

නව නිර්දේශය/புதிய பாடத்திட்டம்/New Syllabus

NEW

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

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

තාක්ෂණවේදය සඳහා විද්‍යාව II
 தொழினுட்பவியலுக்கான விஞ்ஞானம் II
 Science for Technology II

67 E II

පැය තුනයි
 மூன்று மணித்தியாலம்
 Three hours

අමතර කියවීමේ 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 consists of 13 pages.
- * This question paper comprises of four Parts A, B, C and D. The time allotted for all parts is three hours.
- * Use of non-programmable calculators is allowed.

Part A - Structured Essay
 (Pages 2 - 7)

- * Answer all the 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.

Parts B, C and D - Essay
 (Pages 8 - 13)

- * Select minimum of one question from each of the parts B, C and D and answer four questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, tie all parts together so that Part A is on the top of Parts B, C and D before handing over to the supervisor.
- * You are permitted to remove only Parts B, C and D of the question paper from the examination hall.

For Examiners' Use Only

Part	Question Nos.	Marks Awarded
A	1	
	2	
	3	
	4	
B	5	
	6	
C	7	
	8	
D	9	
	10	
Total	In Numbers	
	In Words	

Code Numbers

Marking Examiner 1	
Marking Examiner 2	
Checked by	
Supervised by	

Part A – Structured Essay

Answer *all* questions on this paper itself.

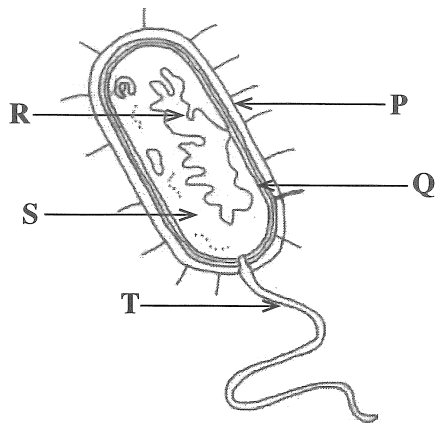
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1. (A) The cell is the basic unit of all living organisms. Based on the structure and organization, cells can be divided into two main groups.

(i) Name these **two** main groups of cells.

.....

(ii) What is the group of microorganisms shown in the following diagram? Name the parts labelled as P, Q, R, S and T.



(a) The group of microorganisms

.....

(b) P:

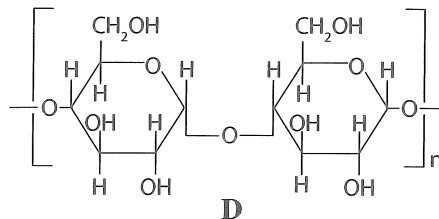
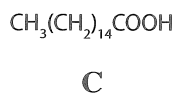
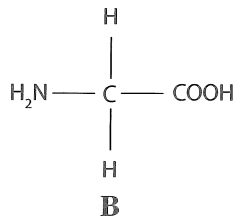
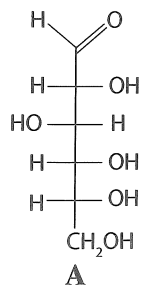
Q:

R:

S:

T:

(B) Four types of biomolecules that are used in different industries are given below. Answer the following questions based on the given biomolecules.



(i) What biomolecule/s contains/contain an aldehyde group as a functional group?

.....

(ii) What biomolecule/s contains/contain a carboxylic acid group as a functional group?

.....

(iii) Which biomolecule/s provides/provide a positive result for the iodine test?

.....

(iv) Name a suitable test to identify biomolecule **B**.

.....

(v) Identify what biomolecule or its derivative given above contains in each industrial product mentioned in the table. Write the letter that represents each identified biomolecule in the following table.

Industrial product	Letter that represents the biomolecule
cotton thread	
soap	
sugar	

(C) Bread is one of the most commonly produced products in the bakery industry. If the required ingredients are available, bread can also be produced at home.

(i) What is the microorganism used in the bakery industry?

.....

(ii) What is the raw material added to accelerate the growth of the microorganism in the process of bread production?

.....

(iii) Explain why the dough rises along with the activity of microorganism.

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

(iv) The bread develops a sour taste when the dough is kept for a long time for rising prior to baking. Explain the reason for this.

.....
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.....

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Q.1

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write
in this
column

2. (A) An experiment was conducted to determine the drying speed of an emulsion paint. Here a paint sample of 5.05 g was spread evenly on a plate and the mass of the paint sample was measured at 60 minute intervals. The results are given in the table, and the reason for the mass loss with the time is vaporization of water in the paint.

Time/min	Mass/g (30 °C)
0	5.05
60	4.71
120	4.50
180	4.35
240	4.24
300	4.18
360	4.15
420	4.15

- (i) What is meant by vaporization?

.....

- (ii) After 360 minutes, a constant mass of the paint sample was observed in the experiment. Calculate the mass of water evaporated from the paint sample.

.....

- (iii) Give the mass of water in the paint sample as a percentage.

.....

- (iv) Write **one** benefit of using water to produce emulsion paint.

.....

- (B) The physical transformation of water during the drying process of paint can be shown as below.

Water (liquid) \longrightarrow Water vapour (gas)

Four statements regarding the above physical transformation are given in the table below. Put a tick (✓) in front of the correct statements and a cross (×) in front of the incorrect statements.

	Statements	✓ or ×
(i)	The physical transformation of liquid water to water vapour is exothermic.	
(ii)	Energy of water molecules in the vapour phase is higher than that of the water molecules in the liquid phase.	
(iii)	Water molecules in the liquid phase are closely packed compared to the water molecules in the vapour phase.	
(iv)	Average speed of water molecules in the vapour phase is greater than that of the water molecules in the liquid phase.	

- (C) (i) Write **two** factors that affect the vaporization rate of water in the paint sample.

.....
.....

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(ii) Calculate the average rate of vaporization of water in the first six hours.

.....

(iii) Polymers are a group of raw materials used for the production of paint. Write **two** other groups of raw materials used in the paint industry.

.....

(iv) It is not suitable to apply a paint containing polyester as the polymeric material on a cement surface. Explain the reason for this?

.....

Q.2

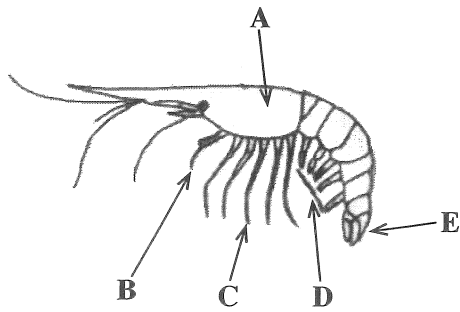
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3. (A) Prawn is an invertebrate animal that belongs to the phylum Arthropoda. Prawn farming is a profitable business in Sri Lanka.

(i) Write **one** structural feature that is used to classify prawn as an invertebrate.

.....

(ii) Name the parts labelled as A, B, C, D and E in the given diagram of a prawn.



Part	Name
A	
B	
C	
D	
E	

(iii) Write **one** reason for classifying the prawn under the phylum Arthropoda.

.....

(iv) Mention an economically important raw material that can be extracted from the prawn's exoskeleton.

.....

(v) Write **one** geographical feature that must be considered in establishing a prawn farm.

.....

(vi) Write **one** method of value addition that can be done in the processing of prawns for the international market.

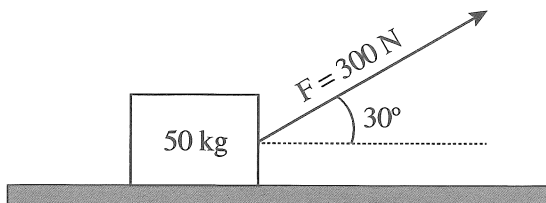
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(iii) Which point represents the limiting friction on the graph?

.....

(B) A person pulls a box of mass 50 kg along a frictionless horizontal floor using a non-extendable light rope which is inclined at an upward angle of 30° with the horizontal as shown in the figure. The person exerts a constant force of magnitude 300 N on the rope. (Consider $\sin 30^\circ = 0.50$ and $\cos 30^\circ = 0.87$)



(i) Mark on the above figure, the normal reaction and the gravitational force acting on the box.

(ii) Calculate the acceleration of the box.

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

(iii) Calculate the work done by the applied force when the box is moved by 2 m.

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

(iv) Consider that the above box is pulled with a light metal wire. If the metal wire is extended by 2 mm due to the applied force 300 N, calculate the elastic potential energy stored in the wire.

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Q.4

100

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