නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

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

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.*
* ***Non programmable calculators are allowed to use.***

1. In most of the instances, winds that travel to a region blowing on a large water body make the region's climate more
(1) warmer. (2) cleaner. (3) wetter. (4) cooler. (5) drier.

2. In the process of making desiccated coconut, removal of germinated kernels is done during
(1) paring. (2) seasoning. (3) dehusking. (4) hatchetting. (5) sterilization.

3. In the cinnamon industry, cinnamon leaves are mainly used
(1) as a soil mulch.
(2) to prepare compost.
(3) as an organic pesticide.
(4) to extract essential oils.
(5) to prepare livestock feed.

4. In surveying, planimeter is generally used to measure,
(1) angles. (2) horizontal distance.
(3) area. (4) vertical height.
(5) altitude.

5. In order to obtain disease free plants, the most suitable plant part to be used in micro-propagation is
(1) anther. (2) embryo. (3) leaf tissue. (4) root tissue. (5) meristem tissue.

6. *Bacopa* is a
(1) salt water aquatic plant.
(2) fresh water aquatic plant.
(3) live feed form for fingerlings.
(4) brackish water food fish species.
(5) brackish water ornamental fish species.

7. In general, saline soils have
(1) lower EC than sodic soils.
(2) higher pH than sodic soils.
(3) higher ESP than sodic soils.
(4) lower ESP and lower pH than sodic soils.
(5) lower ESP and higher pH than sodic soils.

[*See page two*

8. The best parameter to test wastewater for its capacity to deplete oxygen level in water is

(1) Dissolved Oxygen. (2) Total Suspended Solids.
(3) Total Coliform Counts. (4) Biological Oxygen Demand.
(5) Chemical Oxygen Demand.

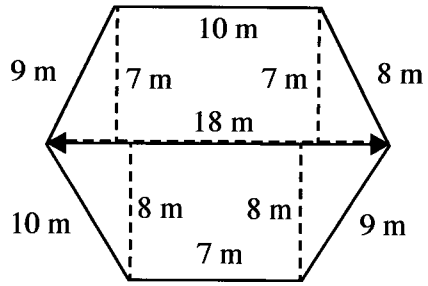
9. Coarse textured soils are low in,

A - Soil microbial activity.
B - Water holding capacity.
C - Cation exchange capacity.

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 sketch obtained from a plain table surveying using radiation method to answer question **10**.



10. The area of the sketch shown in the above diagram is

(1) 192.5 m^2. (2) 198.0 m^2. (3) 270.0 m^2. (4) 306.0 m^2. (5) 396.0 m^2.

11. Microbial spoilage of foods is mostly taken place when the pH range of food is within

(1) 4.5 to 5.5. (2) 5.5 to 6.5. (3) 6.5 to 7.5.
(4) 7.5 to 8.5. (5) 8.5 to 9.5.

12. Before freezing vegetables, blanching is done mainly to

(1) reduce the fiber content in the vegetables.
(2) inactivate enzymes found in the vegetables.
(3) denature the protein found in the vegetables.
(4) wash the dirt found on the surface of the vegetables.
(5) inactivate microorganisms found in the vegetables.

13. In a commercial plant nursery, freshly potted plants are kept under shade for 5-10 days. This is done to

(1) increase transpiration. (2) maintain high humidity.
(3) control pests and diseases. (4) reduce evapotranspiration.
(5) avoid drying of potting media.

14. Egg shape index is the percentage of the ratio of

(1) width to length of the egg, and it is important in packaging of eggs.
(2) weight to length of the egg, and it is important in packaging of eggs.
(3) width to length of the egg, and it is important in determining the cooking quality.
(4) weight to length of the egg, and it is important in determining the cooking quality.
(5) weight to width of the egg, and it is important in determining the crushing strength.

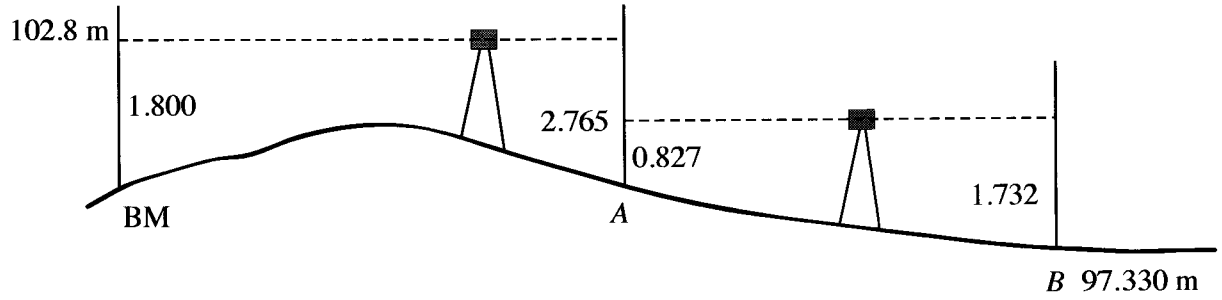
15. The farm equipment that can be used for both pulverizing the soil and intercultivation of crop fields is

(1) spike tooth harrow. (2) disc harrow. (3) rotavator.
(4) level board. (5) rotary weeder.

[*See page three*

16. In the power transmission system of a four wheel tractor, the torque is altered by
(1) gear box. (2) fly wheel. (3) differential.
(4) crank shaft. (5) power take off shaft.

- Use following diagram to answer question **17.**

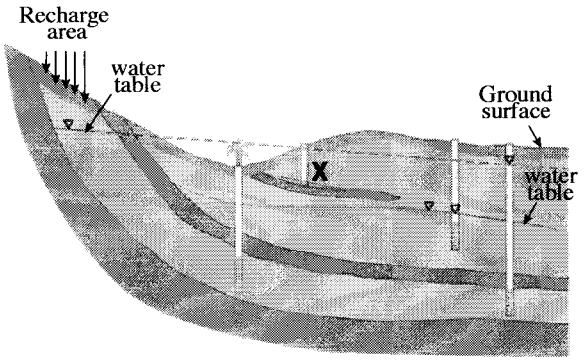


17. According to the sketch given in the above diagram, the altitude at '*A*' should be
(1) 96.503 m. (2) 98.235 m.
(3) 99.889 m. (4) 103.765 m.
(5) 105.565 m.

18. Propagation structures are generally considered as
(1) top vent structures.
(2) temporary structures.
(3) permanent structures.
(4) full protected structures.
(5) semi-permanent structures.

19. Two statements on offsets are given below.
A - Perpendicular offsets are drawn from main survey line to an object in the field.
B - At least two oblique offsets are necessary when perpendicular offsets **cannot** be obtained.
Of the above two statements,
(1) A is correct and B is incorrect.
(2) B is correct and A is incorrect
(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.

- Different types of aquifers are shown in the diagram given below. Use this diagram to answer question **20**.



20. In this diagram, 'X' can be identified as,
(1) perched aquifer.
(2) artesian aquifer.
(3) non-artestian aquifer.
(4) semi-artestian aquifer.
(5) semi-confined aquifer.

21. Compared to raw rice, parboiled rice
(1) has low nutritive value.
(2) contains more impurities.
(3) has higher head rice recovery rate.
(4) contains less proteins and minerals.
(5) needs more polishing during the processing.

[*See page four*

22. In livestock farms, Radio Frequency Identification (RFID) tags are used to
(1) identify the animals in a dairy herd.
(2) predict the heat period of the heifers.
(3) detect sick broiler birds in a closed poultry house.
(4) count the number of animals in a farm accurately.
(5) obtain information of each animal in a farm individually.

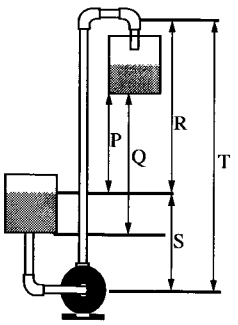
23. A forest plant commonly used to extract resins is,
(1) Mee (*Madhuca longifolia*).
(2) Palu (*Manilkara hexandra*).
(3) Rubber (*Hevea brasiliensis*).
(4) Kothalahimbutu (*Salacia reticulata*).
(5) Pinus (*Pinus caribaea*).

24. Following are three statements on biological wastewater treatment process.
A - Both floating and suspended coarse particles are removed during preliminary treatment through screening.
B - After the sedimentation of suspended particles, a suitable chemical is added to enhance the secondary treatment.
C - Aeration is done to facilitate decomposition.
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.

25. In the cut flower industry, Anthurium flowers are graded mainly on the basis of the,
(1) size of the spathe.
(2) age of the flower.
(3) length of the stalk.
(4) colour of the stalk.
(5) length of the spadix.

● Use the following diagram of water lifting by a centrifugal pump to answer question **26**.

26. In this diagram, the total head is
(1) P.
(2) Q.
(3) R.
(4) S.
(5) T.



27. A quality controller in a broiler meat factory, after inspecting the defeathered carcasses, made following observations.
* Few residual feathers are there on the back, wings and tail
* partially removed cuticle
* breast meat colour normal.
Based on the above observations, scalding temperature used must be
(1) 30° C. (2) 40° C. (3) 50° C. (4) 60° C. (5) 70° C.

28. Following are two statements regarding the aquatic ornamental plants.
A - Aquatic plants reduce algae growth in aquariums.
B - Aquatic plants compete with algae for nutrients.
Of above statements,
(1) Both A and B are incorrect.
(2) A is correct but B is incorrect.
(3) A is incorrect but B is correct.
(4) both A and B are correct and A further explains B.
(5) both A and B are correct and B further explains A.

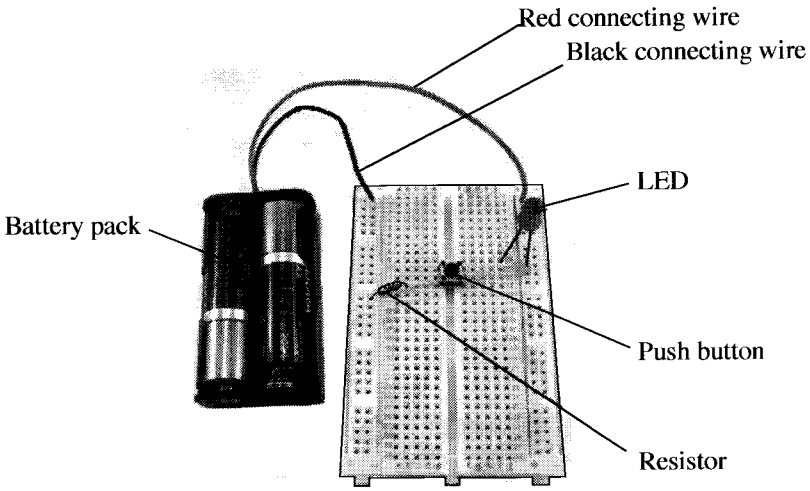
[*See page five*

29. Pulse electric field technology in food preservation is used for preserving,
(1) solids only.
(2) liquids only.
(3) liquids and solids only.
(4) solids and semi-liquids only.
(5) liquids and semi-liquids only.

30. Before introducing a new product to the market, the most suitable method to find out the market demand would be,
(1) the use of a questionnaire.
(2) conduct of face to face interviews.
(3) conduct of focused group discussions.
(4) distribution of free samples to the community.
(5) pre advertisement of the product using mass media.

31. In a hydroponic system, the most essential components for a plant to grow are
(1) solvent, sunlight, space to grow, heat and soil.
(2) water, sunlight, place to grow, heat and nutrients.
(3) solvent, sunlight, place to grow, heat and nutrients.
(4) water, light, space to grow, temperature and soil.
(5) water, light, space to grow, temperature and nutrients.

- Use the following diagram of a circuit to answer question numbers **32**.



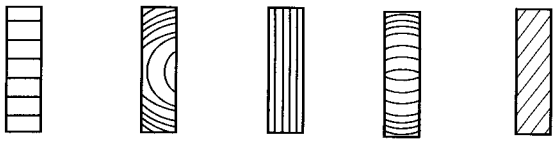
32. Of the above diagram, when battery pack is connected to the breadboard, The LED will illuminate
(1) when the resistor is removed.
(2) when the push button switch is on.
(3) when the resistor and LED are interchanged their locations.
(4) when the red and black connecting wires are interchanged.
(5) when the black colour connecting wire is connected to the outer line of the power rail.

33. In automobile engines, lubricants are mainly used to
(1) reduce the friction between moving parts.
(2) control the temperature inside the engine.
(3) reduce the blue smoke coming from exhaust.
(4) ignite the fuel inside the combustion chamber.
(5) prevent freezing the engine in cooler climates.

34. A farmer wanted to find out the time he has to spend to apply weedicide to his 1 ha field. The spray width of his knapsack sprayer is 1 meter. If he can walk 50 meters per minute carrying the sprayer, the time he needs to spray his land is approximately
(1) 2 hours (2) 2 hours and 30 minutes (3) 3 hours
(4) 3 hours and 30 minutes (5) 4 hours

|*See page six*

• Use the following diagrams showing the grain direction of different timbers to answer question **35.**



P Q R S T

35. Of the timbers shown in the above diagrams, the most suitable timber for construction purposes would be

(1) P. (2) Q. (3) R. (4) S. (5) T.

36. A person who is **not** eligible to claim for compensation under the Workmen Compensation Ordinance 19 of 1934 would be

(1) army soldier.
(2) farm labourer.
(3) security guard in a bank.
(4) hospital sanitary worker.
(5) machine operator in a garment factory.

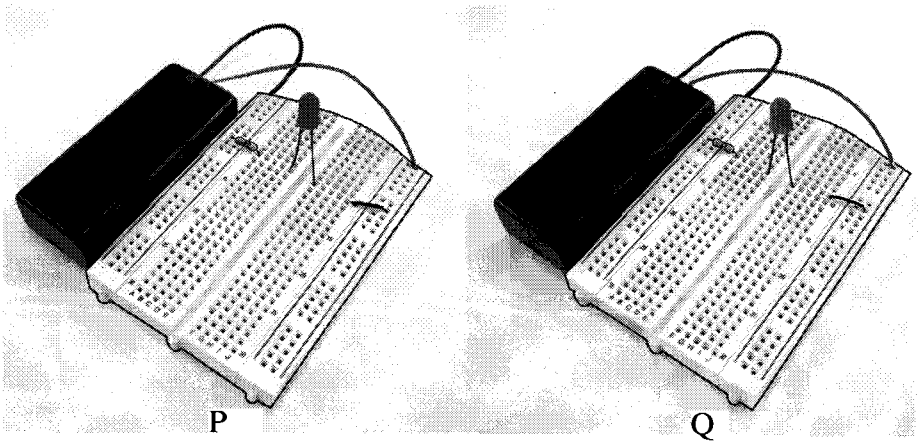
37. As a hedge plant, Ixora is the most suitable to establish hedgerow,

(1) to cover unwanted places.
(2) to divide the nursery of a land.
(3) along the boundaries of a land.
(4) on the sides of the walking path.
(5) to prevent entering humans to a restricted area.

38. In electronic circuits, resistors are mainly used to

(1) divide voltage and measure the voltage.
(2) divide voltage and measure the resistance.
(3) reduce current flow and adjust signal levels.
(4) reduce current flow and measure the current.
(5) terminate transmission lines and measure the current.

• Use the following two circuit diagrams to answer question **39.**



P Q

39. When the circuits shown in the above diagram are switched on,

(1) only LED in P will illuminate.
(2) only LED in Q will illuminate.
(3) both LEDs in P and Q will illuminate.
(4) both LEDs in P and Q will not illuminate.
(5) LED in P will emit more light than LED in Q.

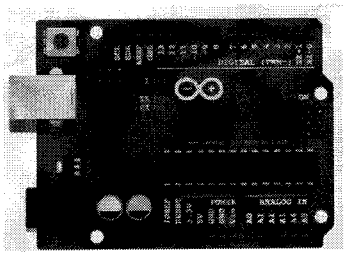
[*See page seven*

40. In arc welding works, step-down transformers are used to produce,
(1) low current and low voltage to minimize the cost of electricity.
(2) low voltage to reduce the risk of electric shocks to the operator.
(3) low current to reduce the risk of electric shocks to the operator.
(4) high voltage to generate high temperature at the point of welding.
(5) high current to generate high temperature at the point of welding.

41. A micro-controller is a
(1) small chip made of silver.
(2) portable circuit capable of making other circuits.
(3) small Central Processor Unit (CPU) made of transistors and conductors.
(4) computer processor that incorporates the functions of a central processing unit on a single integrated circuit (IC).
(5) small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals.

- Use the following diagrams to answer question **42.**

42. This diagram shows a
(1) Vero board.
(2) Arduino board.
(3) Microprocessor.
(4) Step-up transformer.
(5) Programmable Logic Controller.



43. When a sample of about a tea spoonful of chilli powder taken from a packet of chilli powder bought from the open market was sprinkled on the water surface in a glass of water, following observations were made.

* Some particles of chilli powder descended in the water making red coloured streaks.
* Grittiness was felt when rubbing the sediment accumulated at the bottom of the glass.

Based on the above observations, one can guess that, this chilli powder is
(1) not adulterated.
(2) adulterated with brick powder.
(3) adulterated with artificial colorants.
(4) adulterated with brick powder and artificial colorants.
(5) adulterated with paddy husk powder and artificial colorants.

44. Postharvest longevity of cut flowers depends on preharvest agronomic practices. One of the important preharvest practices to maintain longevity of harvested cut flowers is
(1) exposing to direct sunlight to reduce fungal infections.
(2) subjecting to slight water stress to protect from pest attacks.
(3) washing the flowers with adequate water to remove dirt from flowers.
(4) removing of insect pests from the plants to minimize postharvest damages.
(5) watering the plants before cutting the flowers to maintain the turgidity of the cells.

45. High moisture percentage in solid waste increases

A - energy requirement in incineration.
B - the transportation cost due to increased weight.
C - microbial activity during composting.

Of the above, the correct statement/s would be

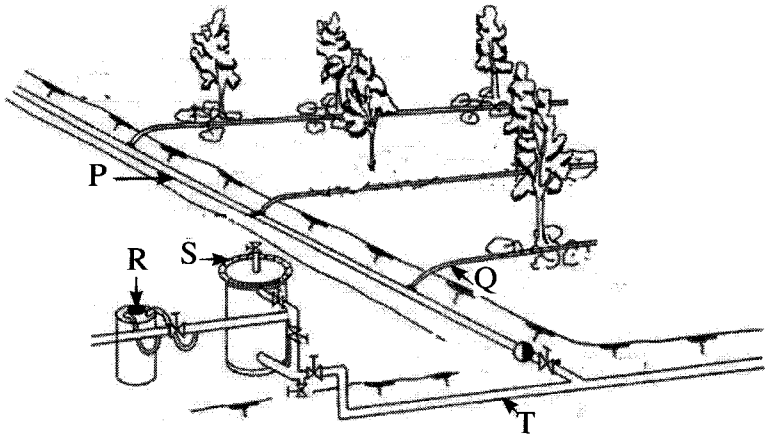
(1) A only. (2) B only. (3) C only. (4) A and B only. (5) B and C only.

[*See page eight*

46. An environmental benefit of cleaner production process is
(1) reduction of production cost.
(2) reduction of gaseous emissions.
(3) use of alternative power for production.
(4) efficient use of energy and raw materials.
(5) improvement of the quality of the product.

47. A solar cell is an electrical device that converts the energy of light directly into electricity. This is done using
(1) physical effect. (2) thermal effect. (3) chemical effect.
(4) photovoltaic effect. (5) atmospheric effect.

- Use the following diagram of drip irrigation system to answer question **48.**



48. On the above diagram, fertigation unit, filter, main line, sub-line and lateral line is labelled as
(1) P, Q, R, S and T respectively.
(2) S, R, Q, T and P respectively.
(3) R, S, T, P and Q respectively.
(4) S, T, P, Q and R respectively.
(5) R, P, Q, T and S respectively.

49. One of the most appropriate short-term solutions to face the food security problems created by recent COVID - 19 pandemic would be the establishment of more
(1) fruit crops. (2) model farms. (3) livestock farms.
(4) home gardens. (5) protected agriculture structures.

50. Among the following, the biggest **mistake** one can make when preparing a business plan would be
(1) misrepresenting facts.
(2) not including at least one appendix.
(3) not mentioning the technology to be used.
(4) forgetting to include the executive summary.
(5) failing to mention a clear vision of the business.

* * *

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

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

ජෛවපද්ධති තාක්ෂණවේදය II
உயிர்முறைமைகள் தொழினுட்பவியல் II
Biosystems Technology II

66 E II

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 you will answer and decide which of them you will prioritise.

Index No. : .....

Instructions :

* *This question paper comprises of **two** parts, Part **A** and Part **B**. The time allotted for **both parts** is **three hours**.*
* ***Use of non-programmable calculators is allowed.***

PART A — Structured Essay : (pages 2 - 7)

* *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 8)

* *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

PART A – Structured Essay

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

Do not write in this column

1. (A) The concentration of CO_2 in Earth's atmosphere is around 400 ppm.

(i) State an activity contributing to increase the CO_2 concentration in the atmosphere.

.....

(ii) State an activity contributing to decrease the CO_2 concentration in the atmosphere.

.....

(B) Soil organisms influence vast variety of functions in ecosystems.

(i) State **two** importances of soil organisms in biosystems.

(1).....

(2).....

(ii) Name **two** soil organisms that can be used as bio-pesticides.

(1).....

(2).....

(C) Microbes in wastewater create many health and environmental issues when released **untreated**.

(i) State a group of microbes that can be used as an indicator to test the presence of harmful microbes to humans in wastewater.

.....

(ii) If wastewater released from a particular treatment plant to contain microbes, state **two** suitable methods to eliminate those microbes prior to release wastewater to the environment.

(1).....

(2).....

(D) Chain survey is considered as one of the oldest surveying methods.

(i) What is the main limitation in chain surveying?

.....

(ii) State the main principle of chain surveying.

.....

(iii) In addition to the metric chain or engineering chain, name **two** most important equipment / instruments needed in chain surveying.

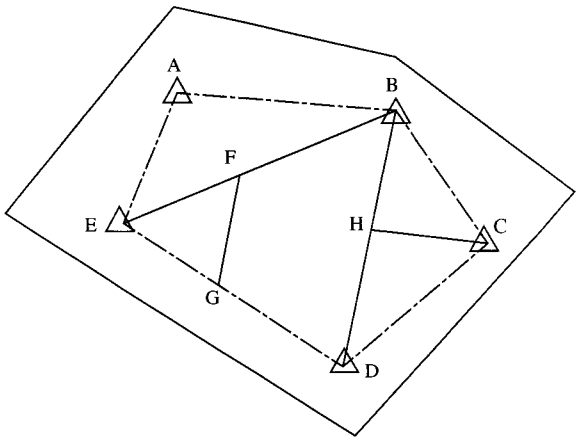
(1).....

(2).....

[see page three

Do not write in this column

(iv) Use the following chain surveying sketch to answer question (1) and (2).



(1) Name a subsidiary survey line shown in the above diagram.

.....

(2) Name a check line shown in the above diagram.

.....

(E) Micropropagation is commonly used in commercial floriculture nurseries.

(i) Define 'micropropagation'.

.....

.....

.....

(ii) State the specific advantage of micropropagation over other vegetative propagation methods.

.....

(iii) Name a food crop propagated by micropropagation.

.....

(F) Maturity indices are the indications of the readiness of the fruits and vegetables for harvest. List **two** chemical factors that could be used as maturity indices of fruits.

(i).....

(ii).....

Q1

75

2. (A) A farmer wanted to increase groundwater yield in the agrowell in his farm. For this, it is necessary to increase the groundwater recharge in his land.
State **one** simple and economical method to increase recharging of groundwater.

.....

(B) Aquatic plants are widely used in the ornamental fish industry.
List **three** main functions of ornamental aquatic plants in an aquarium.

(i) .....

(ii) .....

(iii) .....

[see page four

Do not write in this column

(C) Following are some statements regarding livestock production. State whether each statement is true **(T)** or false **(F)**.

Statement	True (T) or False (F)
(i) Eggs are a good source of complete protein.	
(ii) All grades of eggs are equally nutritional.	
(iii) A cow is milked only once a day.	
(iv) COB test is done to find out whether milk is adulterated with Urea.	
(v) In Sri Lanka, broiler chicken are given steroids to fatten them faster.	

(D) General objective of the Food Act is to ensure the availability of safe, wholesome and honestly presented food supply for human consumption.

(i) State **four** activities controlled by the Food Act, No. 26 of 1980.

(1).....

(2).....

(3).....

(4).....

(ii) Who is the authority to enforce the Food Act No. 26 of 1980?

.....

(E) Food label is a legal requirement and it provides valuable information to the consumers to select their desired foods. State the main importance of the following information found on a label of a food product.

Information	Importance
(i) Batch No.	.....
(ii) Common name of the product	.....
(iii) Registration No.	.....
(iv) Date of manufacture and date of expiry	.....

(F) State **two** mechanisms used to control temperature in polytunnels located in low country.

(i).....

(ii).....

Q2

75

3. (A) State the main function of each of the following components in an engine cooling system.

Component	Main function
(i) Radiator	.....
(ii) Thermostat valve	.....
(iii) Water pump	.....

[see page five

Do not write in this column

(B) State **three** important factors to be considered in installing a centrifugal pump in the water lifting system.

(i).....

(ii).....

(iii).....

(C) Sprinkler irrigation is a method of applying irrigation water similar to rainfall.

(i) State **two** main advantages of a sprinkler irrigation system.

(1) .....

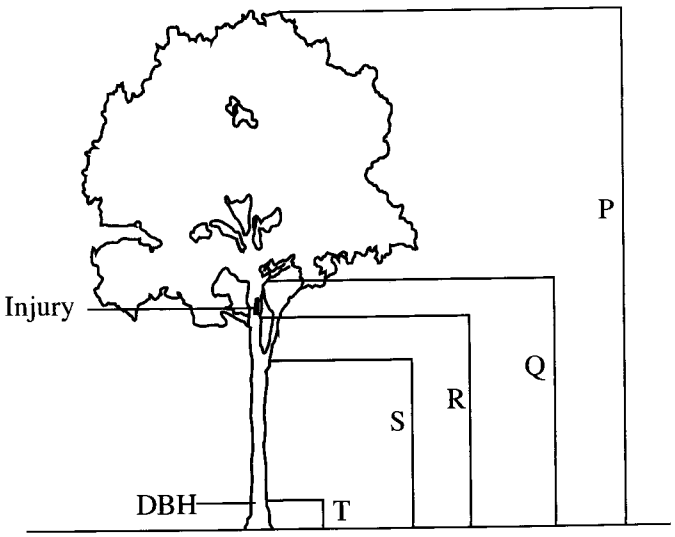
(2) .....

(ii) State **two** main limitations of a sprinkler irrigation system.

(1) .....

(2) .....

(D) Use the following diagram to answer questions (i) to (iii).
P, Q, R, S and T are different types of heights measured in forest mensuration.



(i) What is the commercially important height of the timber tree shown in the above diagram?

.....

(ii) State the reason for your answer in above.

.....

(iii) What is the value of 'T' (in meters) used in Sri Lanka?

.....

[see page six

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

Do not write in this column

P Q

(i) Of the above two diagrams, what is the right way of lifting a weight?

.....

(ii) If he lifts the weight in the wrong way, what type of hazard he may be subjected to?

.....

(F) Clearly underline the **correct** phrase given in the parenthesis in the following sentences.

(i) Foliage plays an important role in floral arrangements. In floral arrangements, **(yellow/green/variegated)** foliage provides a dark background to highlight the bright colours of flowers.

(ii) Foliage is typically **(more expensive than/ same as cost of/ less expensive than)** flowers.

(iii) In floral arrangements, foliage is mainly used **(to add more colour/ as a filler/ to enhance the shelf-life).**

(iv) The height of the floral arrangement should be **(half/ one and half times/three times)** the height of the container.

(v) In order to keep the flowers fresh for a longer period, mix 3 table spoons of **(sugar/ salt/ liquid soap)** with 1 liter of lukewarm water and add to the container.

Q3

75

4. (A) Following are some statements regarding the use of multimeter. State whether each statement is true **(T)** or false **(F)**

Statement	**True (T) or False (F)**
(i) While testing voltage, the multimeter is connected to the tested component in a parallel connection.	
(ii) When testing current, you must disconnect power to receive a proper reading.	
(iii) To perform a resistance test, you must connect the multimeter to the component in series.	

(B) Fill in the blanks in the sentences from (i) to (iii) with a suitable term selected from among the terms given below

Voltage, Unipolar, Resistance, Bipolar, Candela

(i) Charge is .....

(ii) The energy per unit charge is called the .....

(iii) The unit to measure luminous intensity is .....

[see page seven

Do not write in this column

(C) Microcontrollers are mainly used in automatically controlled devices. In addition to serial and parallel ports and timers what are the other **four** basic components a microcontroller must consist of?

(i) .....

(ii) .....

(iii) .....

(iv) .....

(D) In the rubber industry, it is common to vulcanize the products.

(i) What is vulcanization?

.....

.....

.....

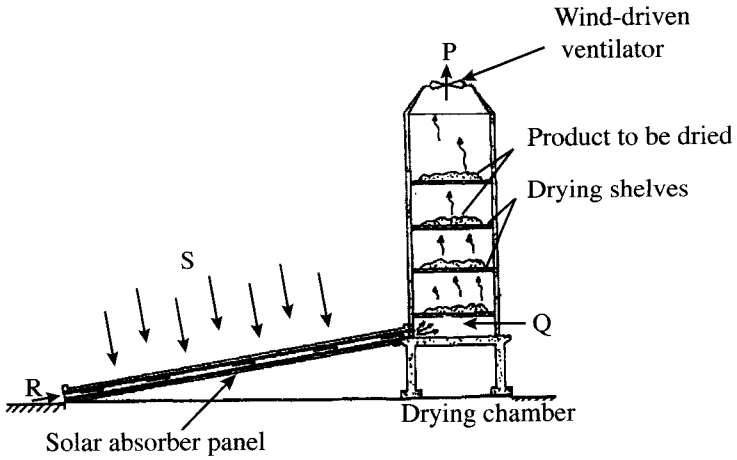
(ii) What is the main purpose of vulcanization of rubber?

.....

(iii) Why is Sulphur added to rubber during vulcanization?

.....

(E) Use the following diagram of solar dryer to answer questions (i) and (ii).



(i) Match labels P, Q, R, and S shown on above diagram with following phrases

Phrase	Label
(1) Fresh air	.....
(2) Solar radiation	.....
(3) Hot air	.....
(4) Moist hot air	.....

(ii) Name a vegetable that can be dried using above solar dryer.

.....

(F) Microfinance institutes provide financial services to poor and low-income clients. State **two** main advantages of microfinance system to low income clients.

(i).....

(ii).....

Q4

75

* *

[see page eight

නව නිර්දේශය / புதிய பாடத்திட்டம் / New Syllabus

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

ජෛවපද්ධති තාක්ෂණවේදය II
உயிர்முறைமைகள் தொழினுட்பவியல் II
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.*
* ***Use of non-programmable calculators is allowed.***

5. (a) Describe the different methods of layering of plants.

(b) Explain the steps in the process of making green tea using a flow chart.

(c) Describe the factors to be considered in selecting a water pump for irrigation purposes.

6. (a) Explain how soil texture and soil structure are important for biosystems.

(b) Describe the facts to be considered in feeding the food fish, rearing in a fish pond.

(c) Describe the different methods of preserving timber.

7. (a) Explain the important steps in broiler meat processing, mentioning the objective of carrying out each step.

(b) Describe the major constraints of growing crops in a polytunnel.

(c) If a person wants to commence a meat processing industry, state the main supporting services related to his/her business with their importance.

8. (a) Explain the importance of edible landscaping for domestic food security.

(b) Describe the food preservation principles found in traditional food preservation methods.

(c) A person bought an electric kettle having the power of 1800 W. It is connected to the main current having 230V voltage.

(i) Calculate the current in the coil of the kettle.

(ii) When the kettle filled with water was connected to the wall plug, switched on and heated up for 2 minutes, the fuse of the circuit was melted. When he checked the circuit, he could not find any fault in the circuit but he noticed that the rating of the melted fuse is 5A.

(1) Calculate the total amount of energy transferred by the kettle during the 2 minutes.

(2) What could be the reason for melting the fuse?

(3) If he is having fuses rating 1A, 5A, 10A and 13A, which one is the most suitable fuse to use for this circuit?

(4) What is the reason to select the above fuse?

9. (a) Describe the importance of soft landscape elements in landscape designing.

(b) Describe the procedure of using an auto level in surveying.

(c) Describe different tests that are used to find out the sensory perception of a new food product.

10. (a) Describe how to minimize the **nonpoint** source water pollution.

(b) Describe the different types of harrows used in land preparation.

(c) Describe the role of sensors and actuators in a control system.

* * *