

கிடை ம கிடைக்கி அரிர்வி/முழுப் பதிப்புரிமையுடையது/All Rights Reserved]

Department of Examinations, Sri Lanka

අධ්‍යාපන පොදු සහතික පත්‍ර (රුසස් පෙළ) විභාගය, 2021(2022) කළුවිප් පොතුත් තරාතරුප පත්තිර (ශ්‍යර් තරු)ප පරිශ්‍යාස, 2021(2022) General Certificate of Education (Adv. Level) Examination, 2021(2022)

கேள்வப்பட்டதிரு காஷ்டுகளுக்குடைய  
உயிர்முறைமைகள் தொழில்நுட்பவியல்  
**Biosystems Technology**

66 E I

பூர்வ நேரம்  
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 (x) in accordance with the instructions given at the back of the answer sheet*.
- \* Non programmable calculators are allowed to use.

1. The type of nursery bed suitable for the rainy season is,

- (1) flat bed. (2) raised bed.
- (3) furrow type bed. (4) sunken bed.
- (5) thatched roofed bed.

2. Goldfish is,

- (1) an ovoviparous. (2) an egg scatterer.
- (3) an egg depositor. (4) a mouth brooder.
- (5) a bubble nest builder.

3. The group of fungi which is responsible for the production of aflatoxin in food items is

- (1) *Mucor*. (2) *Fusarium*. (3) *Aspergillus*. (4) *Salmonella*. (5) *Penicillium*.

4. In food packages, a silica gel sachet is used to control,

- (1) oxygen. (2) ethylene.
- (3) moisture. (4) discoloration of food.
- (5) carbon dioxide.

5. Head rice recovery in parboiled paddy milling compared to raw paddy milling is,

- (1) low. (2) high.
- (3) same. (4) sometimes low.
- (5) sometimes high.

6. An example for a semi-permanent, fully protected plant house is a

- (1) net house. (2) polytunnel.
- (3) green house. (4) rain shelter.
- (5) thatched house.

7. In a centrifugal pump the liquid enters and leaves the pump from the,

- (1) side and top, respectively. (2) center and top, respectively.
- (3) top and center, respectively. (4) bottom and center, respectively.
- (5) center and bottom, respectively.

8. Gerbera is very popular and widely used as a decorative garden plant or as cut flowers. Gerbera is propagated mainly by,

- seeds.
- tubers.
- suckers.
- leaf cuttings.
- stem cuttings.

9. One of the main advantages of solar panels is they

- are cheap.
- are efficient.
- need little space.
- produce clean energy.
- do not need rechargeable batteries.

10. In municipal solid waste management, the best practice to implement by the residents in an apartment complex is,

- burning.
- storage.
- disposal.
- recycling.
- source reduction.

11. The main crop cultivated in Alluvial and Low Humic Gley (LHG) soils is,

- rice.
- taro.
- manioc.
- maize.
- cowpea.

12. Public potable water supply should be frequently tested for,

- pH.
- chloride.
- harmful bacteria.
- total dissolved solids.
- electrical conductivity.

13. The most suitable propagation method to obtain disease free planting material is,

- grafting.
- budding.
- layering.
- stem cuttings.
- micro-propagation.

14. In poultry industry, obtaining clean eggs is important. The most suitable rearing method to obtain clean eggs is,

- deep litter system.
- free range system.
- slatted floor system.
- battery cage system.
- semi-intensive system.

15. In the broiler meat production process, gas torch is used to

- scald the carcass.
- disinfect the carcass.
- defeather the carcass.
- smoke the chicken meat.
- remove the pin-feathers.

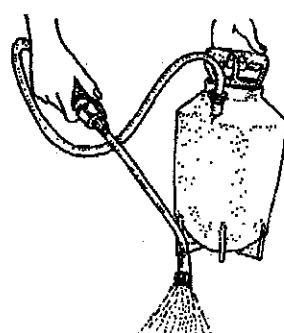
- Use the following diagram to answer question 16.

16. The sprayer shown in the this diagram is more suitable to apply pesticides to,

- rice fields.
- maize fields.
- indoor plants.
- fruit trees in a home garden.
- vegetables and flower plants in a home garden.

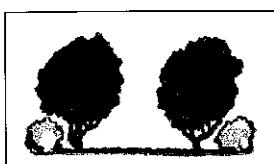
17. The most appropriate primary land preparation implement for a hard soil with rocks and stubbles is,

- sub soiler.
- disk plough.
- light iron plough.
- moldboard plough.
- Japanese reversible plough.

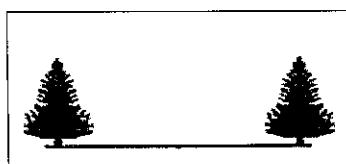


18. If an electrical bulb draws 10 A current when connected to a 230 V wall outlet, the resistance of bulb should be,  
 (1) 0.043  $\Omega$ .      (2) 0.43  $\Omega$ .      (3) 4.3  $\Omega$ .      (4) 23  $\Omega$ .      (5) 2300  $\Omega$ .

19. Balance is one of the main concepts used in landscape designing to ensure relaxing and free flowing. The asymmetrical balance in a landscape design is correctly shown in,



(1)



(2)



(3)



(4)



(5)

20. In the cut flower industry, petioles are treated with chemicals to extend their shelf-life. In this process, Silver Nitrate ( $\text{AgNO}_3$ ) is mainly used,  
 (1) to maintain pH.      (2) as an antioxidant.  
 (3) to destroy microbes.      (4) as a bleaching agent.  
 (5) to reduce ethylene production.

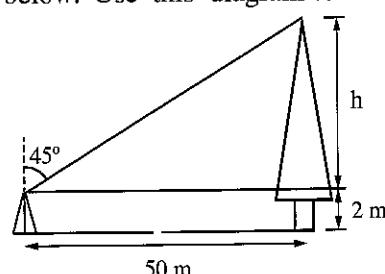
21. Cleaner production is a,

(1) profit maximization strategy.  
 (2) passive environmental strategy.  
 (3) reactive environmental strategy.  
 (4) proactive environmental strategy.  
 (5) labour intensive production strategy.

- Measurement of the height of a tree is given in the diagram below. Use this diagram to answer question 22.

22. The height of the tree should be

(1) 48 m.      (2) 49 m.  
 (3) 50 m.      (4) 52 m.  
 (5) 54 m.



23. Smaller contour intervals are used to draw a contour map when

(1) clearing a virgin forest.  
 (2) cut and filling is required.  
 (3) the land is more or less flat.  
 (4) the land has a uniform slope.  
 (5) the time available to draw the map is shorter.

24. Water pollution has become a major problem in the world today. Some of the most common sources of water pollution in Sri Lanka are,

(1) animal bathing, use of agrochemicals and oil spills.  
 (2) oil spills, discharge of municipal sewage and marine dumping.  
 (3) human bathing, animal bathing and marine dumping.  
 (4) discharge of municipal sewage, use of agrochemicals and industrial discharge.  
 (5) discharge of municipal sewage, human bathing and industrial discharge.

25. Rancidity of fats in lipid rich foods takes place mainly due to,

- oxidation of fatty acids.
- reduction of fatty acids.
- degradation of fatty acids.
- hydrogenation of unsaturated fatty acids.
- dehydrogenation of saturated fatty acids.

26. Pasteurized foods,

- can be stored in the room temperature.
- can be stored in an air-conditioned room.
- should be stored in a refrigerator below 10°C.
- should be stored in a deep freezer below -5°C.
- should be stored without exposing to direct sunlight.

27. In a supermarket, after washing fruits, inedible and unwanted parts were removed, sliced or chopped, antioxidants were added, packed in a styrofoam tray and covered with transparent flexible film. This process can be best explained as,

- sorting.
- grading.
- enrichment.
- fortification.
- minimal processing.

28. In a hydroponic system, hydroponic media need to be changed frequently mainly because,

- pH and EC of the solution change rapidly.
- nutrients in the solution become insoluble.
- nutrient content in the solution decreases rapidly.
- discoloration of the solution takes place due to oxidation.
- concentration in the solution increases due to evapotranspiration.

29. In a power transmission system of a tractor, the clutch is mainly used to,

- increase the power/ torque at axle shaft.
- change the speed, engine power or moving direction.
- turn the power coming from the gear box, by a 90° angle.
- connect the power take-off shaft to the engine at the time of start.
- disconnect the engine power with the rest of the power transmission system.

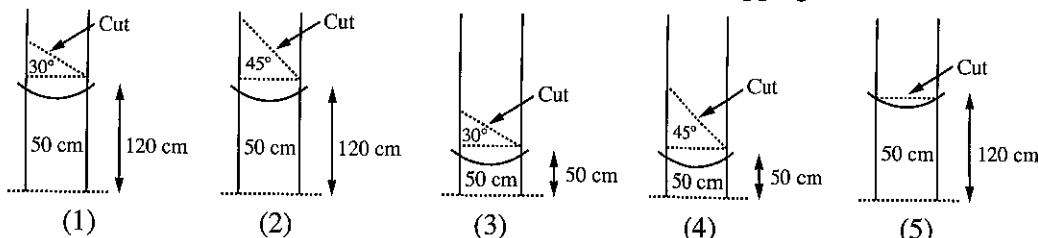
30. The major function of the cam shaft of an internal combustion engine is to,

- pressurize the air fuel mixture.
- transmit the power to the crank shaft.
- operate the intake and exhaust valves.
- keep the engine running during idle running.
- receive the power from the piston through the connecting rod.

31. A person who visited a timber store, found a highly durable timber having the highest density among the timbers found in that timber store. He also found that the heartwood of this timber is cream-coloured to golden yellow. Timber dealer told him that it will gradually turn to brown with age. Based on the above description, this timber can be best identified as,

- Jak.
- Teak.
- Ebony.
- Arjuna (Kumbuk).
- Satinwood (Burutha).

32. The line drawing showing the correct method of rubber tree tapping for latex extraction would be,



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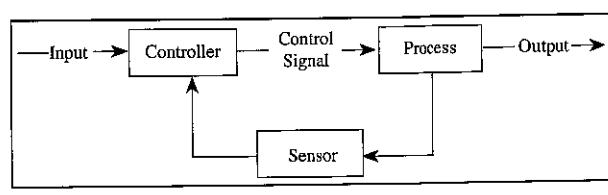
33. Activated carbon can be produced by burning of coconut shells,

- (1) under low oxygen and low temperature.
- (2) under high oxygen and low temperature.
- (3) under low oxygen and high temperature.
- (4) under high oxygen and high temperature.
- (5) in open air without temperature control.

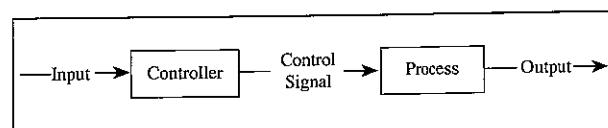
34. A good sensor in an electronic circuit should be,

- (1) highly sensitive to the measured property and insensitive to other application properties.
- (2) insensitive and show zero influence to the measured property.
- (3) insensitive to the measured property and highly sensitive to other application properties.
- (4) highly sensitive to the measured property and less sensitive to other application properties.
- (5) less sensitive and show zero influence to the measured property.

● Use the following diagrams to answer question 35.



P



Q

35. Of above diagrams,

- (1) both P and Q are not control systems.
- (2) both P and Q are open loop control systems.
- (3) both P and Q are close loop control systems.
- (4) P is a close loop control system and Q is an open loop control system.
- (5) P is an open loop control system and Q is a close loop control system.

36. During the tea manufacturing process, the main objective of withering of tea leaves is to,

- (1) improve the oxidation process.
- (2) inactivate the enzyme reactions.
- (3) improve the flavour of the made tea.
- (4) improve the colour of the made tea.
- (5) reduce the moisture content of the tea leaves.

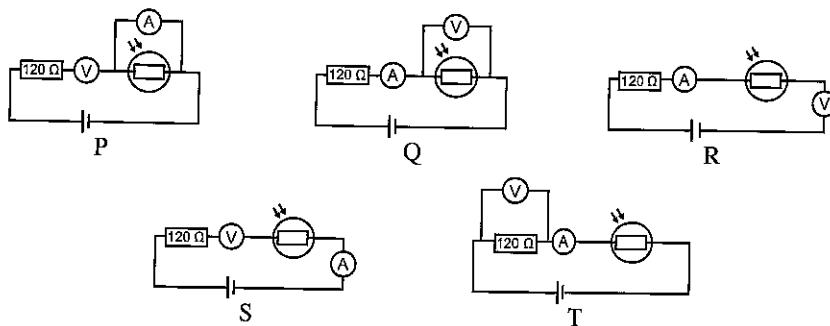
37. Before measuring resistance, as an initial setting,

- (1) a multimeter should be short circuited and adjusted till the meter reads zero resistance.
- (2) a multimeter should be open circuited and adjusted till the meter displays full scale current.
- (3) test leads of the multimeter should be disconnected from the circuit and adjusted till the meter reads zero resistance.
- (4) red test lead of the multimeter should be connected to the circuit while black test lead remains unconnected and adjusted till the meter reads zero resistance.
- (5) black test lead of the multimeter should be connected to the circuit while red test lead remains unconnected and adjusted till the meter reads zero resistance.

38. Breadboard is,

- (1) used to design or test electronic circuits.
- (2) used as a temporary binary storage area.
- (3) mainly used to solder the components of a circuit.
- (4) extremely reliable and circuits made on breadboards will last for years.
- (5) used in mass production of identical circuits easily and cost effectively.

- A teacher asked her students to draw a circuit diagram to measure the voltage and current across a light-dependent resistor (LDR) connected in series with a  $120\Omega$  resistor and a battery. Circuit diagrams drawn by 5 students are shown in the following diagrams. Use these diagrams to answer question 39.



39. Of the above diagrams, the correct circuit diagram to measure the voltage and current across the LDR would be,

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

40. Following are three statements on stand alone wind turbines used to generate electricity.

- A - Generated electricity is stored in batteries.
- B - The electricity stored in these batteries is released only as an alternating current.
- C - Overcharging can damage these batteries.

Of the above, the correct statement/s would be,

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

41. An entrepreneur decided to conduct a market survey on consumption of yoghurt before commencing a yoghurt making factory in a particular area. During his market survey he collected both primary and secondary data. An example for the source of his secondary data would be,

- (1) collecting information through a questionnaire.
- (2) meeting customers and discussing individually.
- (3) referring research articles on yoghurt consumption.
- (4) observing the behaviour of customers through CCTV cameras.
- (5) conducting video conferences through Mobile Apps.

42. Following are three statements regarding weather and climate.

- A - Weather refers to short term atmospheric conditions.
- B - Climate is the weather of a specific region averaged over a long period of time.
- C - Both weather and climate include the same atmospheric elements.

Of the above, the correct statement/s would be,

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

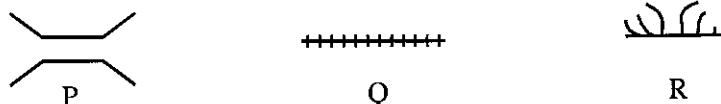
43. A student made following observations on the soil in his school garden.

- Pooling and puddling of water on the surface during the rainy season.
- Stunted growth of plants.
- Shallow rooting of trees.
- Too hard to drive a shovel into the soil.

This soil can be best explained as,

(1) a sandy soil. (2) a loamy soil.  
 (3) a porous soil. (4) a compacted soil.  
 (5) an ill-drained soil.

● Some symbols used in maps are given in the following diagram. Use this diagram to answer question 44.



44. The symbols P, Q and R in the above diagram represent,

(1) bridge, railway line and marsh, respectively.  
 (2) bridge, footpath and paddy field, respectively.  
 (3) aquifer, railway line and marsh, respectively.  
 (4) bridge, railway line and paddy field, respectively.  
 (5) aqueduct, footpath and paddy field, respectively.

45. Following are two statements on pumping of water from a confined aquifer.

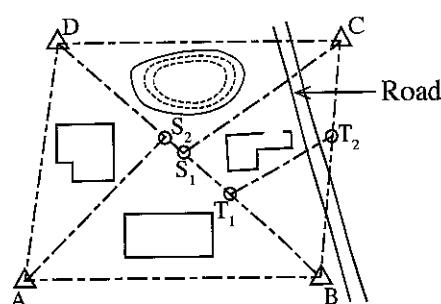
A - Water yield decreases when recharge rate is lower than the pumping rate.

B - Continuous water pumping can be obtained by installing the pump at a lower place in the groundwater well.

Of the above statements,

(1) both A and B are correct.  
 (2) A is correct but B is incorrect.  
 (3) B is correct but A is incorrect.  
 (4) A and B are correct and B further explains A.  
 (5) A and B are correct and A further explains B.

● Chain surveying map of a land is shown in the following diagram. Use this diagram to answer the question 46.



46. The main survey lines in the above chain surveying map are,

(1) AS<sub>2</sub>, CS<sub>1</sub> and T<sub>1</sub>T<sub>2</sub>.  
 (2) AB, AD, BD and CD.  
 (3) AB, AD, BC and CD.  
 (4) AB, BC, BD and AD.  
 (5) AD, BD, BC and CD.

47. Following the proper procedure in feeding the food fish reared in a pond is important. A feed amount equal to

- (1) 5% of the body weight should be spread on the surface of the pond everyday.
- (2) 10% of the body weight should be spread on the surface of the pond everyday.
- (3) 5% of the body weight should be provided to the same place in the pond everyday.
- (4) 10% of the body weight should be provided to the same place in the pond everyday.
- (5) 7.5% of the body weight should be provided to several places in the pond everyday.

48. Following are three statements regarding cow milk production.

A - Somatic cell count in milk is an indicator of udder health.  
 B - Clotting of milk during boiling can be due to bacterial contamination.  
 C - Udder infection reduces the somatic cell count in milk.

Of the above,

- (1) A and B are correct. (2) A and C are correct.
- (3) B and C are correct. (4) A and B are correct and B explains A.
- (5) A and C are correct and C explains A.

49. Few steps recommended by the Sri Lankan health authorities to cope with the COVID-19 pandemic are as follows.

A - Wearing face masks  
 B - Adopting work rosters with minimum number of workers  
 C - Covering counters with polythene shields  
 D - Introducing robotic devices to perform high risk tasks

According to the hazard prevention hierarchy, the above A, B, C and D steps can be categorized as,

- (1) an engineering control, substitution, elimination and administrative control, respectively.
- (2) use of personal protective equipment, substitution, elimination and engineering control, respectively.
- (3) elimination, substitution, use of personal protective equipment and engineering control, respectively.
- (4) substitution, administrative control, engineering control and use of personal protective equipment, respectively.
- (5) use of personal protective equipment, administrative control, engineering control and substitution, respectively.

50. Following are three statements about the drip irrigation system.

A - The difference of discharge rate between the first and last dripper along a lateral should be limited to 10%.  
 B - On-line drippers are commonly used for crops with close spacing (vegetables).  
 C - Among all methods of irrigation, drip irrigation performs the highest water application uniformly.

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.

\* \* \*

# Department of Examinations, Sri Lanka

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කළුවිප් පොතුත් තුරාතුරුප පත්තිර (ශ්‍යාරු තරු)ප පරිශ්‍යාස, 2021(2022)  
General Certificate of Education (Adv. Level) Examination, 2021(2022)

ஏவெப்பதை தாங்களுக்கிடைய்  
உயிர்முறைமைகள் தொழில்நுட்பவியல்  
**Biosystems Technology**

66 E II

ஏடு குறையி  
மூன்று மணித்தியாலம்  
*Three hours*

අමතර කියවේමි කාලය	- මතින්න 10 ඒ
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<b>Additional Reading Time</b>	<b>10 minutes</b>

**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 - 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.

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

<b>Total Marks</b>	
In numbers	
In words	
<b>Code Numbers</b>	
Marking Examiner 1	
Marking Examiner 2	
Marks checked by	
Supervised by	

**PART A – Structured Essay**

*Answer all four questions on this paper itself.  
(Each question carries 75 marks.)*

1. (A) A sketch of an automated weather station is shown below. Use this diagram to answer questions (i) and (ii).

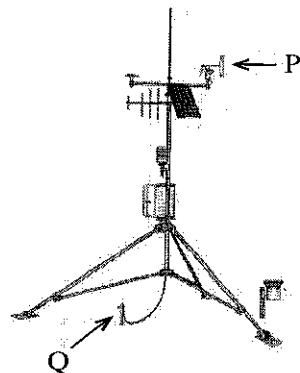
(i) Name components P and Q in this diagram.

(1) P - .....

(2) Q - .....

(ii) State the purpose of having component Q in an automated weather station.

.....  
.....



Do not write in this column

(B) The soil properties play an important role in maintaining ecosystem health.

(i) State **two** soil physical properties important in maintaining ecosystem productivity.

(1) .....

(2) .....

(ii) State **two** reasons why soil is important for plant growth.

(1) .....

(2) .....

(C) Edible landscaping is the use of food plants as design features in a landscape.

(i) State **three** benefits of edible landscaping.

(1) .....

(2) .....

(3) .....

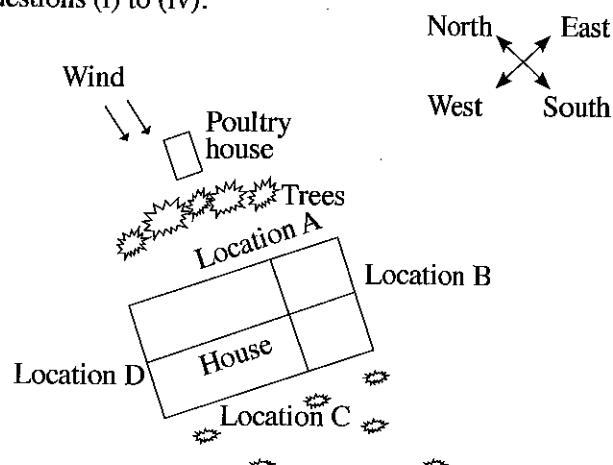
(ii) State **one** food crop each that is suited for growing in full shade, moderate shade and no shade conditions.

(1) Full shade - .....

(2) Moderate shade - .....

(3) No shade - .....

(D) Following diagram is a landscape plan developed by a student for his home garden. Use this diagram to answer questions (i) to (iv).



(i) State **two** main advantages of having trees in location A in the plan.

(1) .....

(2) .....

(ii) Which would be the most suitable location to be identified as the front yard?  
.....

(iii) Which would be the most suitable location for flowering plants?  
.....

(iv) Which would be the most suitable location for leafy vegetables?  
.....

(E) Timber seasoning is the process of drying timber to remove the bound moisture contained in the timber cells.

(i) State **two** most common timber seasoning methods used in Sri Lanka.

(1) .....

(2) .....

(ii) State **two** main advantages of seasoning the timber.

(1) .....

(2) .....

(iii) State an important step needed to be taken to minimize the warping of timber during the seasoning.  
.....

Q1

75

2. (A) Levelling is a process of determining the height of one level relative to another. It is used in planning engineering works such as construction of dams, irrigation channels, building etc.

(i) State **two** commonly used levelling methods.

(1) .....

(2) .....

(ii) State two errors that commonly occur during levelling and a technique to avoid/ minimize each error.

Error	Technique to avoid/ minimize the error
-------	--

(1) .....

(ii) .....

(iii) What is the purpose of taking backsight reading in levelling?  
.....  
.....  
.....

(iv) Name the datum surface used in Sri Lanka for land surveying and levelling.  
.....  
.....

(B) Hardness of water is mainly due to the high amount of dissolved ions in water.

(i) Name **two** ions that cause permanent hardness of water.

(1) .....

(2) .....

(ii) State a method to remove temporary hardness in water.

.....

(iii) Name the most common drinking water source in Sri Lanka where hardness of water is very much prevalent.

.....

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column

(C) There are many ways to produce quality planting materials.

(i) Nursery is a place where plants are propagated and grown to a desired age. List **two** commercially used nursery containers.

(1) .....

(2) .....

(ii) When a student visited one of her relative's place, she found a lime tree in that home garden bearing a lot of fruits. She wanted to have an early bearing similar type of lime tree in her home garden too. What is the most suitable method of propagation to fulfil her ambition?

.....

(iii) There are certain equipment which are essential for a tissue culture laboratory. State the main purpose of each of the following equipment in tissue culture.

Equipment	Purpose of use
(1) Autoclave	.....
(2) Hot plate with magnetic stirrer	.....
(3) Surgical blade	.....
(4) Oven	.....

(D) Controlled Environment Agriculture is growing crops in a protected environment by artificially providing optimal conditions to improve growth, yield and quality of harvest.

(i) What are the mechanisms adapted in a controlled environment agriculture system to control following environmental factors?

(1) Temperature .....

(2) Light .....

(3) Humidity .....

(ii) Growing plants without use of soil as a rooting medium means soilless culture. State **three** most common soilless media used to grow plants.

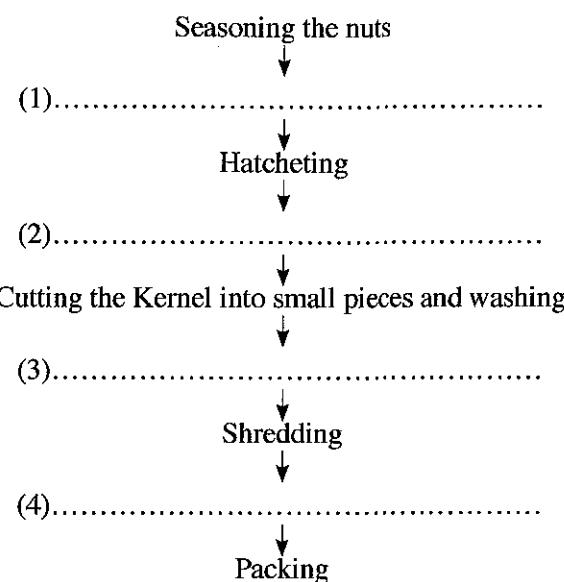
(1).....

(2).....

(3).....

(E) Production of desiccated coconut for export market is one of the major coconut-based industry in Sri Lanka.

(i) Fill in the blanks in the following flow chart of desiccated coconut production process.



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(ii) State a byproduct that can be produced using each of the following wastes generated in desiccated coconut production.

(1) Paring (Testa) .....

(2) Coconut shells .....

(iii) State a main use of desiccated coconut.

.....

(F) There are different kinds of risks that entrepreneurs take when they commence their business. State **two** risks a Sri Lankan entrepreneur may have to face.

Q2

75

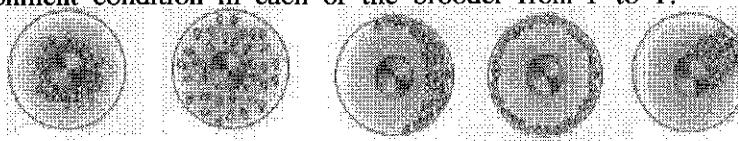
3. (A) More than 50% of the world food fish is produced as farmed fisheries. State a suitable fish species for each of the following fish ponds.

(i) Marine water pond .....

(ii) Brackish water pond .....

(iii) Fresh water pond .....

(B) Distribution of chicks in a brooder is a good indicator to get an idea about the environment inside the brooder. Following diagram shows the distribution pattern of chicks under different environment conditions inside a brooder. Using this diagram, state the environment condition in each of the brooder from P to T.



P

Q

R

S

T

(i) P .....

(ii) Q .....

(iii) R .....

(iv) S .....

(v) T .....

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(C) To protect the health and safety of workers dealing with COVID-19 activities, it is recommended to wear specific gears. State **three** important safety gears health workers should wear when dealing with COVID-19 activities.

(i).....

(ii).....

(iii).....

(D) Information regarding the baking of 30 loaves of breads using an electrical oven are given in tables A and B. Use this information to answer questions (i) to (v).

**Table A**

Raw material	Cost/kg (Rs)	Required amount (g)
Wheat flour	100.00	8250
Sugar	130.00	20
Yeast	800.00	100
Salt	75.00	115

**Table B**

Task	Required time (minutes)
Cleaning utensils	25
Weighing raw materials	20
Preparation of dough	20
Keep dough for leavening	40
Weighing and proofing	20
Baking	30
Cooling and packing	25

Cost for electricity (Rs) 75.00

Cost for water (Rs) 50.00

Cost for labour/ hour (Rs) 200.00

(i) Calculate the total direct cost of production.

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

(ii) Calculate the total indirect cost of production.

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

(iii) Calculate the total cost to produce a loaf of bread.

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

(iv) What is the importance of preparing the above cost estimate?

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

(v) What is the purpose of adding following ingredients to the mixture?

(1) Sugar .....

(2) Yeast .....

(E) A few symbols used on food labels to communicate some important information to consumers are shown in following diagrams. State the important message communicated through following symbols.



P



Q



R

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column

(i) P .....

(ii) Q .....

(iii) R .....

(F) Food adulteration is a very serious problem causing serious health risks to the consumers.

(i) Who is the officer responsible to receive complaints regarding the food adulteration in Sri Lanka.

.....

(ii) List two problems caused due to the adulteration of food.

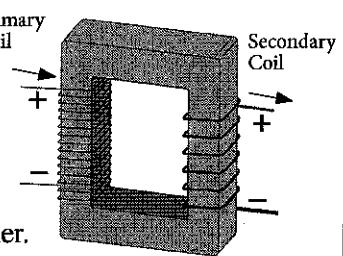
(1).....

(2).....

Q3

75

4. (A) A transformer is a component that transfers electrical energy from one electrical circuit to another circuit. Following is a schematic diagram of a transformer. Use this diagram to answer questions (i) to (iv).



(i) State whether this is a step-up or step-down transformer.

.....

(ii) Comment on the current flowing through the primary coil and the secondary coil of this transformer.

.....

(iii) Comment on the voltage in the primary coil and the secondary coil of this transformer.

.....

(iv) State an occasion where this type of transformer is commonly used.

.....

(B) In a house, 3 electric bulbs of 100W, 75W and 60W are connected in parallel to the main electric supply and each are lighted for 5 hours daily. In addition, 2 fans of 50W each are used for 10 hours daily and an electric kettle of 1000W is used for half an hour daily. Voltage of the main electric supply is constant at 220V throughout the period.

(i) Calculate the current drawn by the electric kettle when it is in operation.

.....

.....

.....

(ii) What is the energy consumed by the three electric bulbs in a day?

.....

.....

.....

(iii) What is the energy consumed by the two fans in a day?

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

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write  
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column

(iv) What is the energy consumed by the electric kettle in a day?

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

(v) What is the total energy (in kWh) consumed by all the electrical appliances in this house in the month of June?

.....  
.....

(vi) If the cost of electricity is Rs. 9.00/kWh, what will be the electricity bill of the month of June?

.....  
.....

(C) It is important to determine the total head of a centrifugal pump, prior to the installation of a centrifugal water pump for its smooth operation.

(i) List **three** main components to be considered in determining the total head of a centrifugal water pump.

(1).....  
(2).....  
(3).....

(ii) Of the above components, what is the most critical when using a submersible water pump?

.....

(D) An engine is a machine designed to convert energy from fuel into mechanical energy.

(i) State the main function of following components of an engine.

Engine component	Main function
(1) Piston	.....
(2) Crank shaft	.....
(3) Cam shaft	.....

(ii) State the reason for single cylinder engines to have large fly wheels compared to the multi-cylinder engines.

.....  
.....

(iii) State the main function of following components of a cooling system in an engine.

Component of the cooling system	Main function
(1) Thermostat valve	.....
(2) Radiator cap	.....
(3) Radiator fan	.....

Q4

75

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# Department of Examinations, Sri Lanka

අධ්‍යාපන පොදු සහතික පත්‍ර (රෝස්ස් පෙළ) විභාගය, 2021(2022)

கல்விப் பொதுத் துராதரப் பத்திரீ (உயர் தூ)ப் பரீட்சை, 2021(2022)

General Certificate of Education (Adv. Level) Examination, 2021(2022)

## ରେତପଦ୍ଧତି ନାକ୍ଷତ୍ରାବ୍ୟାପ୍ତି

உயிரமுறைமைகள் தொழில்நுட்பவியல்

## Biosystems Technology

II

66

E

III

## **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 basic steps in landscape designing.  
(b) Explain the importance of the use of renewable energy and its benefits to the biosystems.  
(c) Describe the procedure of producing Rubber products using dip-moulds.

6. (a) Describe the changes that should take place in transforming labour intensive livestock production into technology driven livestock production.  
(b) Explain the importance of soils for biosystems.  
(c) Describe the calibration procedure of a manual knapsack sprayer.

7. (a) Explain the impact of water pollution on aquatic ecosystems.  
(b) Describe the important steps of breeding neon tetra fish in an aquarium.  
(c) Describe the role of sensor, processor and actuator in a control system.

8. (a) With suitable examples, explain the enrichment and fortification processes practiced in food processing.  
(b) Describe the importance of automation for biosystems.  
(c) Describe the factors to be considered when selecting a scale for a survey plan.

9. (a) Name the different methods of sterilization of potting media used for nursery plants and describe the procedure adopted for one of the above method.  
(b) Describe the main types of freezing of foods.  
(c) Describe the impact of management on the success of an enterprise.

10. (a) Describe the basic layout of a typical drip irrigation system showing its main components.  
(b) Describe the main steps of making soap using essential oil.  
(c) Describe the major advantages of growing crops in a protected house, compared to the growing in open fields.

\*\*\*

