

Unedited Copy. Please refer the relevant Sinhala/ Tamil paper in case of clarification.

G.C.E. O/L 2016 - New Syllabus Revision Exercises - Science (No. 03)
Science 1 – Duration 1 Hour.

Note :

(i) Answer all the questions.

(ii) Select the most suitable answer out of 1 to 4 for the questions given.

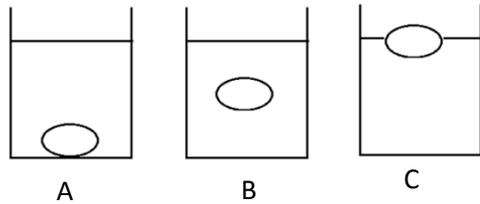
(iii) Put (x) in the correct space.

(iv) Follow the other instructions given in the paper.

- The organcell that cannot be observed with the optical microscope is
(1) nucleus (2) vacuote (3) ribosome (4) plasma membrane
- In which of the following an epithelial tissue is found?
(1) muscles (2) grey matter in the spinal cord
(3) wall of the heart (4) wall of the urinary bladder
- A neutral substance is
(1) quicklime (2) vine spirit
(3) baking soda (4) milk of magnesia
- In chromatographic technique, which of the following is used to place a drop of the extract on the filter paper?
(1) a glass rod (2) a pencil tip (3) a capillary tube (4) a tip of a pin
- of acceleration due to gravity is 10 ms^{-2} the option that gives the weight of an object of mass 25 kg correctly is
(1) 25 N (2) 2.5 N (3) 50 N (4) 250 N
- The value of a resistor is 21Ω . Which of the following gives in order the respective colour rings corresponding to this resistance ?
1) red ,brown ,brown 2) red ,brown ,black 3) red , red, brown 4) brown ,brown, red
- The chemical formula of a compound is X_2Y . Of the four elements Mg ,K ,O and Cl, which two elements the four elements Mg, K, O and Cl, which two elements match X and Y.

- 1) Mg, Cl, 2) Mg, O 3) K, O 4) K, Cl
8. Which of the following is a hereditary disease?
 1) tuberculosis 2) thalassaemia 3) leprosy 4) AIDS
9. The transformations of energy taking place when pulling a catapult and shooting a stone placed in it is correctly given in order by
 1) kinetic energy → elastic potential energy → kinetic energy
 2) kinetic energy → elastic potential energy → gravitational potential energy
 3) gravitational potential energy → kinetic energy → elastic potential energy
 4) elastic potential energy → kinetic energy → gravitational potential energy
10. The thoracic lymphatic duct opens into the
 1) right subclavian vein 2) left subclavian vein
 3) superior vena cava 4) inferior vena cava

- An egg was immersed in water followed by dissolving powdered salt in it little at a time. Three positions of the egg observed are given in the following diagram. Based on it, answer questions 11 and 12.



11. Which of the following statement is correct about the density of the solution in the instances A, B and C?
 1) $A < C < B$ 2) $B < C < A$ 3) $A < B < C$ 4) $C < A < B$
12. In this experiment, the egg moved up through the solution with the dissolving of sodium chloride because of
 1) the increase in the density of the solution.
 2) the decrease in the density of the egg.
 3) the decrease in the density of the egg and the increase in the density of the solution.
 4) the increase in the density of the solution than the density of the egg.
13. Which of the following is incorrect about the solubility?
 1) The solubility of a gas decreases when the temperature increases.

- 2) salt does not dissolve in kerosene but dissolves in water.
- 3) Styrofoam does not dissolve in water but dissolves in Petrol.
- 4) The mass of the powder of CuSO_4 is greater than the mass of specks of CuSO_4 which dissolves in 100 ml of water at the room temperature.

14. Which of the following is the correct statement about muscle cells

- 1) Skeletal muscle cells and cardiac muscle cells are striated.
- 2) Smooth muscle cells and cardiac muscle cells are striated.
- 3) Skeletal muscle cells and smooth muscle cells are striated.
- 4) Skeletal muscle cells, smooth muscle cells and cardiac muscle cells are striated.

15. Wattages of several electrical appliances are as follows.

- A Washing machine 250 W
- B Soldering gun 25 W
- C Colour television 600 W
- D Immersion heater 1500 W

Which of the above consumes the highest amount of electrical energy per minute?

- 1) A
- 2) B
- 3) C
- 4) D

16. The amount of the heat required to convert a kilogram of water at 1000°C to steam at 1000°C

- 1) the specific heat of evaporation of water.
- 2) the specific heat capacity of water.
- 3) latent heat of capacity of water.
- 4) latent specific heat of water.

17. Select the correct statement about carbon dioxide. (C = 12 , O = 16)

- 1) The mass of one mole of carbon dioxide is 28g.
- 2) The number of carbon atoms in a mole of carbon dioxide is half the number of oxygen atoms.
- 3) The amount of moles of oxygen atoms in one mole of carbon dioxide is one.
- 4) The number of carbon dioxide molecules contained in one mole of carbon dioxide is 3.011×10^{23} .

18. If 200 ml of a sodium hydroxide solution contains 0.1 mol of sodium hydroxide, the composition of the solution in gdm⁻³,

- 1) 2 g.
- 2) 4 g.
- 3) 20 g.
- 4) 40 g.

19. Which of the following is not a characteristic of a meristematic tissue?

- 1) presence of large nucleus
- 2) cell walls being thick

3) absence of chloroplast
mitochondria

4) presence of a large number of

20. Which of the following correctly describes the motion of a sportsman who had sprinted 400 m in a track of 200 m shown in the diagram.



- 1) His displacement is 200 m and the distance he travelled is 400 m.
 - 2) His displacement is 0 m and the distance he travelled is 200 m.
 - 3) His displacement is 400 m and the distance he travelled is 0 m.
 - 4) His displacement is 0 m and the distance he travelled is 400 m.
21. A clear image of a distant coconut tree could be obtained at a point 20 m away from the optical centre of a convex lens. A lighted candle was placed 30 cm away from the optical centre of this lens. Then, the image of the candle flame obtained would be
- 1) real, inverted and magnified.
 - 2) virtual, inverted and magnified.
 - 3) real, erect and magnified.
 - 4) virtual, erect and magnified.
22. Of the following which cells are found only in the problem tissue?
- 1) Vessel cells and sieve tubes.
 - 2) Trachieds and paranchymatous cells.
 - 3) Seiveve tubes and companion cells.
 - 4) Seive tubes and trachiends.
23. Given below are some characteristics of a plant tissue.
- A - composed of living cells.
B- composed of cells of equal diameter.
C- composed of cells with large vacuoles
- The tissue with the above characteristics is
- 1) parenchyma.
 - 2) phoem.
 - 3) collenchyma.
 - 4) xylem.
24. Which of the following is not an exothermic reaction?
- 1) $\text{HCl (aq)} + \text{NaOH (aq)} \longrightarrow \text{NaCl (aq)} + \text{H}_2\text{O (l)}$
 - 2) $\text{CaO (s)} + \text{H}_2\text{O (l)} \longrightarrow \text{CaOH(s)}$
 - 3) $\text{CaCO}_3 \longrightarrow \text{CaO (s)} + \text{CO}_2(\text{g})$
 - 4) $\text{Zn (s)} + \text{HCl (aq)} \longrightarrow \text{ZnCl}_2(\text{aq)} + \text{H}_2 (\text{g})$
25. Which of the following phenomena cannot be explained by means of the intermolecular forces existing among the water molecules?
- (1) boiling point of water being high.
 - (2) evaporation of water at any temperature.

- (3) specific heat capacity of water being high.
- (4) density of ice being less than that of water.



As regards, the process of digestion of food, the responses that match A and B are

- 1) Protein and peptidase 2) lipids and lipase
- 3) Carbohydrates and lactase 4) maltose and maltase

27. Consider the following statements about respiration.

- A- Drawing air with oxygen into the lungs is external respiration.
- B- The process of oxidizing simple foods in living cells to generate energy for biological processes is cellular respiration.
- C- Fermentation of alcohol is aerobic respiration.

Of the above, the correct statements are

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

28. Given below are several statements about waves.

- A) The waves propagating in the direction perpendicular to the direction in which the particles of the medium vibrate are called longitudinal waves
- B) Sound propagates in maximum velocity through solids.
- C) The waves which need a medium for propagation are mechanical waves
- D) Heat waves are a form of electromagnetic waves.

Of the above which is false statement?

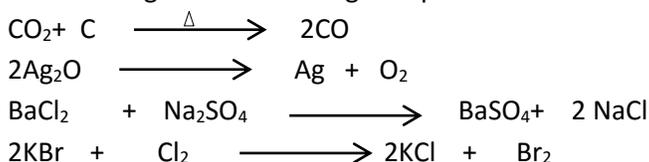
29. Some definitions related to genetics are given below.

- P – The factors that transmit hereditary characters from one generation to another are called genes.
- Q- The way in which a pair of genes responsible for a particular character is denoted is called the gene equation of that organism
- R – The gene that are located on the same chromosomes and can segregate independently are called linked genes.

Of the above the correct statements are,

- 1) Only P & Q 2) only Q & R 3) only P and R 4) all P, Q & R

30. Of the following which is the single displacement reaction?



31. Which of the following is not a property of a non metallic element?

- 1) Existing as molecules
- 2) Formation of giant molecules
- 3) Existence of free electrons among ions
- 4) Formation of acidic oxides

32) Write the incorrect statement about the importance of photosynthesis.

- 1) Photosynthesis is the process that provides energy necessary for the metabolic activities of living organisms
- 2) Carbon dioxide gas added to the environment by processes such as combustion and respiration is removed from it by photosynthesis.
- 3) Photosynthesis is the major process that liberates oxygen essential for the existence of living organisms and combustion.
- 4) Photosynthesis is a main process that contribute to maintain the carbon cycle.

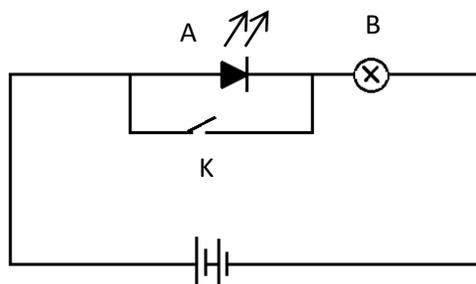
33.)When rowing a boat, a force is applied on water with the oar and the boat is made to move in the opposite direction. Some statements regarding the action and reaction coming into play here are given below.

- A) Action and reaction are equal in magnitude
- B) Action and reaction are opposite in direction
- C) Action and reaction act along the same line
- D) Reaction is twice as much as the action

Of the above, the true statements are ,

- 1) Only A,B and C 2) Only B,C and D 3) Only C,D and A 4) Only D,A and B

34) A circuit constructed using an LED, a 2.5V torch cell and a 3.0V battery is shown below.



Four statements made with respect to the above circuit are as follows,

- A) Only B lights when switch K is closed
- B) A light and B lights dimly when switch K is closed.
- C) A light brightly and B lights dimly when switch K is opened.
- D) A lights and B doesn't light when switch K is opened.

Of the above the true statements are,

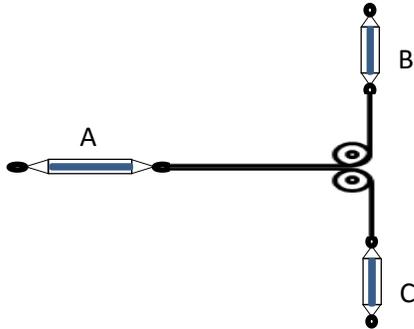
1) Only A and B

2) Only A and C

3) Only B and C

4) Only B and D

35) The diagram below shows a setup made using smooth pulleys and light strings. In which of the readings of the spring balances are given correctly?



	A	B	C
1	4N	3N	2N
1)	4N	2N	2N
2)	4N	1N	3N
3)	4N	4N	4N

36) The following table shows how four solutions of hydrochloric acid were prepared.

	A	B	C	D
Volume of the hydrochloric acid / cm^3	10	8	6	4
Volume of water / cm^3	0	2	4	6

Of four pieces of clean magnesium ribbons of equal masses were made to react with each of the above solutions, in which the gas bubbles evolve fastest ?

1) A

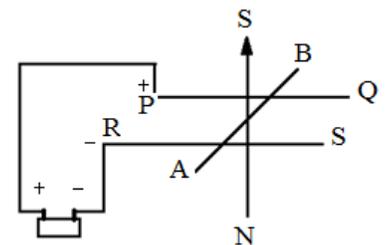
2) B

3) C

4) D

37. The diagram show two copper conductors (PQ and RS) kept parallel to each other. AB is another copper conductor kept on them perpendicular to them. The terminals of a 6V direct current supply are connected to the ends P and R. A magnetic field is applied in the direction from N to S. Which of the following statement is false about this set up.

- 1) When switch K is closed, the conductor rod AB rolls to left.
- 2) When switch K is closed, the conductor AB rolls to right.
- 3) When wire AB is made lighter, the rolling speed increases.
- 4) When the activity is done, the battery is used up faster.



38. In which of the following instances a different metal cannot be electroplated on an iron nail?

	Anode	cathode	electrolyte
A	Copper	Iron nail	Copper sulphate
B	Zinc	Iron nail	Zinc sulphate
C	Iron nail	Copper	Copper sulphate
D	Iron nail	Zinc	Zinc sulphate

1) A හා B ය

2) B හා C ය

3) C හා D ය

4) B හා D ය

39. Of the domestically used chemical products, which of the following has a strong effect on the pollution of soil water?

- 1) Disposed mobile phone batteries
- 2) Effluent water mixed with detergents
- 3) Volatile vapours released when using cosmetics
- 4) Electronic wastes

40. Pay attention to the following facts.

- A – painting inner walls of the house with dark colours
- B – obtaining electricity from solar panels
- C – maintaining a small bio gas unit
- D – using waste water for crops

Of the above the facts that should be focused on when constructing a house that utilizes natural energy sources maximally are,

- 1) A and B
- 2) B and C
- 3) A, B and C
- 4) B, C and D

Science- Paper II

Three Hours

- This paper consists of two parts: **Part A** and **Part B**
- **Part A** consists of structured essay questions. For that, answers should be written on this paper itself.
- **Part B** consists of 5 semi structured essay questions out of which **only three questions** should be answered.

Part A – Structured Essay

01.A. A vegetable cultivator made use of a labourer to apply chemical fertilizers to his chilly cultivation.

After the application of fertilizer, some chilly plants were observed to be wilted.

Answer the following questions referring to the above phenomenon.

i) What is the observation related to this phenomenon? (1 Mark)

.....

ii) What is the problem you identified accordingly? (1 Mark)

.....
.....

iii) Build up a hypothesis based on the problem. (1 Mark)

.....

iv) Write the steps of an activity you would design to test that hypothesis. (1 Mark)

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

v) Write how you would reach a conclusion accordingly. (1 Mark)

.....
.....

B. The letters A-F indicate effluent gases which change the optimal composition of the atmosphere.

A -SO ₂	B -NO ₂	C -CO ₂	
D -CFC	E -volatile hydro-carbon molecules	වාෂ්පශීලී හයිඩ්‍රොකාබන් අණු	F
-CH ₄			

i) Of these components,

a. Select and write the letters that refer to components emitted in fuel combustion of automobiles. (2 Marks)

.....

b. Select and write the letters that refer to the components which contribute in the Green House Effect. (2 Marks)

.....

ii) Name two letters referred to effluent gases which affect the following phenomena.

a. photo chemical smog(02 Marks)

b. occurrence of acid rains(02 Marks)

02. A student put some meat in a crucible and heated that thoroughly. Then he held a glass plate over the crucible. Next, he dried up the crucible properly and continued the same procedure with some dry rice and egg shells added into it. It was observed that liquid drops sediment on the glass plate. The reaction which took place when anhydrous CuSO₄ was added onto the liquid drops was observed.

A. i) What is the colour change he observed? (01 Mark)

.....

ii) According to that colour change, what are those liquid drops? (01 Mark)

.....

iii) State two specific features related to life of the inorganic component you identified in the above (ii). (02 Marks)

.....

B.i) The structural and functional unit of life is the cell. Write a difference between plant cells and animal cells. (01 Mark)

.....

.....

ii) Name a simple permanent tissue and a complex permanent tissue. (01 Mark)

.....

iii) Write one function each of a tissue you named. (01 Mark)

.....

C. Plants are categorized into the two groups of flowering plants and non-flowering plants. A few plants are stated below.

Mango, Cycas, Selaginella, Salvinia, coconut

i) Write a non-flowering seed plant and a non-flowering seedless plant each. (02 Marks)

.....

ii) State the two groups into which flowering plants can be divided. (02 Marks)

.....

.....

iii) Green plants produce food with the raw materials of water and carbon dioxide. Name the type of energy used in the process of food production. (01 Mark)

.....

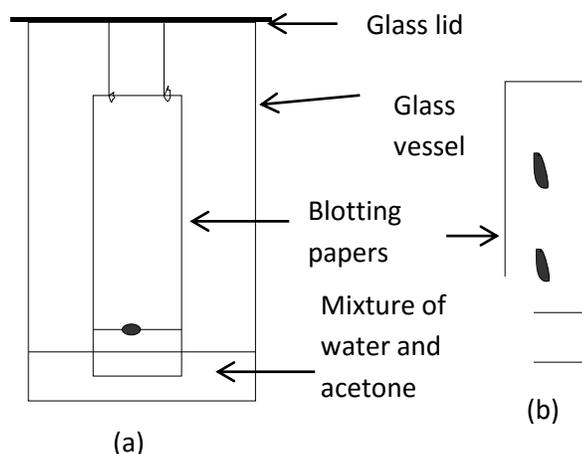
iv) State in three steps an experiment that can be done to prove that the above factor is essential in the process of food production. (03 Marks)

.....

.....

.....

03.A. Figure A indicates a set-up to distinguish active components of a chemical extract of spinach leaves and Figure B shows the nature of the blotting paper after 10 minutes.



i) What is the method used in the above? (01 Mark)

.....

ii) b According to the Figure, how many active chemical components were found in the spinach extract? (01 Mark)

.....

iii) Name another occasion this method is used to distinguish (01 Mark)

.....

B. The above solvent mixture was prepared by dissolving 116g of acetone (CH_3COCH_3) in 90g of water.

i) Calculate the amount of Acetone Moles. (01 Mark)

.....

ii) Calculate the number of water moles. (01 Mark)

.....

iii) Calculate the mole fraction of Acetone in the mixture. (01 Mark)

.....

iv) Calculate the number of Acetone molecules in the mixture. (01 Mark)

.....

C. i) Is it possible to use a carbonic compound instead of acetone in the above mixture? 01 Mark)

.....

ii) Explain the reason for your answer. (01 Mark)

.....

iii) Draw the structural formula of the compound. (01)

D. The polymer in the chromatographic paper is cellulose.

i) According to its structure, name the type of polymer that cellulose categorized into.

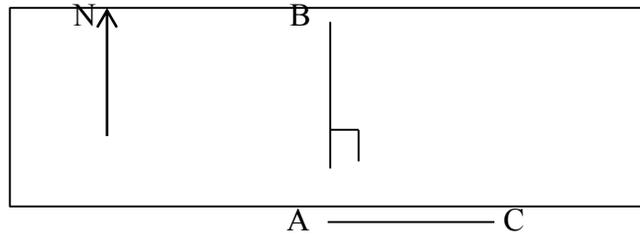
(01 Mark)

.....
ii) Write another industrial use of cellulose except paper production. (01 Mark)
.....

04.A. Following are the steps of an activity in which a group of students engaged in.

Marking North on a flat land. Drawing AB and AC simple lines perpendicularly **as in the Figure** alongside two lines perpendicular to each other.

Nimal walking 10m along the AB simple line in 2 seconds. Kamal walking 10m along AC simple line from A, in 10 seconds



i) What is the laboratory equipment used to mark North in the above activity? (1 Mark)

.....
ii) a) What is the distance Nimal walked? (01 Mark)
.....

b) What is the displacement of Nimal? (01 Mark)
.....

iii) Are the displacements of Nimal and Kamal equal? (2 Marks)

.....
Explain the reason for your answer.
.....

iv) Of Nimal and Kamal, who walked faster? (01 Mark)
.....

B. i) a) Describe the action and reaction working on Nimal's rear leg which is in touch with the ground, when he is walking along the AB line. (2 Marks)

.....
.....

b) Write the 3rd Law of Newton of which Nimal's motion is based on. (01 Mark)

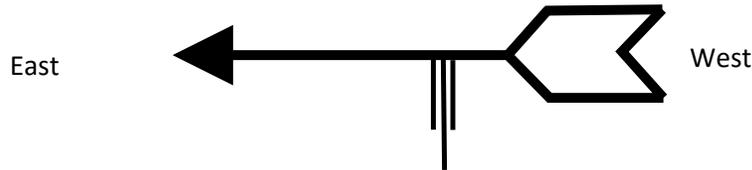
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ii) If Nimal's mass is 40kg, calculate the gravitational force applied on Nimal. $g = 10 \text{ ms}^{-2}$ (01 Mark)

.....
.....

iii) Explain briefly how frictional force becomes important for Nimal's motion. (02 Marks)

.....
.....



C. A wind vane had been fixed in the flat ground where the activity was done. At a certain moment it was in balance in the direction of East-West.

i) Write two principles related to force on which the function of wind vane is based. (2 Marks)

.....
.....

ii) What is the direction of wind at the moment? (01 Mark)

.....

Part B - Essays

Answer only three questions.

05.A. Given below are the steps of an experiment done by a group of grade 11.

- Preparation of a solution of starch with some wheat flour dissolved in warm water.
- After washing the mouth with pure water, taking some distilled water into the mouth and gargling it for about 5 minutes making a solution of saliva and putting the solution into the beaker. Putting the starch solution 2 ml each into two test tubes. Adding 5 ml of distilled water into one test tube (A) and 5 ml of the saliva solution into the other (B). After stirring them thoroughly, keeping both mixtures in a vessel of water of 37° C. (Figure 1)
Putting 5 drops each of the solutions (A) and (B) onto a white porcelain tile and adding 2 drops of iodine solution onto them..(Figure 2)

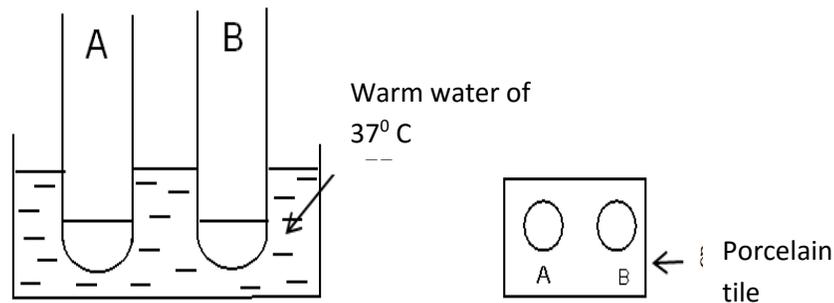


Figure 1

Figure 2

i) a) After the addition of iodine, state the colour change to be observed in the drop of iodine added to the solutions on the porcelain tile. (1 Mark)

b) Explain the reason behind the above colour change. (2 Marks)

ii) a) How does the lymphatic system become important in the absorption of the end products of digestion? (1 Mark)

b) Name a disease associated with the digestive system. (1 Mark)

B. In the cells, glucose which is an end product of food digestion is used for respiration. Cellular respiration is of two types ; aerobic respiration and anaerobic respiration.

i) Write two differences between aerobic respiration and anaerobic respiration. (2 Marks)

ii) What is the main excretory material of aerobic respiration? What is the organ which removes that out of the body? (2 Marks)

iii) Name another excretory organ other than the one you named above and write the main excretory material it removes. (2 Marks)

C. An example for metabolism is the control of blood sugar level.

i) What is known as metabolism? (2 Marks)

ii) Name the two hormones secreted by pancreas that help in regulating the blood sugar level. (2 Marks)

iii) Name a process that takes place in the body that keeps the body temperature constant when the room temperature is low. (1 Mark)

D. Menstruation is a process regulated by hormones.

i) Write a change each that occurs in the concentration of progesterone hormone in blood and the uterus during menstruation. (2 Marks)

ii) State simply fertilization and implantation. (2 Marks)

06.

A. A, B, C, D, E, F, G, H and I are nine consecutive elements of the periodic table. The symbols used are not standard.

- ... are the elements with maximum electro negativity.
- Use only these symbols and answer the following questions.

i) Write the electronic configuration of G.

ii) Write the symbols of the two elements which have valence 1.

iii) Write the molecular equation of the compound made with the combination of A with E.

iv)

a) Write the balanced equation of the reaction between E with diluted HCl.

b) Write two observations to prove that this reaction is a chemical reaction.

c) To which category does this reaction belong?

B. The steps of a laboratory activity is given below.

- Preparing an HCl acid solution with a concentration of 0.1 mol dm^{-3} .
- Preparing a NaOH solution with a concentration of 0.1 mol dm^{-3} .
- Putting 25 ml of prepared NaOH to a plask.

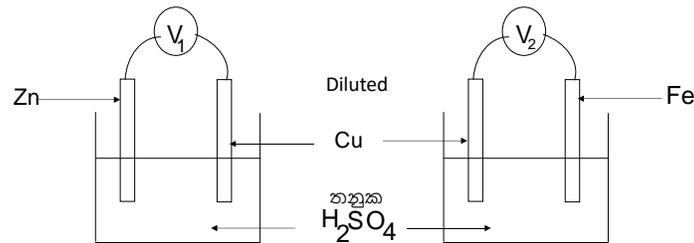
- Adding a small amount of phenolphthalein solution.
- Putting 50 ml of prepared HCl solution to a burette.
- Shaking the flask with NaOH solution while adding HCl solution by opening the tap of the burette.

- i) What is the colour of the NaOH solution?
- ii) The addition of HCl was stopped when the solution became colourless.
- a) Is the mixture in the plask acidic/basic/neutral?
- b) Given below is the incomplete equation of the reaction relevant to that. Name X and Y.



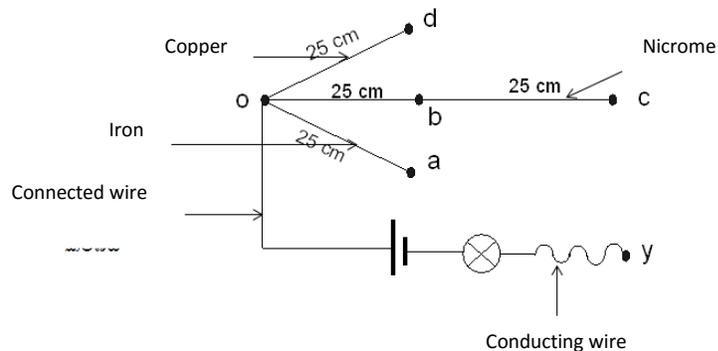
c) This reaction is exothermic. Write an observation to prove this.

C. Given below are two electro chemical cells prepared with equal volume of diluted H₂SO₄ solution. The physical nature of the metal sheets is equal. V₁ and V₂ are two volt meters.



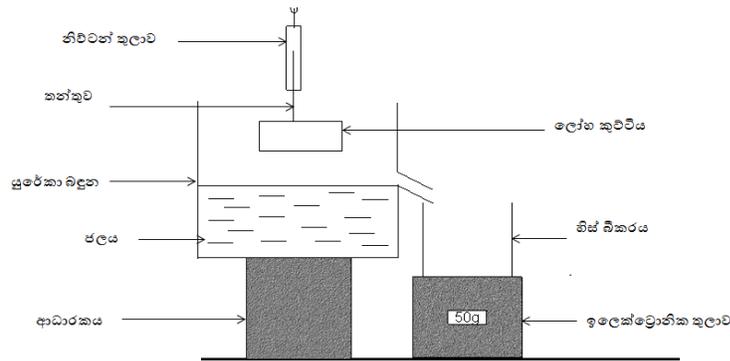
- i) What is the highest reading out of V₁ and V₂?
- ii) Explain your answer to (i) considering the location of the two metals in the electro chemical series?

07.A. Given below is a part of a circuit prepared using copper, nicrome and iron wires of equal diameter.



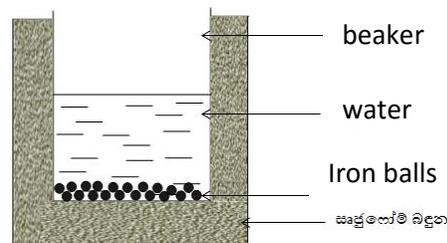
- i) a) The Y terminal was touched in a, b, c points. The contact of which spot gives the maximum illumination of the bulb?
- b) Give reasons for your observation.
- ii) a) Y end was touched with b and c. What is the difference in illumination of the bulb?
- b) What is your conclusion according to that?

B. The set of apparatus of a laboratory activity is given below. The reading of Newton balance is 40 N. The reading of the electronic balance is 50 g.



- i) What is the tension of the string connected to Newton balance and metal block?
- ii) The stone hanging from Newton balance was immersed completely in water. The reading of the Newton balance was 30 N.
- a) Write the reading of the electronic balance when adding of water to the beaker is completed.
- b) What is the law in physics which demonstrates this activity?

C. The above beaker with the collected water was put into a regifoam container. The initial temperature of water is 30°C . Some iron bullets were heated upto 90°C and put to the mixture at once and stirred. The final temperature of water was 40°C . The specific heat capacity of iron is $402 \text{ Jkg}^{-1}\text{C}^{-1}$ and the specific heat capacity is $4200 \text{ Jkg}^{-1}\text{C}^{-1}$.



Regifoam vessel

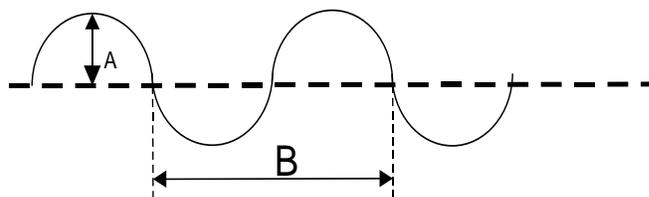
- i) Calculate the heat absorbed by water imagining that the glass container does not absorb heat.
- ii) Calculate the mass of the iron bullets used in this activity.

D.A bullet in the beaker was seen slightly lifted when observed above the water surface.

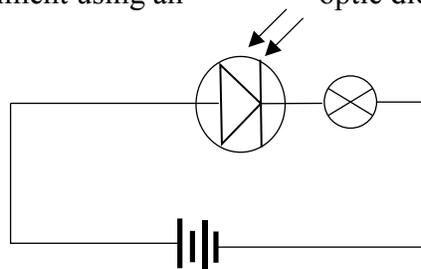
- i) a) What is the behaviour of light that cause for this phenomenon?
- b) Draw a ray diagram and mark the places where images occur to explain the lifted bullet.
- ii) One bullet was fallen when taking them out of the beaker. If the mass of a bullet is 1g and was falling from a height of 1 m, what is the potential energy of the bullet?

08.Supun was engaged in note training using his guitar.

- i) What is the method that notes are generated?
- ii) In which medium wave type does the notes produced by guitar travel in the air?
- iii) Given below is a diagram of the mechanical wave relevant to a note that transmits through the air. Find and write in order, the wave length and amplitude out of A and B.



B. Miyuru did the following experiment using an optic diode.



- i) Does the illumination of the bulb increase or decrease when the optic diode is covered with hand? Give reasons for your answer.
- ii) What is the type of the basic wave that transmits the energy from the lit bulb to Miyuru's eye?
- iii) What is the basic difference between the flowing current in the filament and the domestic circuit?

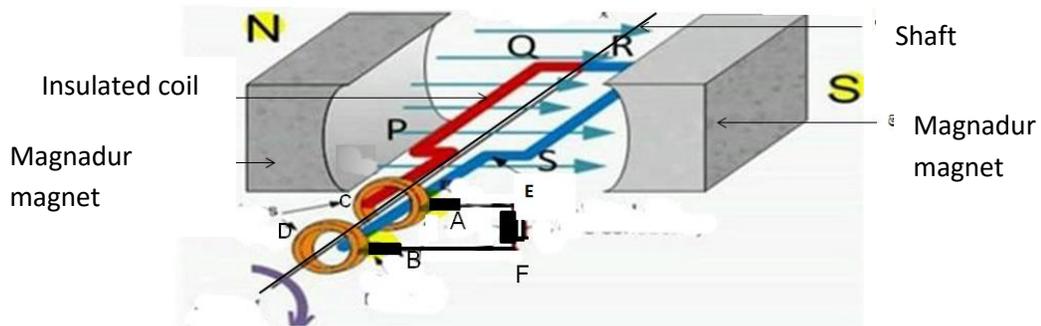
C. When playing the guitar, Supun's hand muscles, fingers, ear etc. are involved.

- i) What is the tissue that helps in this coordination given above?
- ii) Here, the rate of the cellular respiration of the muscle cells increases.
- a) Write a balanced equation to show the cellular respiration.
- b) Name the process in which gaseous components enter the body.

D. The stand rolled and the guitar fell down when Supun tried to hang it. He got excited.

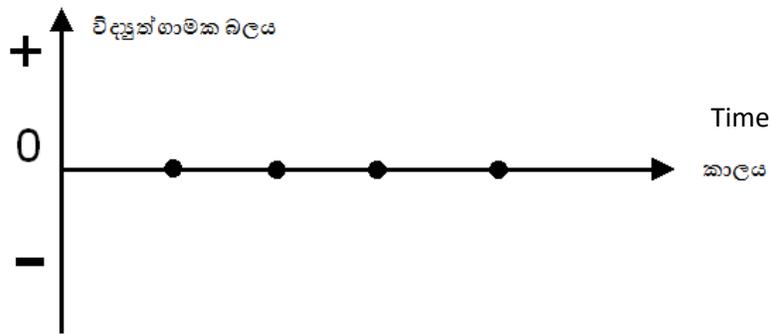
- i) What is the hormone that secreted to blood?
- ii) What is the endocrine gland that secretes it?

09. Given below is a model of an alternating current dynamo.

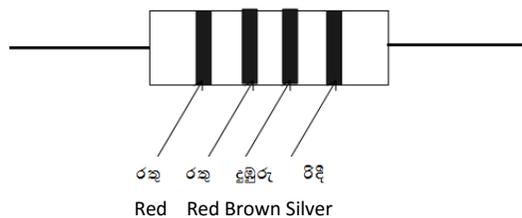


- i) Name the parts A,B and C,D.
- ii) a) At an instance of the PQ part of the coil is moving upwards, is it in EF direction or FE direction the current flows across the mass L?
- b) What is the Law that you used to identify the direction of the flow of current?
- c) Draw in the following graph the way how the current that flows across the mass fluctuates when the Shaft is rotated clockwise.

Electro generative power

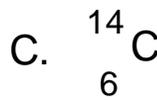
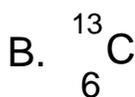
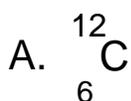


B. Permanent resistors, variable resistors and preset resistors are used in electric circuits. The outward appearance of the permanent resistor is shown in the following diagram.



- i) a) Draw the circuit symbol of a permanent resistor.
- b) Write the rough value of the resistor shown in the diagram. (Red = 2, Brown = 1)
- ii) What happens when a resistor is connected in series to an electric circuit?
- iii) When two resistors of 200Ω and 400Ω connected parallel, is the total resistant less than 200Ω or more than 200Ω ?

C. a) Carbon element is used in permanent resistors. The isotopes of carbon are given below.



- i) What is the commonly found isotope out of A, B, C?
- ii) Draw the atomic structure of B isotope. (All sub-atomic particles should be shown.)
- iii) a) Write a balanced chemical reactor to show the reaction between oxygen(gas) with carbon(element).
- b) Calculate the mass of the product using a balanced chemical equation when 24 g carbon is involved in the reaction.
- c) What is the type of chemical reaction this reaction belongs to?