

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

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

විද්‍යාව II
விஞ்ஞானம் II
Science II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීමේ කාලය - මිනිත්තු 10 යි
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

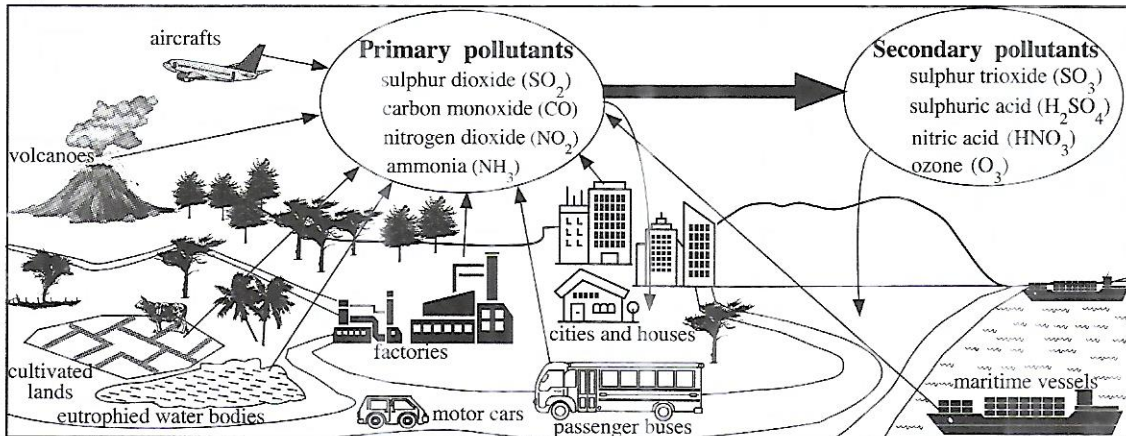
Use additional reading time to go through the question paper, select the questions you will answer and decide which of them you will prioritise.

Index Number:

- Instructions:**
- * Write your answers in neat handwriting.
 - * Answer the **four** questions in **Part A**, in the space provided.
 - * Of the five questions in **Part B** answer **three** questions only.
 - * After answering, tie **Part A** and the answer script of **Part B** together and hand over.

Part A

1. (A) The following figure indicates several common sources of pollutants and the gaseous pollutants produced by them. The primary pollutants indicated in it are the gaseous pollutants directly added to the atmosphere. The secondary pollutants produced from the primary pollutants undergoing chemical changes in the atmosphere are also indicated in the figure.



Select an **example** relevant to each of the following statements from the figure and fill in the blanks in the table.

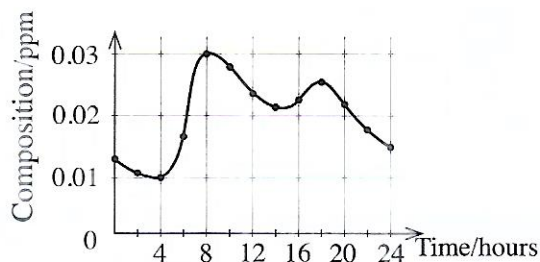
(i)	A pollutant source producing primary pollutants without human interference.	.....
(ii)	A secondary pollutant affecting living beings favourably in the upper regions of the atmosphere and unfavourably in the lower regions of the atmosphere.	.....
(iii)	A primary pollutant producing secondary pollutants which contribute to acid rains.	.....
(iv)	A primary pollutant with basic properties that liberates from the eutrophied water bodies.	.....
(v)	A secondary pollutant that falls on soil and contributes to provide a main nutrient essential for plant growth.	.....
(vi)	If the food mileage is shortened, the amount of gaseous pollutants released from this pollutant source is reduced.	.....
(vii)	If this mode of transport is selected, your carbon foot print during an inland tour can be minimized.	.....

(B) In a populated city, the atmospheric nitrogen dioxide gas (NO_2) composition was measured during a day starting from Sunday midnight to Monday midnight. The variation graph of the composition of NO_2 drawn using those data is given below. Answer the following questions based on the graph.

- (i) What is the maximum and minimum NO_2 composition existed on the relevant day?

maximum: minimum:

- (ii) In which hour of the day is the maximum NO_2 composition recorded?



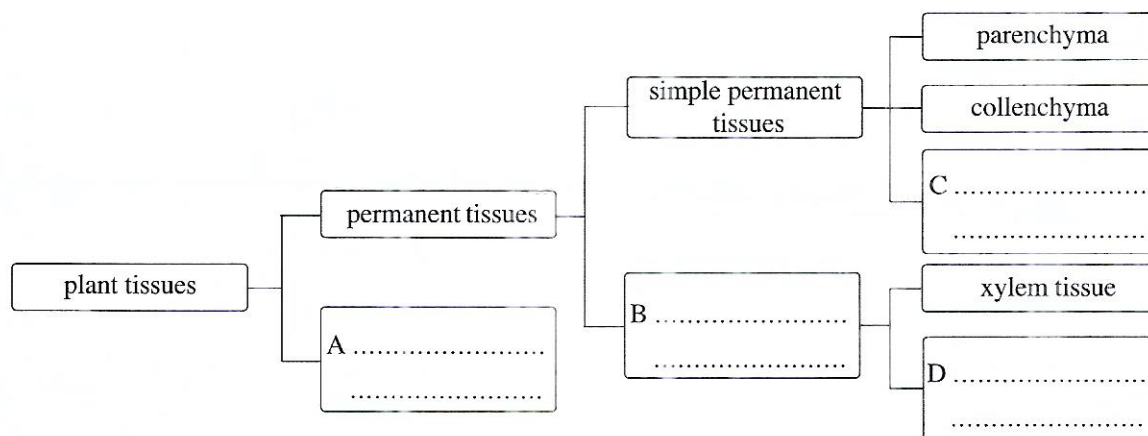
- (iii) According to the above graph, in the above city, two occasions are seen in which the NO_2 composition assumes a high value in a day. Give a reason for it.
- (iv) In the above city, the increase in the NO_2 composition in the forenoon is greater than that of the afternoon. Give a reason for it?
- (v) Name another primary gaseous pollutant which would indicate a variation that corresponds to the variation of NO_2 composition during the relevant day in the above city.

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2. (A) Given below is an incomplete table about four organelles existing in a cell and their main functions. Fill in the blanks and complete the table.

	Organelle	Function
(i)	Nucleus	.....
(ii)	.....	providing energy required for metabolic activities
(iii)	Golgi complex	.....
(iv)	.....	protein transport

(B) (i) An incomplete chart indicating the classification of plant tissues is shown below. Write the tissue types relevant to the boxes A, B, C and D on the dotted lines given and complete the table.



- (ii) What is the type of tissue in which photosynthesis occurs most?
- (iii) Name the type of tissue which contains sieve tube elements.

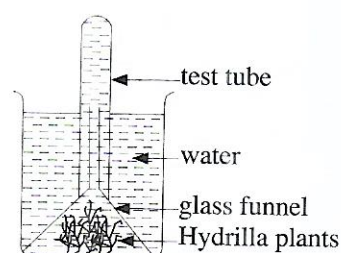
(C) An apparatus set by a group of students to investigate a product of photosynthesis is shown in the diagram.

(i) What is the gas collected in the test tube when this apparatus is kept in sunlight?

(ii) State a test that can be done to identify that gas and the observation you make during the test.

Test :

Observation :



(iii) A new apparatus similar to the above apparatus was made by putting water saturated with carbon dioxide gas instead of normal water.

(a) State an observation that could be expected with regard to the evolution of gas bubbles in the new apparatus when comparing with the evolution of gas bubbles in the first apparatus under similar environmental conditions.

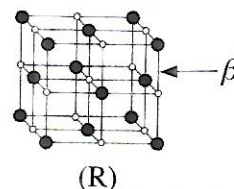
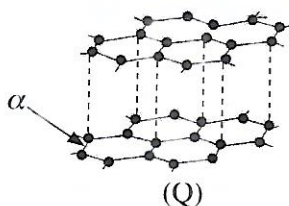
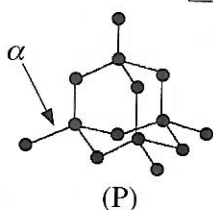
(b) Give reasons for the observation you mentioned above.

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3. (A) The following figures indicate the lattice structures of three solid substances P, Q and R.

(i) Identify them and fill in the relevant blanks selecting the names of those substances and the lattice structures from the box given below.

sodium chloride, diamond, graphite, ionic, atomic



substance :

substance :

substance :

lattice :

lattice : atomic

lattice :

(ii) Write the names of the chemical bonds labelled α and β in the lattice structures.

α :

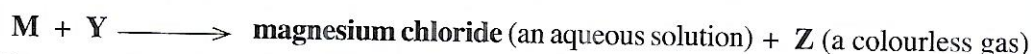
β :

(iii) Of the substances P, Q and R,

(a) which substance conducts electricity in the solid state?

(b) which substance has the highest hardness?

(B) Given below are two reactions in connection with the metal M.



(i) Identify M, X, Y and Z and write their names or chemical formulae on the dotted line.

M :

X :

Y :

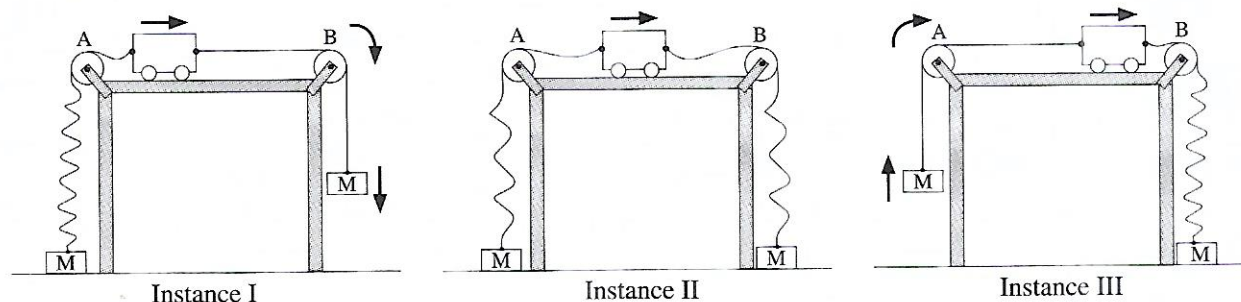
Z :

(ii) In compound X, the ionic form in which M exists is M^{2+} . Write the chemical symbol of the ionic form in which oxygen exists in that compound.

(iii) X is sparingly soluble in water. Which colour litmus papers give a colour change when testing that aqueous solution with litmus papers?

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4. (A) In an activity to demonstrate Newton's laws, a trolley connected to two equal masses M with strings is used. The figures show three instances in the activity. In those instances, the slack strings are represented by wavy lines while the taut strings are represented by straight lines. The strings are made to pass over two smooth pulleys A and B fixed to the two ends of a table. Arrows indicate the direction of motion of the trolley which smoothly moves on the horizontal table and the directions of motion of the masses.



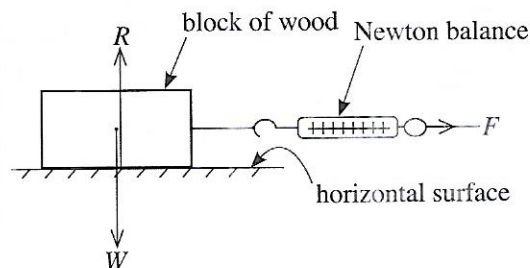
- (i) Inserting appropriately the terms given in the following box, complete the following table which describes the nature of motion of the trolley in the instances I, II and III.

uniform retardation, uniform acceleration, uniform velocity, Newton's first law, Newton's second law		
Instance	Nature of motion of the trolley	Newton's law that describes the nature of motion of the trolley
I
II
III	Newton's second law

- (ii) In one of the above instances, the trolley took 5 s to travel 50 cm on the table with uniform velocity. Find the uniform velocity with which the trolley moved.

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- (B) The figure shows a cuboidal block of wood used to examine how the frictional force between a horizontal surface and an object placed on it changes. The block of wood is connected to a Newton balance by a string and a horizontal, external force F is applied. The experiment is conducted by increasing the value of the force F gradually from zero.



- (i) Name the forces indicated by R and W .

R : W :

- (ii) The block of wood stays at rest until F is increased to a certain value from zero. By what name is the frictional force acting on the block of wood known before it starts to move?

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- (iii) At the moment the motion starts, the frictional force acting on the block of wood reaches the maximum value.

(a) What is the name of that maximum frictional force?

(b) Write **two** factors on which the magnitude of that frictional force depends.

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(c) Suggest a method that can be practically applied to change one factor you stated in (b) above.

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