
   (1) LH. (2) FSH. (3) Oestrogen. (4) Progesterone. (5) Prostaglandin.

5. Sri Lanka's first Ramsar wetland is
   (1) Bundala. (2) Kumana. (3) Vankallai. (4) Maduganga. (5) Anawilundawa.

6. An example for an ornamental aquatic plant cultivated in Sri Lanka for the export market is
   (1) Salvinia. (2) Hydrilla. (3) Monochoria. (4) Cryptocoryne. (5) Water hyacinth.

7. The tourism market can be best explained as,
   (1) the union of air lines and tour operators.
   (2) the place where tourists and guides meet.
   (3) the market which sell goods for tourists.
   (4) the collection of hotels who provide accommodation for tourists.
   (5) a collection of tourist zones and the services associated with those zones.

8. The highest contribution to the total fishery production in Sri Lanka receives from,
   (1) fresh water fishery. (2) coastal fishery.
   (3) deep sea fishery. (4) cage culture fishery.
   (5) pond culture fishery.

[*See page two*

9. Syn gas is a product generated through the partial oxidation of biomass at higher temperature. The major constituents of syn gas are
(1) CO and H_2 (2) CO_2 and H_2 (3) CO and H_2O
(4) CO_2 and H_2O (5) CO_2 and CH_4

● Use following tests/methods to answer question Nos. **10** and **11**.

A - Sudan III test
B - Oven drying method
C - Dye binding method
D - Dean and Stark method

10. Of the above tests/methods, fat in a food material can be qualitatively determined by
(1) A only. (2) B only. (3) C only.
(4) B and C only. (5) C and D only.

11. Of the above tests/methods, the protein content of a food material can be determined by
(1) A only. (2) B only. (3) C only.
(4) B and C only. (5) C and D only.

12. Following are some statements regarding the members of a sensory evaluation panel.
A - Minimum number of members for a sensory evaluation panel should be three.
B - Sensory capacity of the sensory panellists for foods should be at average level.
C - Sensory panellists should be **non-smokers**
Of the above, the correct statement/s regarding the members of the sensory panel would be
(1) A only. (2) B only. (3) C only.
(4) A and B only. (5) A and C only.

13. In caramelization, the key factor that can be directly affected on the final colour of the caramel is
(1) pH. (2) antioxidant.
(3) fat content. (4) temperature.
(5) concentration of polyphenol oxidase enzyme.

● Use following diagram to answer question No. **14**.

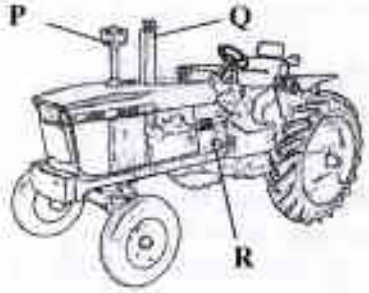
14. The main use of the instrument shown in the above diagram is to
(1) magnify a distantly located object.
(2) locate the bench mark on the ground.
(3) get the elevation difference of different locations.
(4) locate a position respect to a point on the ground.
(5) measure a vertical angle to measure height of a building.

15. An example for an electronic component that can be used as a sensor is
(1) LED. (2) LDR. (3) relay. (4) resistor. (5) transistor.

16. A farmer wants to construct a farm building with the roofing angle of $10° - 15°$. The most suitable roofing material for this structure is
(1) kajan. (2) straw. (3) asbastos.
(4) calicut tiles. (5) half round clay tiles.

[*See page three*

● Use following diagram to answer question No. **17**.



17. Names of the parts labelled as **P**, **Q** and **R** in the above diagram are
(1) air cleaner, silencer and gear box, respectively.
(2) radiator, differential and gear box, respectively.
(3) silencer, air cleaner and engine, respectively.
(4) engine, radiator and gear box, respectively.
(5) gear box, radiator and engine, respectively.

18. Mechanical soil conservation methods are commonly used in steep lands for soil conservation mainly due to
(1) easy maintenance.
(2) effectiveness in managing runoff.
(3) flexibility for farm mechanization.
(4) easiness to establish with minimum labour.
(5) contribution to minimize rain drop impacts.

19. A student experienced the rancid flavour in cheese and butter kept open in room temperature. This may be due to the oxidation of
(1) fat. (2) whey. (3) protein. (4) minerals. (5) lactic acid.

20. Tilapia is a popular food fish found in Sri Lanka. Tilapia is
(1) an invasive species. (2) an endemic species.
(3) a threatened species. (4) an indigenous species.
(5) an introduced species.

21. The structure used by ancient Sri Lankans to reduce erosion of tank dam is
(1) Potavati. (2) Bisokotuwa (3) Rip-rap. (4) Sluice. (5) Water gauge.

22. Following are some statements about water quality parameters.
A - Capacity of water to consume oxygen from degradable organic materials is known as COD.
B - Ca and Mg are major ions contributing water hardness.
C - Coliform test is used to determine total biodegradable materials of water.
Of the above, the correct statement/s would be
(1) A only. (2) B only. (3) A and B only.
(4) A and C only. (5) B and C only.

23. Observations that could be made in a cow in heat would be
(1) swollen vulva, bellowing and lying on the floor.
(2) reddish vulva, frequent urination and restless behaviour.
(3) reddish vulva, restless behaviour and increased feed intake.
(4) swollen vulva, frequent urination and increased milk production.
(5) bellowing, increased milk production and mounting on other cows.

24. Addition of iodine to the common salt can be explained as
(1) irradiation. (2) enrichment. (3) fortification. (4) adulteration. (5) preservation.

[*See page four*

25. The fat content in milk of a particular cow during the first 5 days of lactation was 6.2% and the average fat content of the same cow during the rest of the lactation period was 3.5%. This cow could be belong to
(1) Sindhi breed. (2) Local breed. (3) Jersey breed.
(4) Sahiwal breed. (5) Friesian breed.

26. In embryo transfer of cows,
(1) embryos are obtained two weeks after the insemination.
(2) the body condition score of a donor cow must be above 5.
(3) only a single insemination is done 12 hours after the onset of heat.
(4) both donor and recipient cows should be in the same stage of heat cycle.
(5) the super ovulation is done to select the best ovule among the set of ovules.

27. A net with small eyes are set above the bottom of the fish tank in ornamental fish breeding. The objective of this practice is to
(1) stimulate fish for breeding.
(2) provide a surface for egg laying.
(3) protect the eggs from the parent fish.
(4) prevent the eggs dragging towards the air filter.
(5) prevent the floating of eggs on the water surface.

28. The theme of the Ramsar Convention is
(1) the conservation and wise use of global wetlands.
(2) the mitigation of global greenhouse gas emission.
(3) the conservation and sustainable use of biodiversity.
(4) the replanting of corals destroyed by el-nino and la-nina.
(5) the prevention of the international trade of endangered species.

29. The most suitable package for edible oil is
(1) opaque polythene package. (2) air tight clear glass container.
(3) air tight clear plastic container. (4) transparent polythene package.
(5) air tight opaque plastic container.

30. Adding of organic matter to the soil may increase
(1) runoff. (2) soil pH.
(3) compaction. (4) bulk density
(5) availability of plant nutrients

31. In levelling, on a turning point,
(1) instrument turns 180°.
(2) two foresights are taken.
(3) a back-sight and a foresight are taken.
(4) instrument location does not change.
(5) staff gauge location should be changed.

32. An example for an effective plant growth regulator to induce rooting of a cutting is
(1) Abscesic Acid (ABA). (2) Giberalic Acid (GA3).
(3) Indol Butric Acid (IBA). (4) Napthaline Acetic Acid.
(5) 2–4 Dicholoro Phenoxy Acetic Acid.

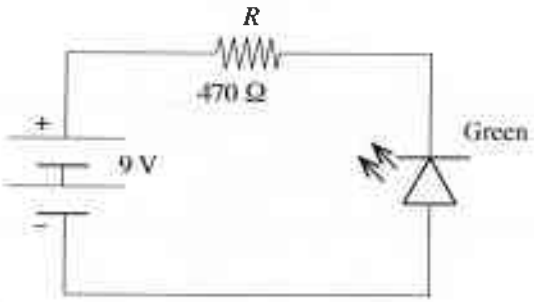
33. The most effective method to control Atawara (*Panicum repens*) weed would be
(1) burning. (2) mulching.
(3) use of biological agents. (4) application of contact weedicide.
(5) application of a systemic weedicide.

|*See page five*

34. The optimum pH and EC level of the nutrient solution in a hydroponic system for crops at vegetative growth stage would be
(1) 2.0 and 5.5, respectively. (2) 3.0 and 4.5, respectively.
(3) 4.0 and 3.5, respectively. (4) 5.0 and 2.5, respectively.
(5) 6.0 and 1.5, respectively.

35. The most suitable type of nursery bed for vegetable crops in low country wet zone in Sri Lanka is
(1) furrows. (2) flat beds. (3) sand beds. (4) raised beds. (5) sunken beds.

● Use this diagram to answer the question No. **36**.



36. A student prepared the above circuit and found LED is not lighting. The reason for **not lighting** the LED in the above circuit would be
(1) the voltage is not enough.
(2) the LED is incorrectly connected.
(3) a capacitor is not connected to the LED.
(4) due to the alternating voltage supplied.
(5) due to the high resistance of connecting wires.

37. An actuator is the mechanism by which a control system acts upon an environment. Examples for actuators are
(1) resistor and a capacitor. (2) thermocouple and an LED.
(3) relay and a transistor switch. (4) battery and a microprocessor.
(5) light bulb and an electric heater.

38. Following are two statements on wind speed.
A - Soil moisture content is influenced by wind speed.
B - When the wind speed is higher, frequent irrigation might be necessary.
Of the above, statements
(1) both A and B are incorrect. (2) A is correct but B is incorrect.
(3) B is correct but A is incorrect. (4) A is correct and B further explains A.
(5) B is correct and A further explains B

39. Higher runoff from an area leads to
(1) siltation. (2) infiltration. (3) percolation.
(4) evapotranspiration. (5) ground water recharge.

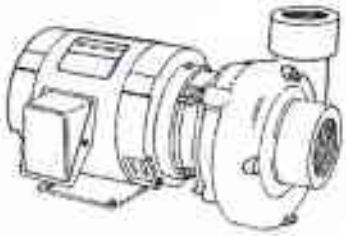
40. The most suitable measure in controlling methane emission from livestock production is
(1) converting animal waste into biogas.
(2) applying animal waste to paddy fields.
(3) rearing animals under intensive system.
(4) rearing animals under free range system.
(5) rearing animals under semi intensive system

[*See page six*

41. In a food production process,
A - Good Agricultural Practices (GAP) may help to maintain the quality of a food material.
B - Selection of high quality planting materials and use of suitable pest control methods may lead to produce high quality foods.
Of the above, statements
(1) both A and B are incorrect. (2) A is correct and B is incorrect.
(3) B is correct and A is incorrect. (4) A is correct and it is further explained by B.
(5) B is correct and it is further explained by A.

42. Following are some of the techniques used in protected structures.
A - Fixing misters
B - Fixing exhaust fans
C - Fixing bio-nets
Of the above, the effective technique/s used to reduce temperature in a polytunnel would be
(1) A only. (2) B only. (3) A and B only.
(4) A and C only. (5) B and C only.

● Following diagram shows a commonly used water pump type in Sri Lanka. Use this diagram to answer question No. **43**.



43. Priming of above type of pumps is done by
(1) running the pump without water.
(2) filling the delivery line with water.
(3) emptying the pump before starting.
(4) inserting air in to the casing of the pump.
(5) filling the pump and the suction line with water.

44. On a rainy day, rain gauge accumulated 462 cm^3 rain water. If the diameter of the rain gauge is 14 cm, the rain fall received on this day is
(1) 1 cm. (2) 3 cm. (3) 5 cm. (4) 7 cm. (5) 9 cm.

45. Bioremediation can be effectively used to
(1) clean air inside a greenhouse.
(2) provide micronutrients to the crops.
(3) control alien invasive aquatic weeds.
(4) generate energy from the farm waste.
(5) treat waste water from a food processing factory.

46. In surveying, the height of the instrument changes
(1) at each location of the staff gauge.
(2) in undulating lands with no turning points.
(3) in obtaining foresights between turning points.
(4) with the change of the location of the instrument.
(5) in obtaining staff gauge reading on the bench mark.

47. To control a pest damage, the most suitable stage for application of pesticide for a crop would be
(1) after the epidemic level.
(2) after the economic injury level.
(3) before the economic injury level.
(4) after the economic threshold level.
(5) before the economic threshold level.

[*See page seven*

48. A farmer irrigated his manioc field on the previous day before the harvesting. This can be best explained as
    (1) wasting of irrigation water.
    (2) pre-harvest operation to minimize post-harvest losses.
    (3) pre-harvest operation to maximize the weight of the harvested manioc.
    (4) pre-harvest operation to maintain the freshness of the harvested manioc.
    (5) pre-harvest operation to reduce the cyanide content of the harvested manioc.

49. The most suitable state to harvest pineapple is when
    (1) fruits are green and matured.
    (2) 10% of the fruits are yellow in colour.
    (3) 50% of the fruits are yellow in colour.
    (4) 80% of the fruits are yellow in colour.
    (5) leaves in the crown become pale green.

50. Of the following, what would be the safety icon commonly use to express slippery floor?

(1) (2) (3) (4) (5)

* * *

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

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2018 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2018 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2018

ජෛවපද්ධති තාක්ෂණවේදය II உயிர்முறைமைகள் தொழினுட்பவியல் II **Biosystems Technology II**	**66**	**E**	**II**

10.08.2018 / 1400 – 1710

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 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 - 10)

* *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		
Percentage		

Final Marks

In numbers	
In words	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Marks checked by	
Supervised by	

[see page two

PART A – Structured Essay

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

Do not write in this column

1. (A) Precipitation is one of the important components of the water cycle.

(i) State **two** forms of precipitation found in Sri Lanka.

(1) .....

(2) .....

(ii) State **two** main impacts of heavy rainfall on bio-systems.

(1) .....

(2) .....

(B) The productivity of a soil mainly depends on the eco systems health of the soil.

(i) List **two** visible characteristics of a healthy soil.

(1) .....

(2) .....

(ii) State an anthropological activity that degrades the healthiness of an agricultural soil.

.....

(iii) State **two** major problems which may occur due to waterlogging in an agricultural land.

(1) .....

(2) .....

(iv) State a measure that could be used to reclaim a soil which is waterlogged.

.....

(v) Name a crop adopted to waterlogged condition.

.....

(C) A student observed large number of dead fishes in a water body.

(i) What could be the main water quality parameter responsible for the death of fish in the above water body?

.....

(ii) State a measure that could have been taken to rectify this situation in the above water body.

.....

(D) Sub-surface irrigation minimizes the water losses due to evaporation from the soil surface.

(i) In addition to minimizing the evaporation losses, state **two** more advantages of using a sub-surface irrigation system.

(1) .....

(2) .....

(ii) State a main **disadvantage** of sub-surface irrigation when compare to surface irrigation.

.....

(iii) Drip irrigation can be used successfully if the water quality is good. State the water quality related factor that hinders the application of drip irrigation technology in certain parts of the dry zone of Sri Lanka.

.....

[see page three

Do not write in this column

0126

(E) Surface irrigation is the most common irrigation method used in Sri Lanka.

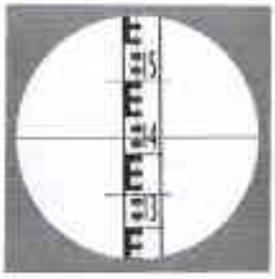
(i) State **one** major factor that determines the length of a furrow in ridge and furrow irrigation.

.....

(ii) State a main advantage of using pitcher irrigation compared to basin irrigation.

.....

(F) Following figure shows a view from a levelling instrument on a staff gauge. Use this diagram to answer questions (i) to (iii).



(i) What is the reading of the staff gauge?

.....

(ii) If the staff gauge is on a location 0.5 m above the bench mark (0 m) what would be the height of the levelling instrument?

.....

(iii) State an instance the instrument needs to be placed in a different location (turning point) in levelling.

.....

(iv) State **two** main advantages of plain table surveying compared to chain surveying.

(1) .....

(2) .....

(G) Post-harvest techniques are mainly used to maintain the quality of the agricultural produce. Name the most appropriate post-harvest technique to achieve following objectives.

(i) Control anthracnose disease on mangoes and papayas

.....

(ii) Minimize loss of sugar in harvested sweet corn

.....

(iii) Prevent greening of harvested potato tubers

.....

(iv) Handling cut flowers to minimize the wilting during the postharvest period

.....

Q1

60

[see page four

Do not write in this column

2. (A) Following diagrams show different types of stem modifications commonly used as propagules in vegetative propagation. Name the stem modification and state one crop as an example for each of the modification.

P Q R

	Name of the stem modification	Crop
(i) P	.....	.....
(ii) Q	.....	.....
(iii) R	.....	.....

(B) ISO 22000 allows a company to show their customers that they have a food safety management system in place. State **two** benefits of ISO 22000 to the customers.

(i) .....

(ii) .....

(C) The nutrition labelling has become a common practice as most of the consumers are interested to read the nutrition label before buying a food item.

(i) State the main importance of nutritional labelling.

.....

(ii) Name a food that is exempted from nutritional labelling.

.....

(D) Determination of market demand for a new food product is one of the most important steps in a new product development process.

(i) State **three** methods that can be used to determine the market demand of a new food product.

(1) .....

(2) .....

(3) .....

(ii) State **three** basic criteria that can be followed in the selection of raw materials for a new food product.

(1) .....

(2) .....

(3) .....

(E) Control systems are widely used in bio-systems engineering applications.

(i) Write an example of using a control system in bio-systems engineering applications related to food production.

.....

(ii) State **two** advantages of using the example, mentioned in (i) above compared to manual operation.

(1) .....

(2) .....

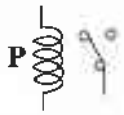
[see page five

Do not write in this column

(iii) State the function of the sensor used in the above mentioned control system.

.....

(iv) Following is a schematic diagram of an electromagnetic relay. Use this diagram to answer questions (1) and (2).



(1) Write the function of **P** in the above diagram.

.....

(2) State an example of using the device shown in the above diagram in a control system.

.....

(F) Pumps are commonly used to lift water.

(i) Piston pumps are not common compared to centrifugal pumps as water lifting devices. Write the main reason for this.

.....

(ii) State **two** water lifting devices other than pumps.

(1) .....

(2) .....

(G) Roasted and powdered cereals and pulses are mixed together to formulate a composite flour. Name **two** essential amino acids available in above mentioned composite flour.

(i) .....

(ii) .....

(H) Diversification of food may improve the availability of food in the market. List **three** diversified foods available in the market and state the technology used to diversify each food.

	Diversified food	**Technology used**
(i)	.....	.....
(ii)	.....	.....
(iii)	.....	.....

Q2

60

3. (A) Agricultural bio-systems are adversely affected by pests, diseases and weeds.

(i) Classify the weeds into **three** main groups based on their morphological characters.

(1) .....

(2) .....

(3) .....

(ii) State the most suitable weed control method to control following weeds.

(1) *Panicum repens* .....

(2) *Cyperus iria* .....

[see page six

Do not write in this column

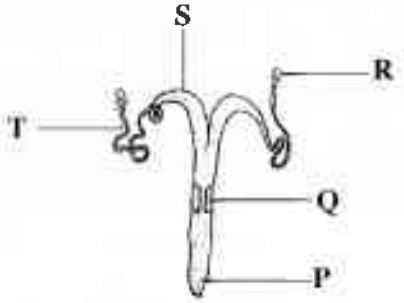
(iii) State the nature of the damage and a control method of following insect pests.

Insect pest	Nature of the damage	Control method
(1) *Drosicha mangiferae* (Mango mealy bug)	.....	.....
(2) *Dacus cucurbitae* (Fruit fly)	.....	.....
(3) *Maruca testulalis* (Legume pod borer)	.....	.....

(B) Pre-seed treatments are important to ensure good germination and growth of a crop plant. State the suitable pre-seed treatment for following seeds.

Name of the seed	Pre-seed treatment
(i) Rice	.....
(ii) Winged bean	.....
(iii) Passion fruit	.....

(C) The following diagram illustrates the reproductive system of a cow. Use this diagram to answer questions (i) to (iii).



(i) Name the parts labelled as **P**, **Q**, **R**, **S** and **T** in the above diagram.

(1) **P** .....

(2) **Q** .....

(3) **R** .....

(4) **S** .....

(5) **T** .....

(ii) Name the place where the semen is deposited during artificial insemination.

.....

(iii) State the place where the fertilization takes place.

.....

(D) A farmer involved in pond fish culture, in his morning visit to the pond observed a fleet of fish swimming close to the surface of water with open mouths.

(i) What could be the most probable reason for his observation?

.....

(ii) State an appropriate measure to overcome this situation.

.....

[see page seven

(E) Escalating fuel prices hinder the economic development of developing countries.

(i) Name **two** renewable energy sources that could be used to overcome above problem.

(1) .....

(2) .....

(ii) State the major difference between energy production using biomass and fossil fuel.

.....

(F) A hazard can cause a potential harm to a vulnerable target and many measures are taken to minimize hazard risks.

(i) What is OHSAS 18001?

.....

(ii) Substitution is one method of hazard control. Name **one** example for the application of substitution as a hazard control method.

.....

(G) Adventure tourism involves exploration with a certain degree of risk, and it requires special skills and physical exertion. State **two** activities perform under the adventure ecotourism in Sri Lanka.

(i) .....

(ii) .....

Do not write in this column

Q3

60

4. (A) People who have entrepreneurial success are often referred to as "enterprising businessman."

(i) A particular person having following characteristics wants to initiate his own agribusiness.

- Ability to make many friends
- Ability to manage money
- Ability to bear the losses
- Ability to avoid risks
- Ability to live with stress
- Ability to spot new trends
- Ability to identify strengths and weaknesses
- Ability to hire effective people

Of above characteristics, list **three** skills required to succeed as an entrepreneur.

(1) .....

(2) .....

(3) .....

(ii) What is a business plan?

.....

.....

(B) Plant extracts are substances extracted from tissues of plants, to be used for a particular purpose. State an example of plant extract used for each of the following purposes.

(i) As a pesticide .....

(ii) As a cosmetic item .....

(iii) As a perfume .....

(ii) As a liquid fertilizer .....

(C) In community forestry, local community plays a significant role in forest management and land use decision making. List **three** main importance of community forestry.

(i) .....

(ii) .....

(iii) .....

[see page eight

Do not write in this column

(D) The ornamental fish industry in Sri Lanka has become a valuable foreign exchange earner.

(i) Name **three** structures commonly use in ornamental fish culture.

(1) .....

(2) .....

(3) .....

(ii) Name **three** ornamental fish species having high export value.

(1) .....

(2) .....

(3) .....

(E) In commercial agriculture, controlled environmental conditions are commonly used to obtain high yields with improved quality.

(i) List **three** main climatic factors that are controlled in "Controlled Environment Agriculture".

(1) .....

(2) .....

(3) .....

(ii) State the most suitable type of poly-tunnel for following agro-climatic zones.

Agro-climatic zone	**Most suitable type of poly-tunnel**
(1) Low country	.....
(2) Up country	.....

(F) Use following diagram to answer questions (i) and (ii).

(i) What is the art of cultivation of plants shown in above diagram?

.....

(ii) State **two** main advantages of this type of cultivation.

(1) .....

(2) .....

(iii) Name a suitable plant species for this type of cultivation.

.....

(G) Use of farm machinery has become popular in present day agriculture due to labour shortage. State **three** factors to be considered in selecting farm machinery for primary land preparation.

(i) .....

(ii) .....

(iii) .....

Q4

60

* *

[see page nine

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

අධ්‍යයන පොදු සහතික පත්‍ර (උසස් පෙළ) විභාගය, 2018 අගෝස්තු
கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2018 ஓகஸ்ற்
General Certificate of Education (Adv. Level) Examination, August 2018

ජෛවපද්ධති තාක්ෂණවේදය II
உயிர்முறைமைகள் தொழினுட்பவியல் II
Biosystems Technology II

66 E II

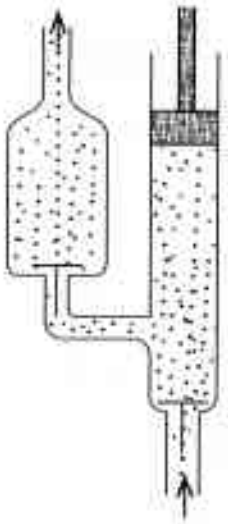
Part B - Essay

Instructions:
* *Answer **four** questions only.*
* *Give clearly labelled diagrams where necessary.*

5. (a) Describe the effects of temperature and rainfall on aquaculture systems.
   (b) Describe the use of 'Radiation Method' in plain table surveying for finding the land area in a small land with no obstructions.
   (c) Describe the positive and negative impacts of pre-harvest operations on post-harvest losses of crops.

6. (a) Explain how to manipulate the major environmental factors inside a protected house to ensure the maximum crop growth and yield.
   (b) Describe the factors to be considered in selecting an irrigation system for a crop.
   (c) Describe the characteristics and the functions of lubricants used in machinery.

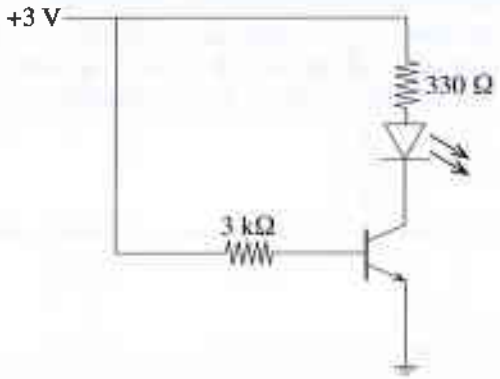
7. (a) Copy the following diagram to your answer script, name the main parts and describe the operation of this water lifting machine.



   (b) Describe the measures you should adopt to maintain the suitable water quality status in a fish pond.
   (c) Describe what are the conditions required to be maintained in a biogas unit to obtain maximum biogas yield.

[see page ten

8. (a) Describe the operation of the following circuit. Write an example of using similar circuit in automation.



(b) Explain how the modern technological applications have been used to improve the efficiency of the livestock sector.

(c) Explain the post-harvest techniques to be used to improve the shelflife of cut flowers and cut leaves.

9. (a) Describe the process that should follow to determine the market demand of a new food product.

(b) Describe the processes leading to soil degradation

(c) Distinguish between the Economic Injury Level (EIL) and Economic Threshold Level (ETL) and explain the importance of above two levels in pest management.

10. (a) Explain the impact of blanching on final quality of dehydrated vegetables.

(b) Describe the personality skills needed to become a successful entrepreneur

(c) Explain the problems encounter in obtaining plant extracts and ways to overcome these problems.

* * *