G.C.E. (Ord. Level) Support Seminar (Science) – 2024 (2025)

Science I | **One hour**

Instructions

- Answer all questions
- In each of the questions 1 to 40, pick one of the alternatives (1), (2), (3), (4) which you consider is correct or most appropriate**.**

1. Select the correct scientific name of national bird of Sri Lanka.
   1).Gallus lafayetti 2). *Gallus lafayetti* 3). *Gallus Lafayetti* 4). *gallus lafayetti*

2. An object moving at a velocity of 40 m s^{-1} contains 80,000 J of energy. What is the mass of it?
   1). 10 kg 2). 100 kg 3). 1000 kg 4). 10 000 kg

3. Which element produces a white solid when burnt in air?
   1). Carbon 2). Magnesium 3). Sulphur 4). Hydrogen

4. Which of the following oxide is most acidic?
   1). Sulphur dioxide 2). Carbon dioxide 3). Carbon monoxide 4). Sodium oxide

5. Which pair of substances can be used to produce hydrogen gas in the laboratory?
   1) Ag and HCl 2) Au and HCl 3) Cu and HCl 4) Zn and HCl

6. When examining the factors needed for photosynthesis, which one's necessity is most difficult to be shown practically?
   1). Carbon dioxide 2). Sunlight 3). Water 4). Chlorophyll

7. What is the sex linked disorder that occurs **only** in males?
   1). Haemophilia 2). Albinism 3). Colour blindness 4). Thalassemia

8. The number of sex chromosomes in somatic cells of man is
   1). 1 2). 2 3).23 4). 46

9. What is the pressure exerted on the body of a fish swimming in a tank at a depth of 2.5 m?
   (Density of water = 1000 kg m^{-3}, Gravitational acceleration = 10 m s^{-2})
   1). 2500 Pa 2).15000 Pa 3). 25000 Pa 4). 250000 Pa.

10. When an object is thrown vertically upwards it travels a height of 20 m under the acceleration due to gravity. The velocity of the object, V should be (Assume that no energy wastage took during the transmission)
    1). 2 m s^{-1} 2). 4 m s^{-1} 3). 20 m s^{-1} 4). 40 m s^{-1}

11. An occasion which meiosis takes place.
    1). When producing gametes 2). When tail is grown to replace the broken tail of gecko
    3). Regrowth of tissue to heal a wound 4). A zygote is developed to a living organism

12. Which of the following is used as a catalyst in the production of ammonia industrially?
    1). Nickel 2). Manganese dioxide 3). Platinum 4). Porous iron

13. The number of neutrons and the number of electrons in the ion indicated by the symbol $^{31}_{15}Z^{3-}$ respectively are
    1). 15,16 2). 15,18 3). 16,18 4). 16, 31

14. Plants that are referred to as monoecious are
    1). Those that bear staminate flowers and pistilate flowers 2). Those that bear pistillate flowers
    3). Those that bear satmiante flowers 4). Those that bear unisexual flowers

15. Which of the following is **not** a characteristic of human hormones?
    1). A very small amount is sufficient 2). Transported by blood
    3). Site of production and the site of action is the same 4). Stimulating only the target organs

16. Which of the following is **not** a characteristic of the image produced by convex mirrors?
    1). Reduced in size 2). Laterally inverted 3). Real image 4). Upright image

17. Select the plants with natural parthenogenesis.
    1). Bread fruit , Grapes 2). Guvava , Apple
    3). Pineapple , Banana 4). Promaganate, Pineapple

18. Which of the following response represent the correct sequence, in the decreasing order of wavelength of the electromagnetic waves?
    1). Ultra violet, visible light , X rays , Infra Red
    2). X rays, Ultra violet, visible light , Infra red
    3). Infra red, Visible light, Ultra violet, X rays
    4). Visible light , infra red , Ultra violet , X rays

19. The locations of smooth muscle are,
    a) Face b) Wall of heart c) Wall of uterus d) Wall of blood vessels
    1) a and b 2) b and c
    3) c and d 4) b and d

20. Out of the following reactions, which is an endothermic process?
    1). Reaction of NaOH with HCl 2). Dissolving of NaOH with water
    3). Dissolving of solid NH_4Cl in water 4). Dissolving of H_2SO_4 in water

21. The human systems and diseases associated with them are given below.

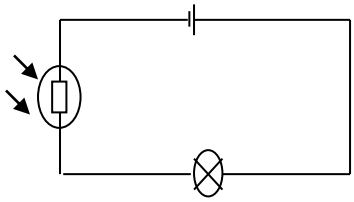
A) Urinary systems	a) Thrombosis
B) Respiratory system	b) Typhoid
C) Blood circulatory system	c) Silicosis
D) Digestive system	d) Nephrites

    Select the correct order of the diseases according to the given systems.
    1).b, c, a, d 2).a, b, c, d
    3).d, c, a, b 4).d, b, c, a

22. Equal concentration solutions of the following compounds given to you, which one has the highest pH?
    1). NaOH 2). H_2SO_4 3). NaCl 4). $NaHCO_3$

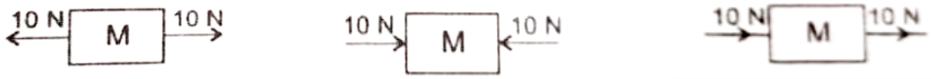
23. The SI unit of specific heat capacity is
    1). $J\ K^{-1}$ 2). $J\ kg^{-1}\ {}^0C^{-1}$ 3). $J\ kg\ {}^0C^{-1}$ 4). $J\ kg^{-1}\ K^{-1}$

24. The diagram shows light dependant resistor in a circuit .this can be used for



1). To switch on lamp when day light begins
2). Switch on the lamp when it begins to get dark
3). To make the battery charge in sunlight
4). To make the lamp flash on and off

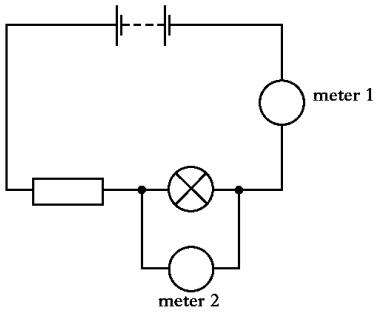
25. In which instance/s object is/are at equilibrium?



(A) (B) (C)

1). A and B 2). B and C 3). A and C 4). A, B and C

26. A circuit is shown below



Which of the following represent the measurement displayed by meter 1 and meter 2 respectively?

1). voltage across the lamp and current in the lamp
2). voltage across the resistor and voltage across lamp
3). Current in resistor and voltage across lamp
4). Current in lamp and voltage across battery

27. Some properties of compounds are given below.
A- Aqueous solutions conduct electricity. B – Most of the compounds are soluble in water.
C – Mostly exist as molecules made of several atoms.

Out of A, B and C , Properties seen in ionic compounds are
1). A and B only 2). A and C only 3). B and C only 4). A,B,and C

28. The diameter of the trunk of a jak tree increases with its growth. The activity of which one of the following tissues is responsible for this?
1). Xylem 2). Phloem 3). Cambium 4). Parenchyma

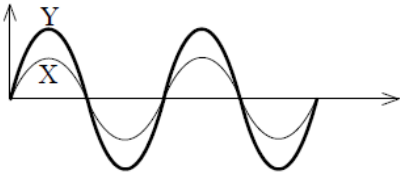
29. A transformer with 1000 turns in the primary coil and 100 turns in the secondary coil is used in the power transmission. If the primary voltage is 2300 V of AC is supplied, what would be type of transformer and the output voltage from the secondary?

1). 23 volts DC supply and step down transformer
2). 23 volts AC supply and step up transformer
3). 23000 volts AC supply and step down transformer
4). 230 volts AC supply and step down transformer

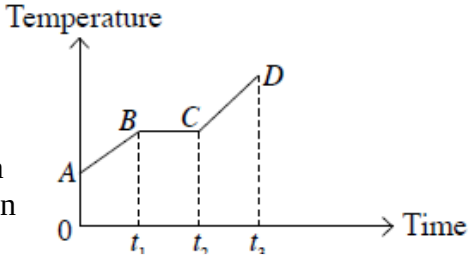
30. The addition of which of the following metals to zinc chloride could cause the formation of a precipitate?
1). Copper (Cu) 2). Iron (Fe) 3). Lead (Pb) 4). Magnesium (Mg)

31. Which of the following is **incorrect** about liquid pressure?
    1). Liquid pressure depends of the depth of the liquid
    2). Liquid pressure depends on the density of the liquid
    3). Liquid pressure depends on the shape of the container
    4). Liquid pressure depends on the gravitational acceleration

32. The graph shows two waves X and Y correspond to a source of sound. In these two waves
    1). Frequencies are equal 2). Amplitudes are equal
    3). Loudness is equal 4). Energies are equal



● The graph shows the variation of temperature when heating of solid wax. Question number 33 and 34 based on the graph given below.



33. Even when continuously heated, no change in the temperature observed between B and C .What is called heat supplied during this time interval?
    1). Latent heat of vaporization 2). Latent heat of Evaporation
    3). Latent heat of melting 4). Latent heat of condensation

34. Physical state/s of wax between B and C,
    1). Only liquid 2). Both liquid and solid
    3). Only gas 4). Both liquid and gas

35. Why high voltages and low currents used to transmit energy over long distance?
    1). To increase electromagnetic radiation 2). To reduce the resistance of the power lines
    3). To reduce heat loss from power lines 4). To increase the speed at which electrons move

36. The decomposition reaction of $CaCO_3$ is given below.(Ca=40,O=16,C=12)
    $CaCO_{3(s)} \longrightarrow CaO_{(s)} + CO_{2(g)}$
    The mass of CaO produced by decomposing of 200g of $CaCO_3$ is ,
    1). 28 g 2). 56 g 3). 88 g 4). 112 g

37. Four chemical reactions are given below.
    (A) Thermal decomposition of potassium permanganate. (B) Decomposition of hydrogen peroxide.
    (C) Thermal decomposition of calcium carbonate. (D) Electrolysis of water
    In which of the above instances is oxygen liberated as a product?
    1) A, B and C 2) A, B and D 3) A,C and D 4) B,C and D

38. The correct group which contain greenhouse gases
    1). CO_2, Ar, CFC , CH_4 2). CO_2 ,O_2, CFC ,CH_4
    3). CO_2, CH_4,, CFC , H_2 4). CO_2 , CH_4 , CFC , $H_2O_{(g)}$

39. Which answer includes ions / molecules which cannot be present in an aqueous solution of HCl?
    1). H^+ and OH^- 2). H^+ and Cl^- 3). H_2O and OH^- 4). HCl and H^+

40. Which of the following process causes the ill effects such as melting of polar ice caps, thermal expansion of sea water and change of climatic patterns?
    1). Acid rain 2). Ozone layer depletion 3). Greenhouse effect 4). Global warming

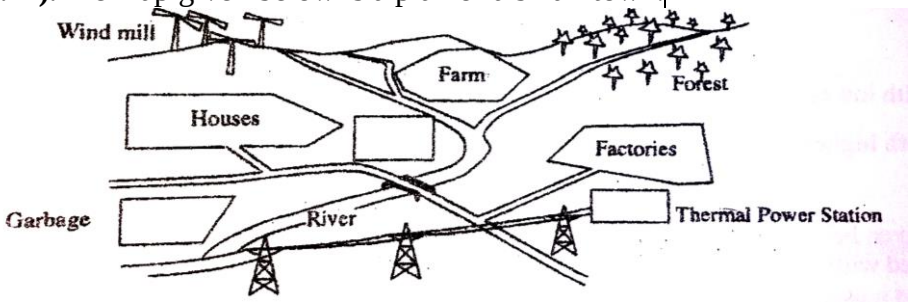
Part II

Time: 3hrs

- **Answer all four questions in *part A*, in the space provided.** **(Additional Reading time – 10 minutes)**
- **Of the questions in part B answer 3 questions only.**

Part A

01. A). **01. A).**The map given below is a plan of a small town.



i). What is the major environmental issue that can arise due to emitting polluted gases like sulphur dioxide and nitrogen dioxide from the factories near the city?

.....

ii).a). Water containing high amount of heavy metals are released to the river from the factories.name the organism from the list given below that live associated with the river which has the highest threat of deposit heavy metals in their body and which are lowest threat. (Plant planktons, Thilapia , Duck, Man)

Organism with lowest threat**:** ……. Organism with highest threat: ……..

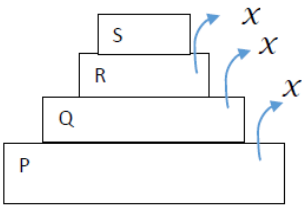
b). What is scientific term used for the above process?: …….

iii). The farm shown in the map is maintained in an environmental friendly manner. Complete the table given below by marking (√) in front of the correct sustainable agricultural uses and (×) for incorrect ones.

Agricultural use	Response
a. mono cropping	
b. biological pest control	
c. Use of traditional knowledge	
d. Use of inorganic fertilizers	

iv). The diagram below represents the organizational levels of the biosphere that can be seen in the forest. Put the organizational levels appropriately in the blank squares given.

B). Given below is the food pyramid for energy transformation in the forest. P,Q,R,S represents the tropic levels.



i). Energy entering the lowest tropic level at the pyramid is 2000kJ. How much energy is received by the last level?…….

ii). What is represented by X? ……..

C). Water body in an urban area looks green and gives out a bad smell.

i) What is this condition known as?

.....

ii) Write a harmful effect of the condition mentioned in (i) above.

.....

iii). Write the chemical symbols of the polyatomic ions responsible for this condition

……

D). Low food mile helps to achieve sustainability and it helps the development of the country.

i). What is known as food mile?

……

ii).Write a method how you can contribute to reduce food mile.

……

02. A). Diagram shows a set up arranged by a group of students to show the necessity of one factor needed for respiration

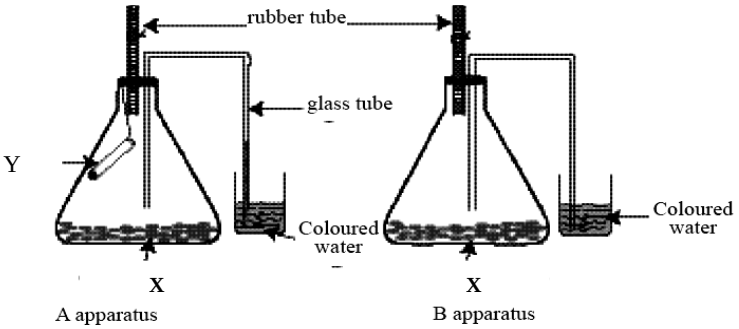
i).What is included as 'X' in the apparatus?

……

ii). What is included as Y in the boiling tube of apparatus A?.....

……

iii). Give reasons for using the above chemical substance……



iv). What is the expected observation of the above experiment?

……

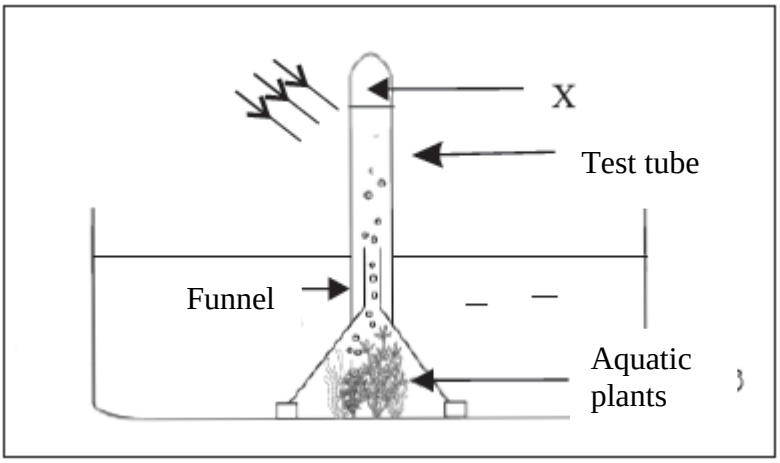
v). What is the conclusion arrived based on the above observation ?

……

vi). Some seeds do not germinate even though the necessary factors are available for the germination. Give two reasons for this condition of seeds and by which name it is known as?

……

B).The following is an experimental set up to examine a product of photosynthesis process.



i). What is the gas accumulates at the top of the test tube during the process?……

ii). What is the need of using glass funnel for this?.....

……

iii).What is the limiting factor for photosynthesis in these aquatic plants?

……

iv). What is the strategy used in this set up to speed up the release of air bubbles?

……

v). What is the type of carbohydrate formed first in the photosynthesis process?

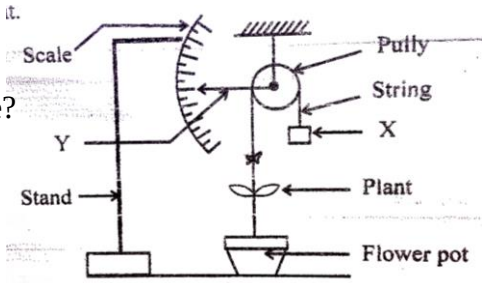
……..

vi). To which kingdom does hydrilla plants belongs in plant classification?

……

C). The diagram given below is a set up to observe certain biological activity of plant.

i). Name X and Y of the instrument



……..

ii). What is the biological activity of the plant observed here?

……

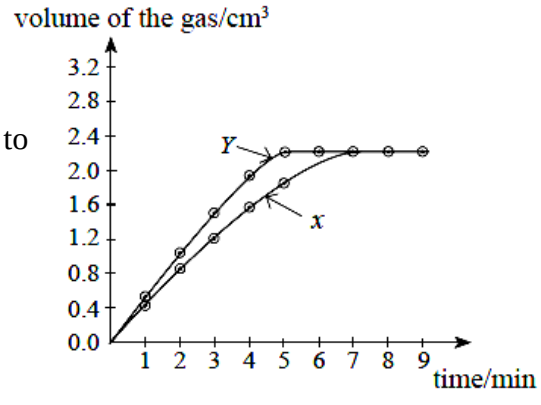
iii).What is the advantage of using the above set up?

……

……

03. A). Equal amount of strip and pieces of magnesium were separately made to react with 100.00$cm^3$of 0.2$moldm^{-3}$ HCl .The volume of gas produced by two reactions was measured and represented on a graph shown. X and Y are the two graphs obtained.

i). Out of X and Y, what is the graph related to pieces?



……..

ii).Calculate the time taken to stop the reaction in relation to magnesium pieces and strips……

iii). What is the maximum volume of the gas collected?

……..

iv).Write the balanced chemical equation for the reaction between magnesium and hydrochloric acid.

……

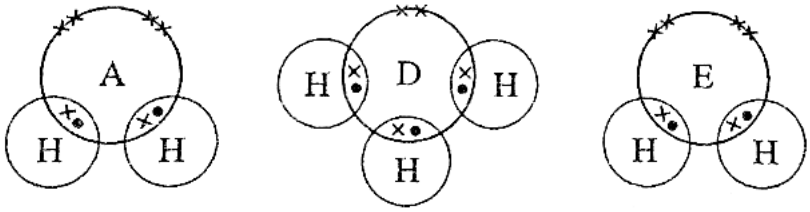
v).How many molecules of hydrogen gas is formed during the experiment in the above experiment?

…….....

vi).Name a chemical industry which uses hydrogen gas.

…….....

B). The dot and cross structures of the compounds formed by the elements A,D and E with (H) are given below. Atomic number of E is greater than A (In every element only outer electrons in the outer most shells are shown and atomic number of the elements A ,D and E is less than 20)



i). What is the valency of the element A ? ……..

ii). Of the above elements, which elements belong to the same group of the periodic table?
……..

iii). Element D exists as a diatomic gas in nature. Draw the Lewis structure of the molecule.
…….

iv). Hydride of D reacts with water to form a weak base. Write down the chemical formulae of this weak base. …….

C). The following questions are related to the elements of the **second row** in the periodic table. Write the **symbol** of the element in the space provided.

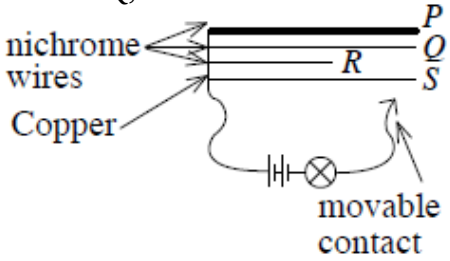
i). Identify the element that has the highest first ionization energy - ……..

ii). Identify the elements that has the highest electronegativity - ……

iii). The element that exist as monoatomic gas - ……

iv). The element that has allotrope which conduct electricity - …….

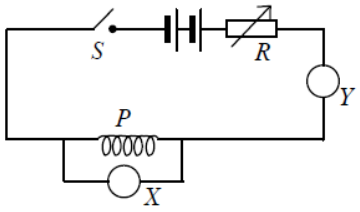
04. A). The set up arranged to study the factors affecting resistance using wires P,Q,R and S is given in the diagram. Wires Q,R and S have the same cross sectional area.



The movable contact is kept separately at the end of each P,Q,R and S. Relative brightness and accordingly the factors affecting the resistance are noted down incompletely in a table.

Pair of wires used	Bulb glows brighter with the wire	Factors affecting the resistance
P and Q	P	……
…….. and ……	……..	Length of the wire
Q and S	……..	……

B). The figure illustrate a circuit constructed by a group of students to verify a law related to electricity is a piece of wire with known resistance.



i). Name the equipment R. ……

ii). What is expected by connecting R to this circuit?

…….

iii). What are the quantities represented by X and Y?

……..

iv). Of the equipments X and Y ,select and write the equipment that is connected in parallel and in series.

……..

v). From this what law has the group of students attempted to verify.

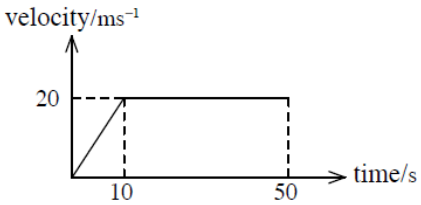
……

vi). Using the table find the resistance of the wire P.

……

X	Y
1.2	0.3
1.6	0.4
2.4	0.6
3.6	0.9

C). The following graph represent the motion of an object of mass 10kg started from rest.



i). According to the graph, find the acceleration of the object.

……..

ii). What unbalanced force should be applied to the object to acquire the above acceleration ?

……..

iii).What is the distance travelled with unbalanced force ?

……

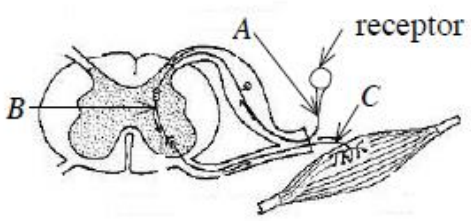
iv). If a force of 12N act on the object from 10s t0 50s, what is the frictional force acted on the object during that period ?

……

●**Answer any *three* questions in *part B***

Part B –Essays

5. A). Diagram shows some parts related to the nervous system



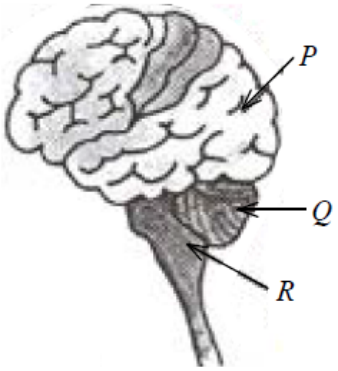
i). What is the functional unit of the nervous system?

ii). Name the neurones denoted by A,B and C.

iii). Write down two differences between nervous coordination and chemical coordination.

iv). State a reflex action related to the spinal cord.

B). The diagram represents the lateral view of the human brain.



i). Of the parts P, Q and R , which controls the process such as heart beat and respiration?

ii). State an advantage of the folded nature of its surface.

iii). Name two structures that protect the brain.

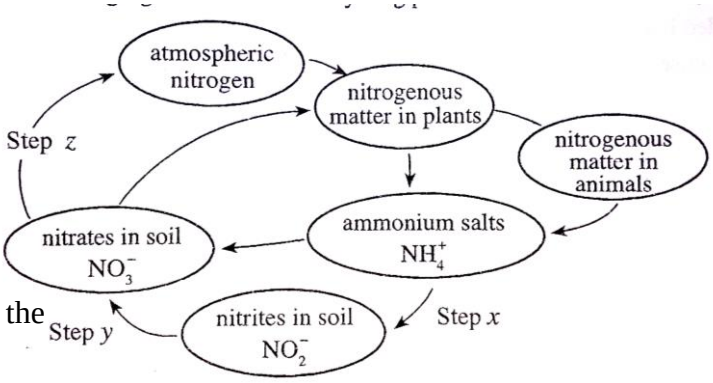
C). Red – green colour blindness is a human inherited disorder. This is caused by a sex linked recessive gene. A women who suffers from this disease is married to a normal male. If the recessive gene is represented by c and the dominant gene by C.

i). Write the genotype of the above male and the female.

ii). Write the genotype and the phenotype of the children born to them.

iii). Mention a symptom of this disease.

D). The following figure illustrates the cycling process of the element nitrogen.

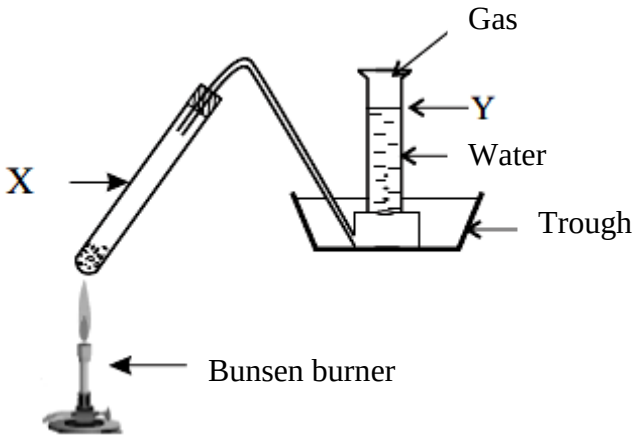


i). Of the steps x, y and Z above , which step associates denitrification.

ii). What species of living organisms carries out denitrification.

iii). Sate one synthetic fertilizer used to add the element nitrogen to the soil.

6.A). Following figure shows a set up prepared to collect a sample of oxygen gas.



i) Name the glass equipments X and Y.

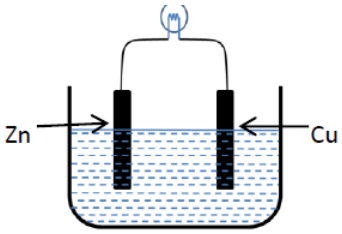
ii) What is the purple coloured chemical compound used here?

iii) To which type does the oxygen producing reaction here belong?

iv) What is the method of collecting oxygen gas, in the gas jar?

v). Write two uses of oxygen gas.

B). A diagram of an electrochemical cell (simple cell) is shown below.



i). What is the electrolyte used in the above cell?

ii). What is the direction of the flow of electron current in the cell?

iii). Write down the half reactions taking place at the anode and the cathode.

iv). Write down the energy transformation of the above cell.

v). What is the type of reaction according to the heat change?

C). Organic compounds are widely used to make polymers, cosmetics and pharmaceutical products. Organic compounds in crude oil are used as petroleum fuels.

i). What is the common formulae for alkanes?

ii). What is the method of extracting petroleum products from crude oil?

iii). Draw the structural formulae of 2 derivatives of ethene.

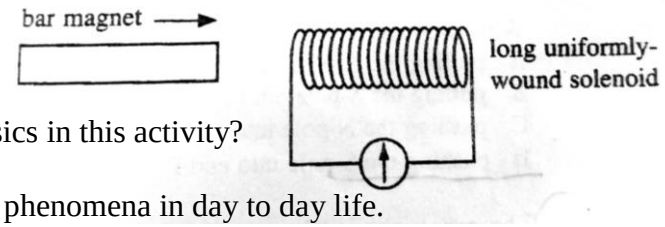
iv). What are the two major alkanes present in L.P.G?

v).Write down the balanced chemical equation for the complete combustion of 1 mole of propane.

vi). Calculate amount of CO_2 gas released to the atmosphere when 88g of propane completely reacted with O_2.

7. A). Given below is a set up arranged by group of students to demonstrate generation of electricity.

i). Write down an observation when moving bar magnet towards the coil.



ii). What is the phemonenon related to the physics in this activity?

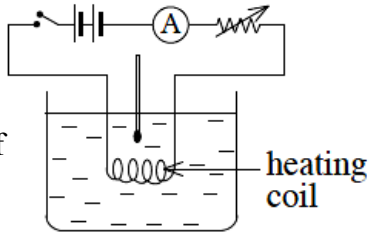
iii). Write down an instance of using the above phenomena in day to day life.

iv). Propose a change that you suggest in the set up to increase the magnitude of current through galvanometer.

v). What is the law that can be used to find the direction of force exerted on the needle of galvanometer ?

B). The following set up arranged to boil a sample water using heating coil.

i). What is the most suitable substance to make heating coil? Give reasons.

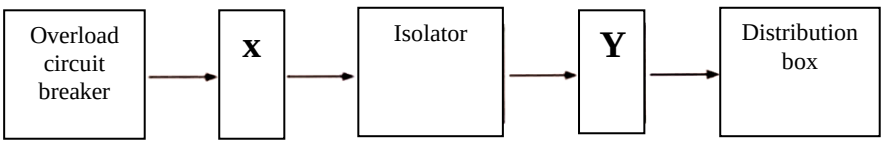


ii). If the ammeter reading is 2A,the resistance of the heating coil is 25Ω and the current flowed for 20 S ,what is the quantity of heat produced by the coil.

iii). Briefly explain, the reason why water in the vessel is heated quicker when the coil is immersed to a greater depth.

iv). If 250 g of this substance was heated from 20 ^{0}C to 80 ^{0}C, calculate, the amount of heat being absorbed. (Specific heat capacity of substance = 2800 J kg^{-1} ^{0}C^{-1})

C). Following figure shows the sequence of the parts of domestic electric circuit.



(i) Name x and y.

(ii) What is the function of x?

(iii) What is the unit used to measure the amount of electricity utilized in a home?

(iv) What is the important function carried out by instrument 'Y'?

(v) What are the equipment belong to the consumer unit?

8. A). In order to make the study easier, plants and animals are classified in to groups based on various features.

i).Name the groups of the animals with the following features

a). living only in marine habitats.

b).have a chitinous cover and bears jointed appendages.

c). presence of a muscular foot.

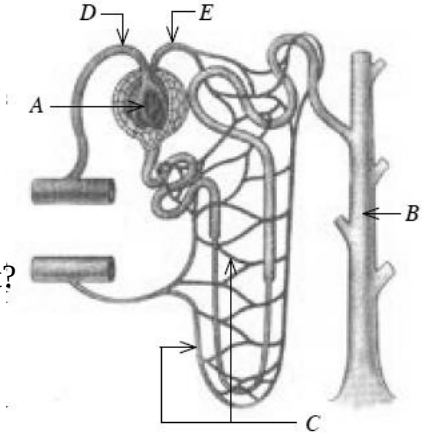
d). multicellular body build-up of two germinal layers.

ii). State a difference seen in monocotyledons and dicotyledonous plant leaves.

iii). Write down a similarity and a difference seen between angiosperm and gymnosperms plant.

iv).state a characteristic common to both birds and mammals.

B). The removal of unwanted products produced during metabolic activities from the body is called excretion. Nephron is the function unit of kidney. The diagram shows the structure of human nephron.



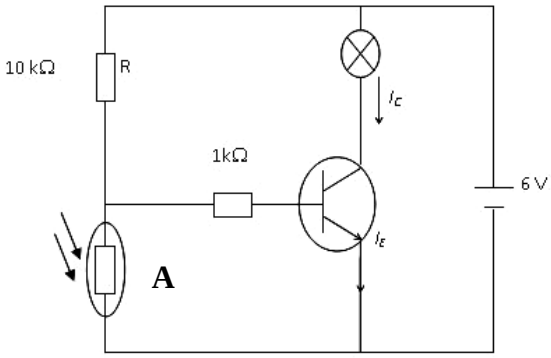
i). Name the process take place at A

ii). Name three nitrogenous excretory products found in urine.

iii). Write down the main structural difference between D and E.

iv).Why human faeces are not considered as an excretory product?

C). The circuit below used to light the bulb in dark.

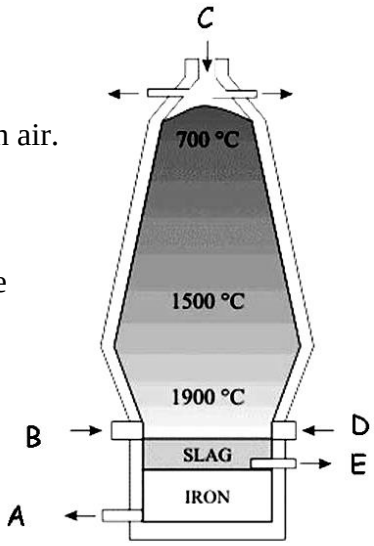


i). What is the type of transistor used in this circuit?

ii). Name the component A and briefly explain how it he to light up the bulb in dark.

iii). Transistor act as a switch in this circuit .write down function performed by transistor in electronic device

9). A).Iron ore is used as the main raw material in the extraction of iron. Iron ore contains impurities and to remove them, first, the ore is roasted. Then it is fed in to blast furnace. The diagram shows a longitudinal section of such a blast furnace

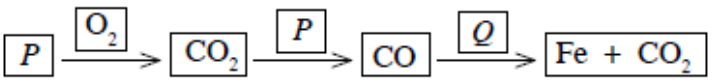


i). a). Name an element present in the iron ore as an impurity.

b). State an environmental problem caused by the roasting of iron ore in air.

c). Name the raw materials indicated as C in the diagram.

ii). Given below is schematic representation of the process that takes place in the blast furnace

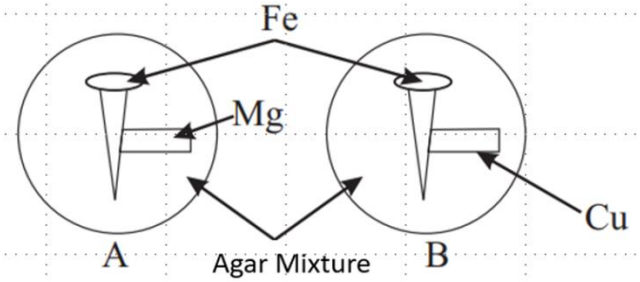


a). Name p and q above

b). Write the balanced chemical equation for the reaction between Q and CO.

iii). Write down the chemical formulae of slag and write down the advantage of floating it on iron.

B) Two setups made to test the effect of other metals on corrosion of iron are given below.

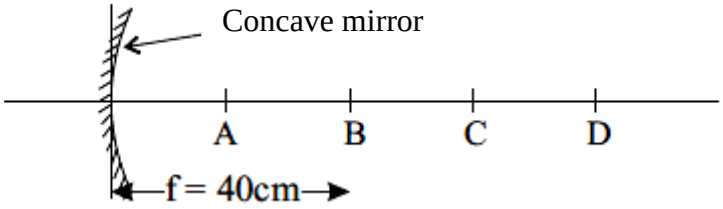


i) Name two substances added to the agar mixture.

ii) Write the colours separately near the iron nails in A and B setups.

iii) Mention an instances where cathodic protection is used to protect iron from rusting.

C). Concave mirror with the focal length of 4 cm, is used to observe the images in different places of A, B, C and D.



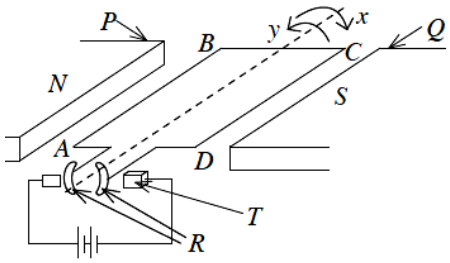
i) In which instance, image was observed, behind the mirror?

ii) Write two properties of this image.

iii). In which position of the object, an image cannot b e observed?

iv). Draw the ray diagram to show the image formed, when object was kept 1cm away from D.

D). The Diagram shows a model of DC (Direct current) motor .



i). Name the parts R and T.

ii). What is the material that can be used to make T .Give reasons for your answer.

iii).Write down the energy transformation of the motor.