Provincial Department – Northern Province

G.C.E (O/L)

Diagnostic Test – 2021

Science – II **Additional reading time – 10 minutes** **Time:-3 hours**

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

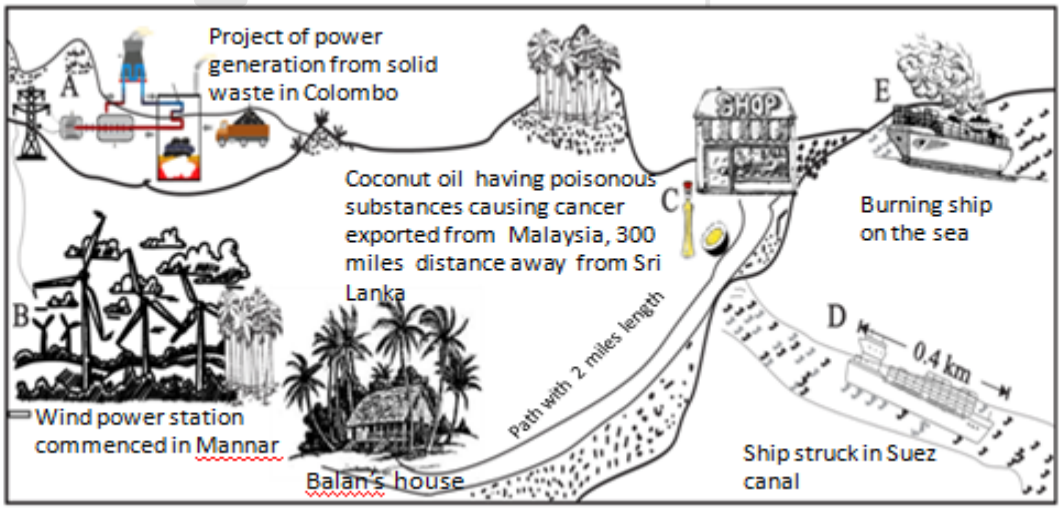
Index Number: .....

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 II (A)

1. Recently, Some major instances took place in Sri Lanka and Worldwide. They are considered as important issues, when analyzing them scientifically.

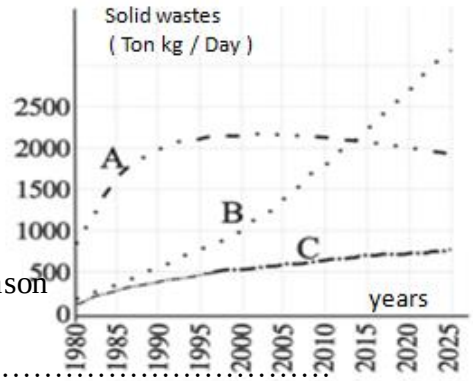


(A). 1. Which instance leads to sustainable development by using natural resource?

.....

2. In which 4 R management, the generation of electricity from the solid waste in the instance A will be included?
……
3. What is the food mile of Balan when consuming the coconut oil in the instance C ?
……
4. Write an activity will be made by Balan related with his surroundings, for reducing the food mile ?
……
5. State an unhygienic behavior of human, that is not mentioned in the figure, which causes cancer highly than the cancer caused by the chemical substance in the coconut oil?
……
6. I. Mention the major biological molecule which is in the coconut oil ?
……..
II. Say a non-communicable disease, that can be caused by high intake of food item which contains the above mentioned biological molecule ?
……
7. If the Ever Given Ship has sailed 1200km from one end to other end of Suez canal, what will be the total length of Suez canal ?
……
8. Mention a harmful effect to marine environment, if the crude oil mixed with sea water from the burnt ship E ?
……

(B). The amount of disposed solid waste into the sea from some countries is shown by the given graph. The population of the countries is nearly equal to each other.



I. Which country shows increment in disposal of waste? …….
II. In 1980, which country disposes more waste ?
……
III. How much of waste is disposed by the country C in kilograms in 2000 ? …….
IV. After 2005 , the total amount of waste materials disposed by the country A decreases. Give a major reason for it?
……
V. In 2020, the amount of waste materials disposed by the country B is in maximum amount. Write the reason that relates with the waste management?
……

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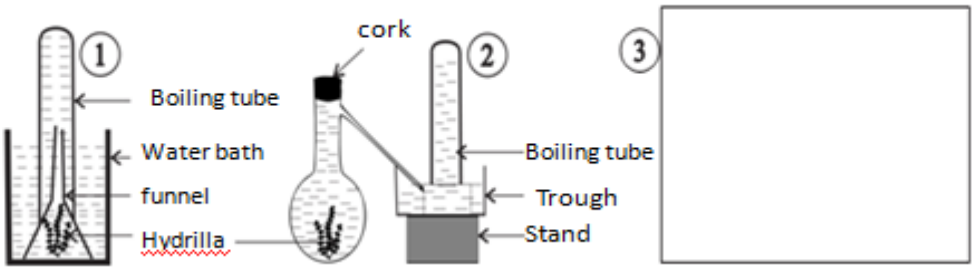
2. (A). The experimental setups arranged by two students to identify the gaseous product of photosynthesis in the same volume of water containing trough and round bottomed flask are shown below.



Both experimental setups are kept in the following places.

a. Normal sunlight b. bright sunlight c. dark

I. Write the ascending order of the amount of the collected oxygen gas in a , b and c, which are in the both setups kept in the above places ?

.....

II. Which factor that determines the rate of photosynthesis is suggested by comparing the amount of collected gas in the setups?

.....

III. When observing the setups 1 and 2 continuously, which are kept in the place b, In which setup gas bubbles are evolved for a long time comparatively?

.....

IV. The reason for the observation in question no – III is that an another factor which is important for the photosynthesis decreases in setup 2 than 1 comparatively. What is the factor ?

.....

V. Draw only the controlled experiment by using a potted plant in the laboratory in the box 3, that shows the factor in question no – IV is important for the photosynthesis ?

(B). Write the answers for the following questions based on the given plant and animal tissues only with the help of their given English letters.

A. Epithelial tissue B. Parenchyma tissue C. Xylem tissue

D. Sclerenchyma tissue E. Nervous tissue F. Cardiac muscle tissue

G. Phloem parenchyma tissue H. Smooth muscle tissue

1. Having spindle shaped cells ……
2. Found only in dicotyledonous plants ……
3. Perception of stimuli ……
4. Transmitting impulses ,……...
5. Conducting ascent of sap ……
6. The tissue having animal cells, which are non- fatigued. ……

(C).Fill up the uncompleted table related with the endocrine glands in our body.

	Gland	**Hormone**	**Function**
1.	Pancreas	……	Increasing the blood glucose level.
2.	……	Testosterone	Developing the secondary sexual characteristics in males
3.	Pituitary gland	…….	Increasing the absorption of water in kidney
4.	Pituitary gland	…….	Stimulating the development of graafian follicles from primary follicles in ovary

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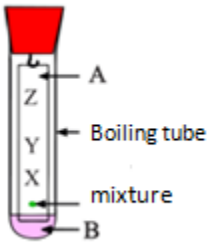
3. (A). Chromatography is one of the methods for the separation of components in a mixture.

1. How is called the given method of chromatography?
   ……
2. The method is used to separate the mixtures, which have a specific characteristic. What is it?
   ……..
3. Name the two phases A and B?
   A - …….
   B - …….
4. Write a solvent, which can be used in the phase B ?
   ……
5. In the components X,Y and Z in the mixture, Which can be highly attracted by paper ?
   ……
6. Say an instance, where the separation method is used ?
   ……



(B). Answer the following questions using only the symbols or their chemical formula of the given substances, which are on the laboratory table.

- Calcium carbonate	- Magnesium
- Sulphur	- Acetic acid
- Hydrochloric acid	- Sodium hydroxide
- Sulphuric acid	- Sodium

1. Called as battery acid - ……..
2. Used in drying gases - ……
3. Burning with blue flame - ……..
4. Burning with bright white flame and forming white residue - ……..
5. Burning with golden yellow flame - …….
6. Used in soap preparation - ……..

7. $X_{(s)} + 2\ HCl_{(aq)} - CaCl_{2(aq)} + H_2O_{(l)} + CO_{2\ (g)}$

I. Which is X? ……..

II. Write the balanced chemical decomposition reaction of X by using its true symbol?

……

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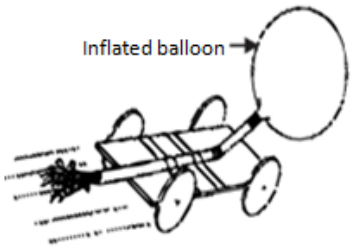
4. (A). A student has prepared a movable toy car using renewable energy resource for an invention competition. (the balloon is connected at east end of the toy car)



1. In which direction car moves? ……

2. According to which Newton's law, car moves ? ……..

3. Write the energy transformation takes place during the movement of the toy car? …….

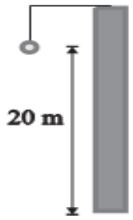
4. Mention a change that can be made in the toy car which related with the concept of friction to increase the moving distance?

……

5. The toy car started with $10ms^{-1}$ and became rest in 4s. Find the total distance moved by the car?

……...

(B). An iron ball having 20kg is hung 20m height from the ground by a rope. ($g = 10ms^{-2}$)



1. What are the forces acting on the ball, when is hung?
   ……
2. Indicate the balanced forces on the ball in the figure ?
3. Find the potential energy that is stored in the hung ball ?
   ……
4. After some time, the rope breaks down and the ball hit on the ground . At that moment,
   I. Find its velocity?
   ……..
   II. Calculate its momentum?
   ……..
   III. Draw the velocity – time graph roughly, for the motion of the ball from the moment of the rope break down and until it hit the ground ?
   ……..

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Part (II) B

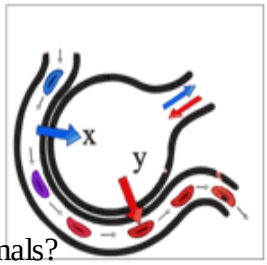
- Answer only **three** questions from the questions No**. 5,6,7,8** and **9.**

05. (A). The table below shows the organisms that are observed by some students in their surroundings. Answer the following questions based on the table.

Snake	Scorpion	Frog	Grass	Grass hopper	Snail	Millipede	Bat
1	3	4	1000	10	2	7	4

1. In which domain, all the organisms belong?
2. The invertebrates in the table are included in how many Phyla?
3. How many organisms are included in Phylum Arthropoda ?
4. Write a main similarity between snake and bat according to their body?
5. Which is a soft bodied organism?
6. If the binomial nomenclature of frog is HELIX POMATA. Write its name correctly?
7. I. Write a food chain with three links by using the above organisms?
   II. In an efficient food chain, the number of links is less than five. Give the reason?
   III. Build up a suitable number pyramid using the written food chain?

(B). The structure of the alveoli of human respiratory system is shown below.



1. Identify and name the gases x, y which are exchanged in the alveoli?
2. State an adaptation in the alveoli for efficient gaseous exchange?
3. Write the balanced chemical equation for the aerobic respiration in animals?
4. State another name for the anaerobic respiration that takes place in animals?
5. Give the reason for an incident of muscle pain and cramp, during a short-distance race without practices ?

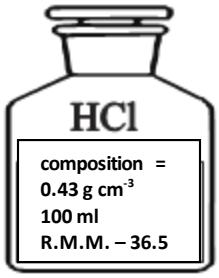
(C). Answer the following questions related with the blood tissue of human being.

- Red blood cell	- neutrophils	- monocytes	- basophils
- Platelets	- blood plasma	- haemoglobin	- Eosinophils
- Albumin	- glycerol	- uric acid	- urea

1. Which solid component of the blood is related with blood clotting?
2. Where will the nutrients of food be found?
3. What is the pigment, that is the reason for the red colour of blood?
4. Identify the non-granulocyte of white blood cell?
5. Which component is in high amount in blood based on volume?
6. Number of which component decreases in the blood , during affected by the diseases dengue and rat-bite fever ?
7. State a blood protein in blood tissue?

(20 marks)

06. (A). Some data are mentioned on the label of the bottle that containing HCl in the laboratory.



1. Give the composition of HCl in this bottle as mass / volume ratio ?
2. What do you understand by the above composition ?
3. Find the molar mass of HCl?
4. Calculate the concentration of HCl in the bottle in **mol dm^{-3}**?
5. Which is the main step to follow for diluting a concentrated acid in laboratory?
6. 40 ml HCl is dissolved in water to prepare 200ml of dilute Hydrochloric acid. Find the composition in V/V fraction?
7. What type of chemical bond is found among the atoms of HCl molecule?
8. If your hand is contacted with an acid accidently, what will you do as first-aid immediately?

(B). Some of the activities, conducted for identifying the acid, base and neutral substances in the laboratory and their observations are shown in the table,.

	Activity	Observation
1	Dipping blue litmus paper and red litmus paper in A separately	No colour changes in both.
2	Adding Phenolphthalein to B	No colour change.
3	Adding phenolphthalein to C	No colour change.
4	Adding methyl orange to D	Changed into yellow colour.
5	Reacting E with carbonate containing compound.	Delivered Carbon dioxide gas.

1. How is called the substances, which are used in the activities 1,2,3 and 4 for identifying acid, base and neutral substances?
2. Which is a neutral substance, that you can say confidently?
3. What substance forms OH^- ions in aqueous solution?
4. E is added with the same concentrated D and then the activity 1 is done to it. The same observation is there.

I. How is called the reaction that took place between the above two substances?

II. Write an instance in our day-to-day activities, where the above mentioned type of reaction is used?

(C). The standard symbol of element M is shown here.

$^{25}_{12}M$

1. How many electrons are in one atom of the element?
2. Write the electronic configuration of it?
3. In which group, the element is found in periodic table?
4. Write the chemical formula of the compound, which is formed by combining M with oxygen? (Don't use the true symbol of M)
5. What is the colour of the compound, which is formed due to the reaction between M and oxygen?

(20 marks)

07. (A).

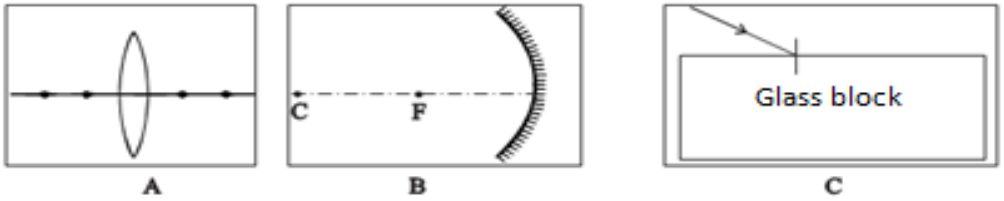
1. Which type of mechanical wave is formed in B?
2. Write a main difference between the electromagnetic wave and the mechanical wave?
3. The wave formed during 1s is in figure B.
   I. Name the parameters denoted by x and y?
   II. Find the frequency (a) of the wave?
   III. Write the relationship among the parameters a,v and x for calculating the velocity (v) of the wave?
   IV. Find the velocity of the wave, if the value of x is 0.1m?
4. Write the observation of the motion of a leaf on a still water surface, when drop a pebble into the still water surface?
5.
   I. Which type of mechanical wave is formed, when moving the free end of the slinky forward and backward?
   II. When moving the slinky forward and backward, the ribbon tied on it, did not displace. What do you say about the energy of particles and their displacement from the observation?

6. Which type of electromagnetic waves are used for the following purposes?

I. Identifying the broken bones.

II. Sending the signals to television sets from remote controls.

III. Check the hidden symbols in currency notes in the banks.



(B). 1. From the above optical elements,

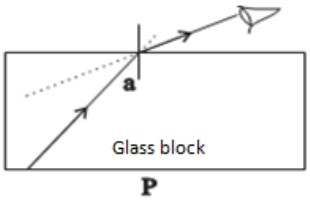
I. Which optical element may be used to form the real image by refraction of light?

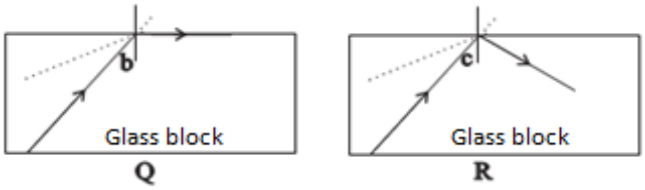
II. In a stage of simple microscope, that is prepared with A, enlarged and virtual image is formed. Draw the ray diagram for it?

2. Complete the ray diagram for the block of glass in figure C ?

3. The path of a light ray from a very closed pointed object with the glass block is shown in the figure P.

I. Copy the figure P, mark the location A for the image of the pointed object to the viewer.





II. How is called the incident angle b in the phenomena Q?

III. What is the value of refracted angle in the phenomena Q?

IV. In the phenomena P, Q and R, write the ascending order of the angles a, b and c ?

V. Write a usage of phenomena R for human beings?

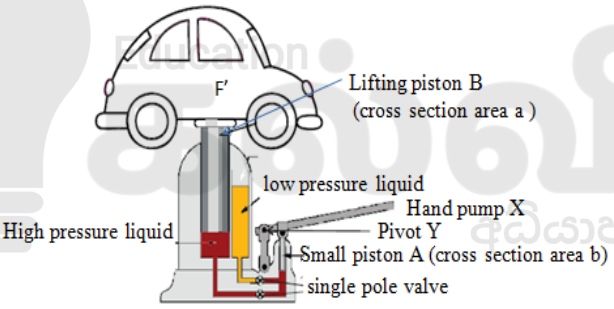
(20 marks)

08. (A).

Rhizome	Bulb	Stem tuber	Corm	Stem cutting	Runner
A	B	C	D	E	F

1. Which common name is used to call the above parts of plants?
2. Give the common name, that is only used to call the parts A, B,C and D ?
3. State an advantage for the reproduction of plants by the above parts?
4. What type of cell division takes place in the above type of reproduction?
5. Identify the reproductive methods A,B,C,D,E and F for the following plants ?
   - I. Potatoes
   - II. Vallarai
   - III. Croton
6. I. How is called the reproduction that is processed with the formation of gametes in plants?
   II. Which special part is formed in plants for the above type of reproduction?
   III. There are 28 chromosomes in the stem of the above plant. How many chromosomes are in the gamete of the above plant?
   IV. What is the male gamete of above plant?

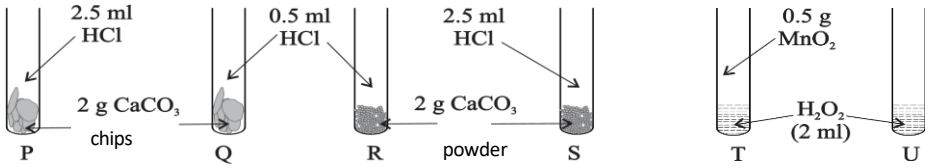
(B). A hydraulic jack operating by liquid pressure is shown in the figure.



1) Mention another use of liquid pressure in the lifted car ?
2) The force applying on the hand pump is transmitted through piston A. Write the equation for calculating the force F' by using the quantities F, F', a and b?
3) If F = 10N, a = 0.5m2, b = 0.01m2, find the force F' on the piston B?
4) How many times of force is gained on piston B like the force applied on the hand pump?
5) In which location x or y, the frictional force acts beneficially?
6) State a method to increase the frictional force on car tyres ?
7) State the following statements related with friction and pressure are "true" or "false"?
   1. By increasing the width of the car tyres, the friction may be increased. ( )
   2. For reducing the pressure exerted by the car on the floor, the width of the car tyres may be increased. ( )

(20 marks)

09. (A). The sets of apparatus arranged by the students to identify some factors that affect the rate of reaction are shown here.



1) What do you mean by **the rate of reaction** for a chemical reaction?
2) I. Which experimental setups show the factor, the nature of the surface that affect the rate of reaction?
   II . Explain that how the rate of reaction increases with increment of surface area?
3) I . Which experimental setups show the factor, the catalyst that affects the rate of reaction?
   II . What is the catalyst used here?
4) I . Write the balanced chemical equation for the chemical decomposition of hydrogen peroxide?
   II . What is the mass of dried solid residue that is deposited in the test tube finally in the above reaction?
   III . Which property of catalyst is confirmed from the above observation ?
5) Give the catalyst that is used for manufacturing nitric acid by oxidizing ammonia industrially?
6) Categorize the following reactions as slow reaction or fast reaction?
   I . rusting of iron
   II . burning firewood

(B). Copper wires are taken to investigate the factors that determining the resistance of a conductor. The figures are given below.

1. Which factors are determined by the above two sets of wires X and Y?
2. Which wires will be selected to make high resistance value from the sets X and Y?
3. Which wire has very low resistance in the set X?
4. The wire F has the resistance value 90 ohm.
   I . If, same three wires of F are connected in series, find the equivalent resistance?
   II . If the wire F is cut into same three pieces and connected parallel, find the equivalent resistance?
   III . Two electrical circuits are arranged by connecting wire F in one and the wire F is cut into same three pieces and connected parallel in another one, In which circuit the total current flow will be high?

(20 marks)

2025

1ம் தவணை வகுப்புகள்

தரம் 6 முதல் 11 வரையான மாணவர்களிற்கான தமிழ் மற்றும் ஆங்கில மொழிமூல வகுப்புக்கள் ஆரம்பமாகவுள்ளன.

ஆரம்பம் 01.01.2025

இலங்கையின் எப்பாகத்திலிருந்தும்
Zoom app மூலம் எமது வகுப்புகளில்
இணைந்து கொள்ள முடியும்.

அனைத்துப் பாடங்களும் ஒரே கல்வி நிறுவனத்தின் கீழ்...

Education கல்வி අධ්‍යාපන Kalvi.lk

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