



PROVINCIAL DEPARTMENT OF EDUCATION NORTHERN PROVINCE



Provincial Level Year End General Exam - 2013

Science - II

Grade - 11

Time : 3 hours

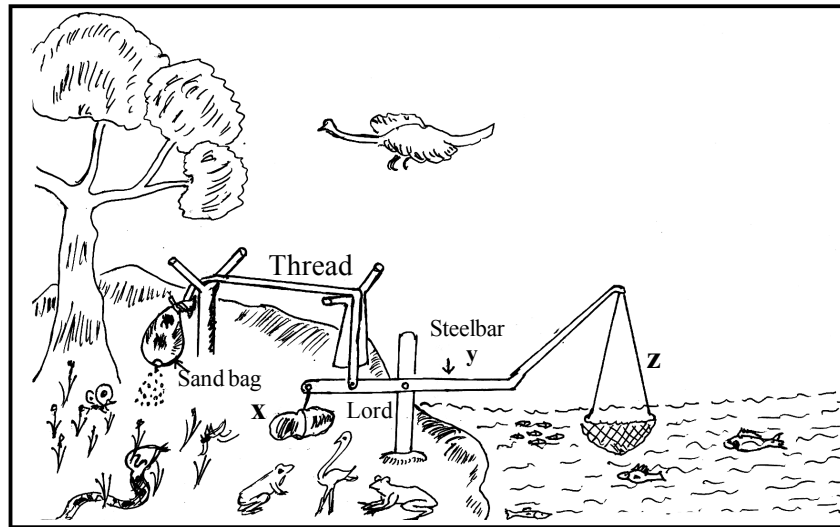
Index No :

Marks :

- ◆ *Science part II is composed of two sections A and B.*
- ◆ *Write the answers for the section IIA on the paper itself within the space provided.*
- ◆ *Questions from the sections Biology, Physics and Chemistry are given in Part IIB. Answer three questions by selecting one from each section.*

Part II A Structured Essay Questions

01.

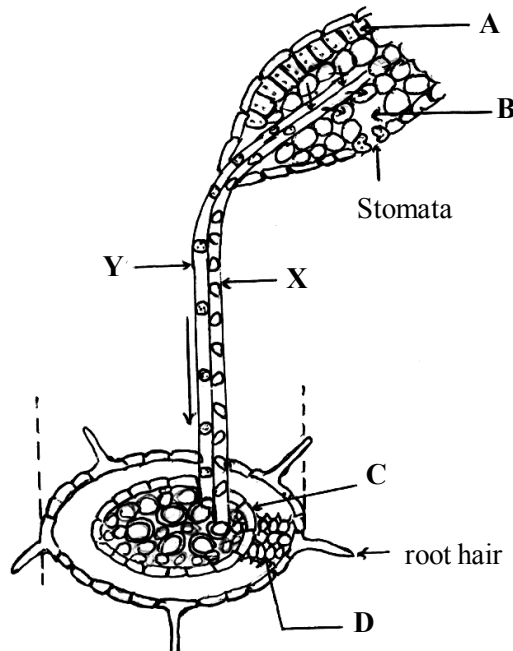


In a large fresh water pond an automatic simple machine used to catch fish is shown in the diagram. Students who went on a field trip put forward the following observations.

1. Concentration of heavy metal was found in more percentage in fishes.
 2. The BOD value of water was 1.5ppm.
 3. Eutrophication has taken place to a certain extent.
- A) 1. a. Name the organisms which increases in number during eutrophication.
-
- b. To which group the above said organisms belongs to.
-
2. Write a food chain which has three links.
-
3. Mention two special adaptations found in frog to suit this environment.
- i.
- ii.
4. When fish is caught with the help of the given simple machine, give one disadvantage regarding organisms living there.
-

- B)**
- Which type of lever is functioning in the simple machine when the net is lifted.
.....
 - Mention the structure that helps here for the automatic function?
.....
 - To increase the efficiency of this lever what should be done at x.
.....
 - Label the parts through which energy is transmitted and write a special property it should have?
.....
.....
 - When the net was at 5 m depth of the pond find out the pressure acting on it.
(gravitational acceleration 10 ms^{-2} , density 10^3 gm^{-3})
.....
- C)**
- Name two gases evolved in the pond where eutrophication has taken place.
 -
 -
 - “Citrianna” grass was grown around this pond.
 - For which industrial purpose does this grass is grown?
.....
 - Write the method by which the above mentioned substance is extracted?
.....
-

02) A.



The diagram above, shows the transport of substances in plants.

- Name the structures A, B, C and D.
A..... B.....
C..... D.....
 - What are the substances absorbed by the root hair.
.....

- c) Name the places in which the substances are transported by the following methods.
- Osmosis.....
 - Selective absorption.....
 - Mass flow.....

2) a) Identify 'X'

.....

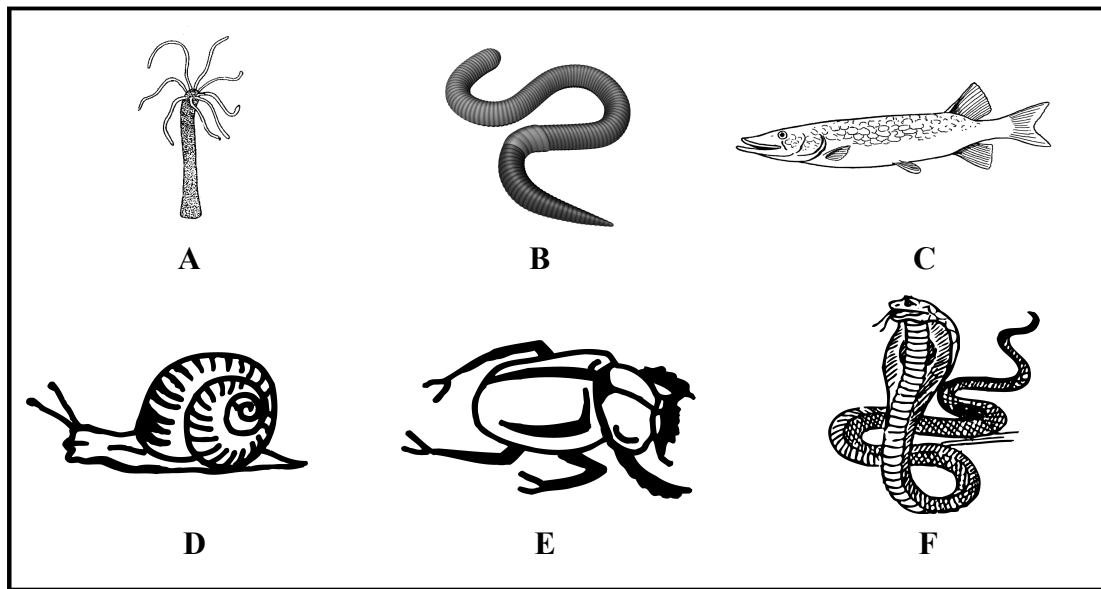
b) Give a structural difference between X and Y.

.....

c) Which substance is transported through Y.

.....

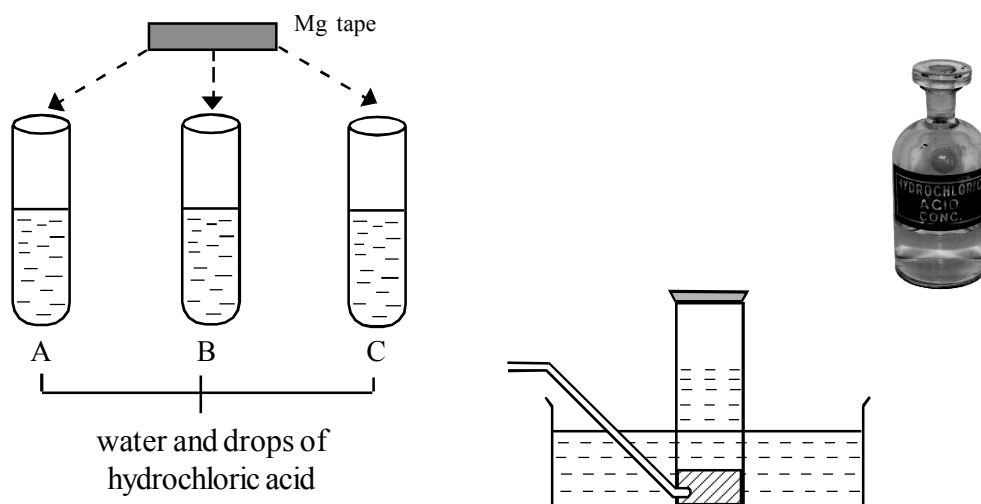
B. Organisms of different ecosystems are given below.



a) Select the suitable organism to suit the relevant features.

- Dry skin with scales and without glands.
- Having radial symmetry
 - Homeothermic
 - Exoskeleton made up of calcium carbonate.
 - Organism with hydrostatic skeleton.

- 03) A) The figure below shows the experiment, set by a group of students to find the factor that influences the rate of reaction.



Three similar test tubes with equal amount of water were labelled as A,B and C. One, two and three drops of concentrated Hydrochloric acid was added to each test tube, separately, but not in order. The acid drops were added without changing the total volume of liquid in the test tubes. Then to each test tube Magnesium strips of equal length were added. The volume of gas produced in each test tube. for a particular time (equal for all the tubes) were measured and a chart was prepared. Answer the question below using the data given above.

- To identify which factor that affects the rate of reaction, does the above said experiment is carried out.
.....
- Which equipment is used to add Hydrochloric acid drops.
.....
- What is the volume of a drop of Hydrochloric acid.
.....
- Write the equation for the reaction that takes place when adding Mg strip into the test tubes
Mention the states of the reactants and products.
.....
- The table below shows the number of drops of Hydrochloric acid added and the volume of gases produced in each tube. Fill in the blanks of the table with suitable answer.

Test tube	No of acid drops added	volume of gas produced in cm ³
A
B	2	6 cm ³
C	1

- Find the volume of the gas produced in B, if the pressure is increased from the atmospheric pressure to 152 cmHg. (The atmospheric pressure is 76 cmHg.)
.....
- Which quantities were kept constant in the law used by you to find the volume in the above question.
.....

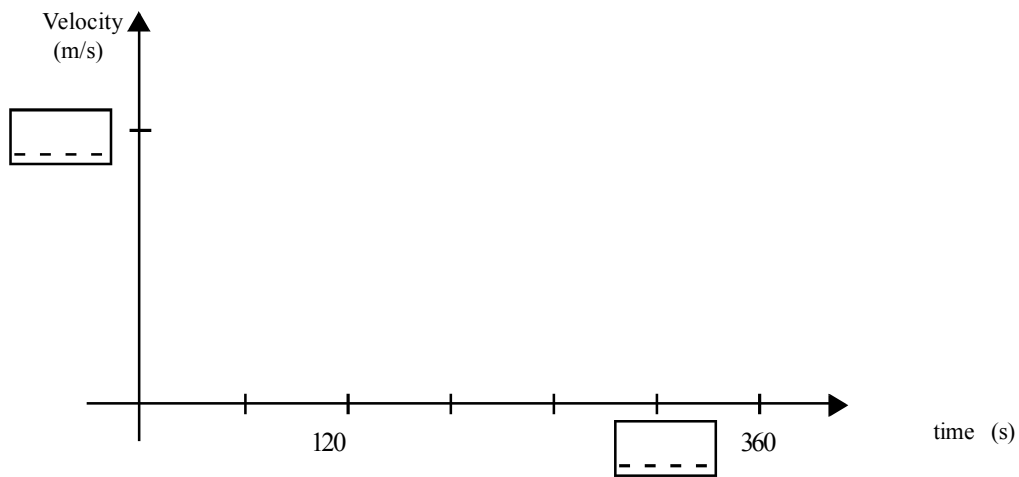
B) Names of some chemical substances used in our day to day life are given below. Select the suitable chemicals for the following questions.

Monosodiumglutamate, Sachcharin, Butylated hydroxy Toluene, carotene, Sodiuibicarbonate, Magnesium hydroxide, Sulphurdioxide, Common salt, Sulphur, Asprin and Vitamins.

1. The chemical that protects food by reducing the action of oxygen.
.....
2. Natural substance used for colouring.
.....
3. The chemical that soften or give the lightness to the food.
.....
4. Substance that increase the taste.
.....
5. The substance used to reduce the acidity in the stomach.
.....

04) A) Mass of a toy car is 2 4kg, moves from rest and gradually increases its velocity in 2 minutes. It gains 60 m/s velocity. Then it moves 3 minutes with gained velocity and then finally velocity decreases and came to rest by applying the break.

- i. What do you mean by velocity?
.....
- ii. Draw the velocity - time graph for the motion of the toy car and mark the values in the given boxes.



- iii. In first 2 minutes toy car is in acceleration. Find out the acceleration of this toy car.
accelerate = =
- iv. Find out the unbalanced force need to get this acceleration.
..... =
..... = =
- v. Which law is used in your calculation to find out the force?
.....

B) The Co-efficient of friction between the toy car and the road is calculated by an experiment as 0.2.

i. In which factors frictional force depend on?

1.

2.

ii. Find out the acting frictional force between the toy car and the path?

.....

.....

iii. What is the total force needed to gain the acceleration calculate in question no A(ii)?

.....

C) Energy can neither be created nor destroyed and transformed from one form to another.

i. Which law is explained by this given paragraph?

.....

ii. What is the form of energy found in the following instances.

a. water in reservoir

b. flowing water.....

c. Stretched rubber band.....

iii. A fruit of 50 g is at 5 m height on a mangotree. Consider the gravitational acceleration as 10 ms^{-2}

a) Calculate the potential energy of mango?

..... x x =

b) If this Mango falls from the tree, find out the velocity with which it strikes the ground.

Kinetic energy=

$v^2 =$

$v =$



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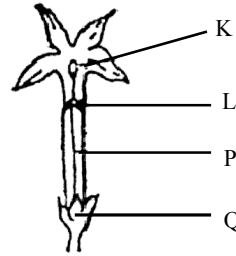
Part II B Essay questions

Biology

05)



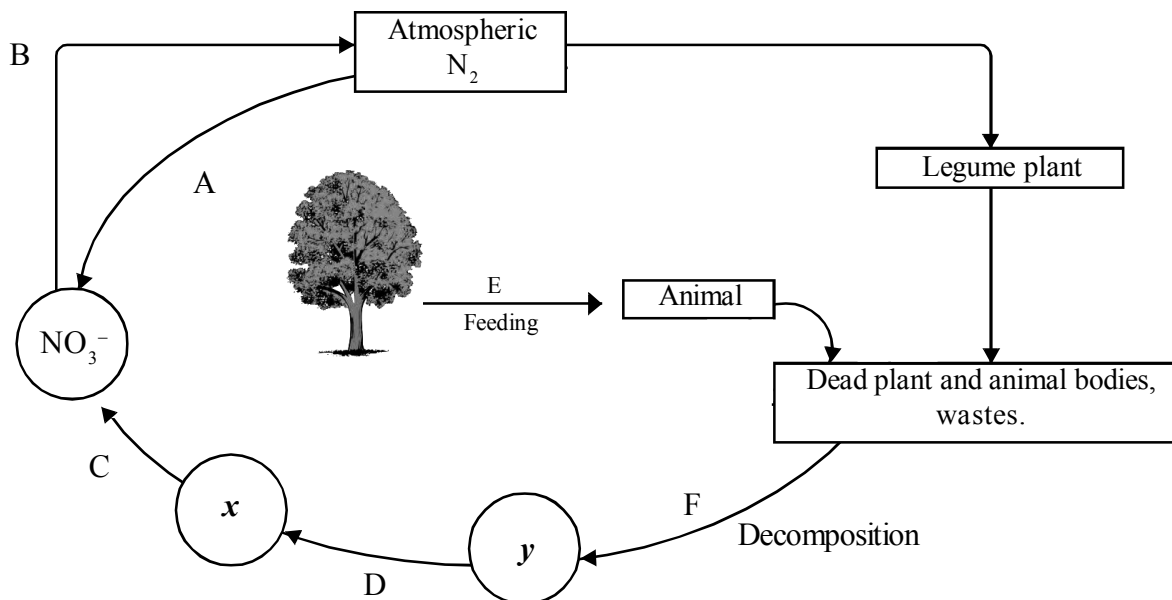
Clerodendron



Jasmin

- A)** a) What are the two types of reproductiv methods found in plants.
b) Give one advantage of each method mentioned above.
- B)** The flowers given in the diagram above show adaptations to prevent self pollination.
- a) What is self pollination.
b) Name the parts K, L, P ad Q
c) Which letters indicate the gynaecium of the flower.
d) What are the techniques found in the above flowers to avoid self pollination.
c) Give two other adaptations, with examples to prevent self pollination.
- C)** Thalasemia is a diseas caused by a mutated gene found in the autosome and responsible for the produc-
tion of Haemoglobin. Disease is caused in recessive homozygous condition. The dominant homozygous
condition is normal and the heterozygous is a carrier.
- a) Explain the following.
1. Mutation 2. Heterozygous condition.
b) Considering the symbol of the gene for normal halmnoglobin as T , write the genotype of
diseased and carrier persons.
c) Explain the disease conditions of the children, if a normal male marries a carrier female.

06)



A) The resources of the abiotic environment, which are used by living organisms, are added back to the environment by circulating in a cycle. Such a cycle is shown in the above diagram.

- I.
 - a) How the above cycle is called?
 - b) Name another source that under goes similar cycle.

- II.
 - a) Select the suitable words from the below, that should be in place of A, B, C and D.
Denitrification / Nitrogen fixing / Lightning / Nitrate fixing / Nitrite fixing
 - b) Name the substances denoted by the letters x and y .
 - c) Which group of organisms is represented by the letter F.

III. Explain why, plants like hemp and green gram are cultivated in paddy fields.

IV. Addition of non bio degradable organic substances to the environment causes. harmful effects. Give two such organic compounds which are non biodegradable.

B) Survival of organisms on earth is threatened by human activities. Various conservation methods are carried out to protect these organisms. One of the such methods is in - situ conservation.

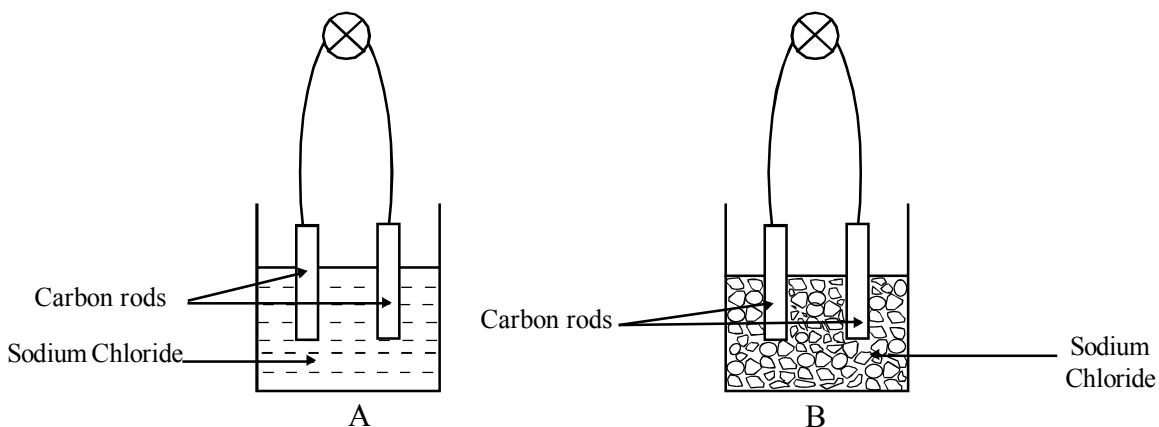
- I.
 - a) Give two methods of in -situ conservation.
 - b) Write two human activities which lead to the extinction of the organisms.
 - c) Name an organism which is thertened to extinct in Sri Lanka.

II. In the early days D.D.T was used to eardicate mosquitoes Later - on DDT was not effective against mosquitoes.

- a) Give two unfavourable effects of environment caused by the use of DDT
- b) Explain the reason for the failure in controlling the mosquitoes by DDT

Chemistry

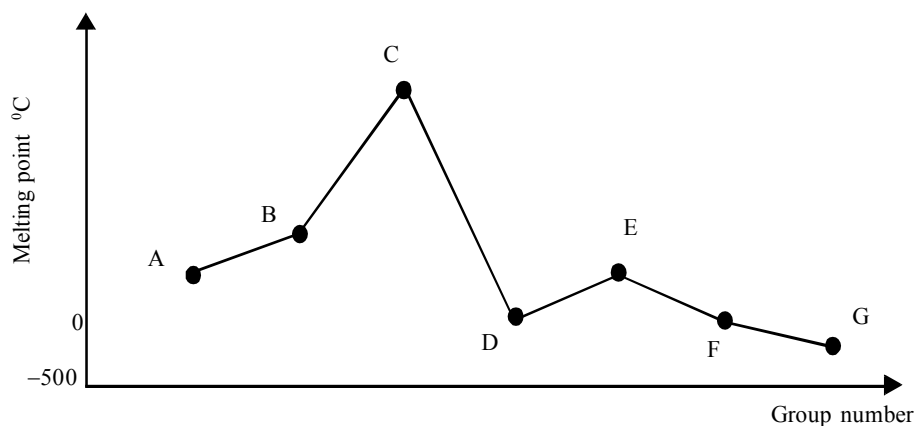
- 07) A) Chemical compounds exist in ionic lattice, molecular lattice and crystal lattice, Ionic compounds have high melting points.



The above set up was arranged by Grade.10 students in order to find out a special features of conducting electricity.

- 1) Rectify the defect found in the above setup and re draw the setup.
- 2) Write your observations in A and B and give the reason for your answer.
- 3) a. Draw the bond formation of sodium chloride using the number of electrons in the last shell.
b. What kind of bond is formed between sodium and chlorine.
- 4) Mention another one compound which has the same kind of bond mentioned in Q3(b)

B)



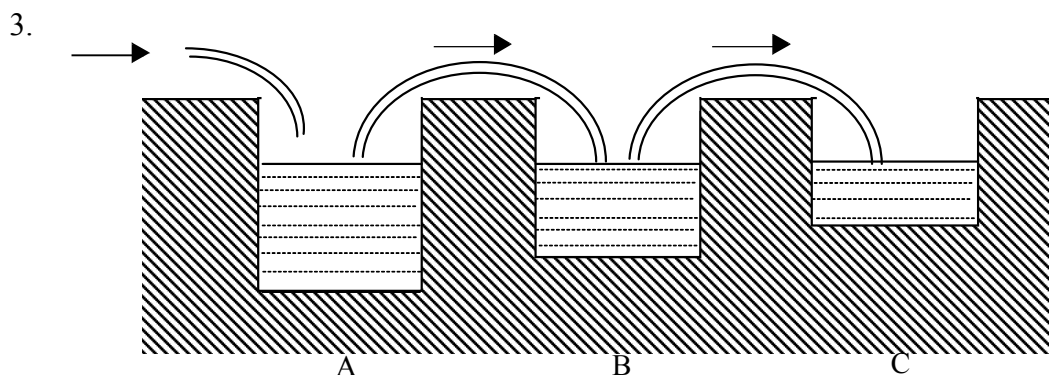
Here E is a diatomic gas which has bleaching effect. Answer the questions using the given alphabet only.

1. Name a
 - I. Metal
 - II. Metalloid
 - III. Monoatomic gas
2. Element which is used to prepare match stick is burn t in air. Which is the colour of the flame produced?
3. Mention a metal which is extracted by elctrolysis.
4. Write the balanced equation for the reaction of A with steam.

- C) The following instructions were written on a wall paper regarding fire accidents.
If your clothes catch fire,
- I. Roll on the ground
 - II. Do not run
1. Give the scientific reasons for the given instructions.
 2. Write the name of the fire extenguisher that should be used at this instance.
 3. Mention the other two factors which should be removed to reduce the spreading of fire.

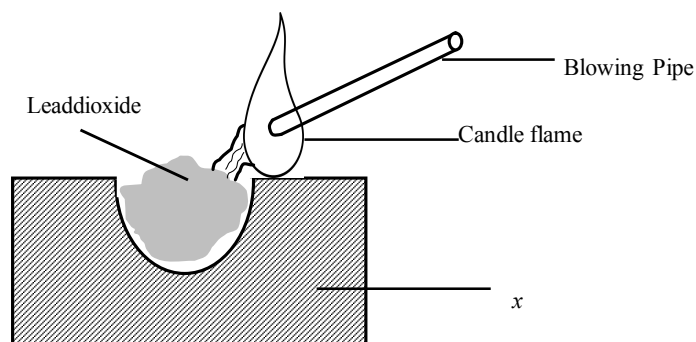
08) The value of land increases when natural resources used for industries are identified in those areas.

- A) 1. Mention the methods by which sodium chloride is obtained in Sri Lanka.
2. Give a climatic feature and a feature. that the land / soil should have when choosing a place for saltern.



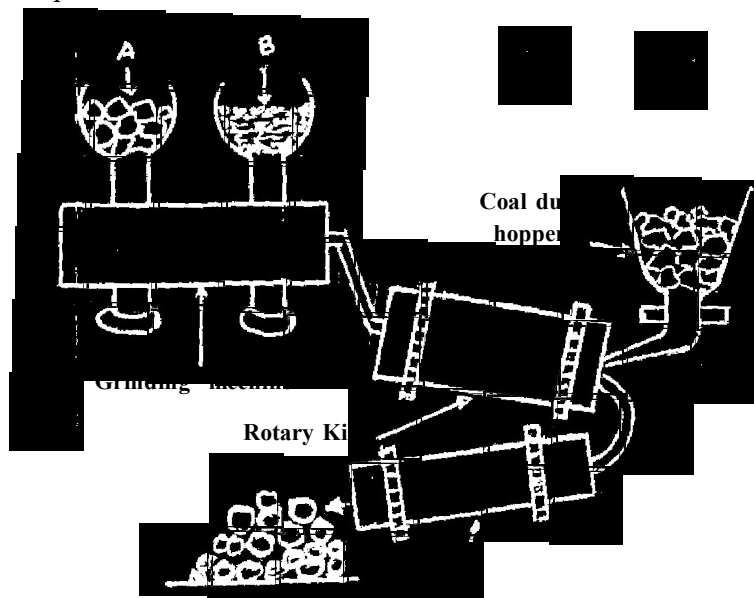
A, B and C are tanks in which sea water is pumped during the production of salt.

1. In which tank CaCO_3 get precipitated.
 2. Mention the change that takes place in the tank B.
 3. What are the impurities found in the salt crystallises in the tank C.
- B) When Leaddioxide was heated as shown in the diagram using bunsen flame and a blowing pipe ,shiny grey colored. balls surrounded with yellow layer were formed.



1. Identify the strucure X.
2. What was obtained in the form of shiny grey balls.
3. How would you confirm the answer given in question number (2)
4. Write the chemical equation for the reaction that took place in the above activity.

C) The figure shows the production of cement.



1. Write the chemical reactions that occur in the rotary kiln.
2. What is the substance obtained by cooling part x.
3. What is the advantage of grinding and sending the raw materials into rotary kiln.
4. What are the two disadvantages of using the above setup to obtain quick lime from limestone.

Physics

09) A)

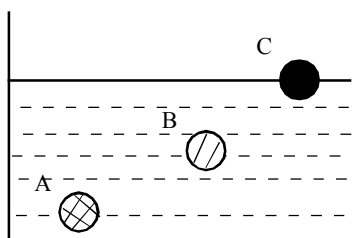


Figure (i)

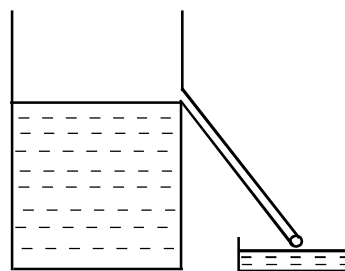


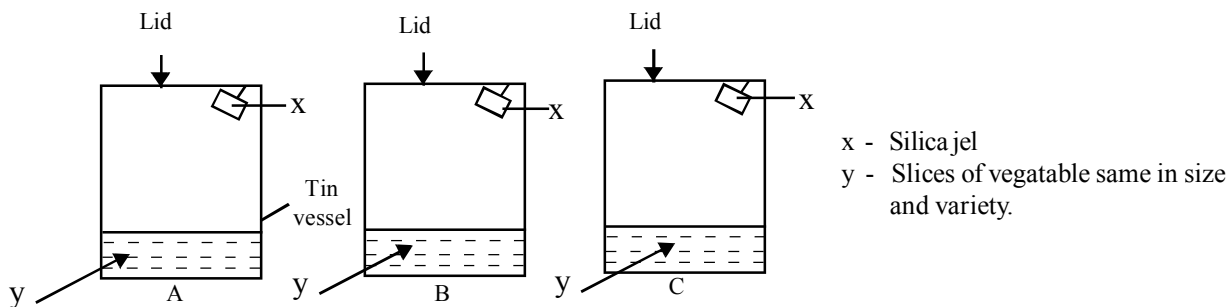
Figure (ii)

Figure (i) shows the positions of spheres with same volume and made by various substances.

Water level in vessel is shown in figure(ii) and each sphere is put in water separately ; water is collected and weighed.

- i. Which sphere has the highest mass and which has the lowest mass?
- ii. Density of the substances used to make the spheres A, B and C respectively are d_A , d_B and d_C .
Write the ascending order of densities of the substances which are used to make the spheres
- iii. Which sphere or spheres displace more water?
- iv. In which instance or instances weight of displaced water is equal to the weight of sphere?

B)



These experimental setups are related with transmission methods of heat made by a group of students. One tin is painted black next one is white and third one is by lustric paint. Same vegetables of equal sizes were put in each vessel placed in same environment for getting solar energy.

A	B	C
less dried	more dried	slightly dried

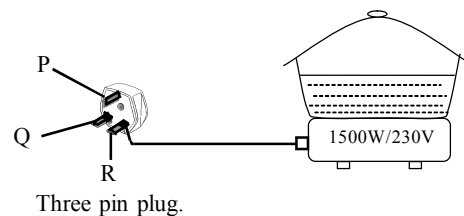
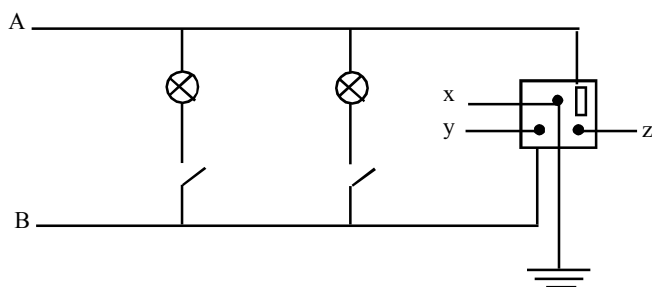
- i. According to the instructions and observations identify the paints A, B and C.
- ii. Write the conclusions?

C) The reflected sound that we hear clearly after a time lag from the original sound is called an echo.

- i. How long the sound that we hear remains in our memory
- ii. Write the equation for the minimum distance between the source of sound and reflecting surface using the following data.
 - The distance between source of sound and surface = d
 - Velocity of sound in air = v
 Time duration between original sound and reflected sound = t
- iii. Find out the minimum distance between the source of sound and surface to hear an echo?
(Consider the speed of sound in air is 330 ms^{-1})

10) Electrical energy produced in Sri Lanka National grid is converted into different forms. Effects of electricity are used to fulfill our energy needs and in communication.

A. Part of National grid is shown below.



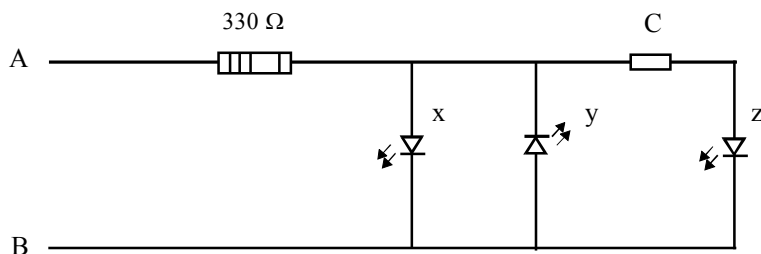
1. Name the service wires A and B?

2.
 - a. What is the potential difference of the domestic supply?
 - b. Write the type of electric current?
 - c. What is the frequency of electric current?
 - d. Identify the relevant wires to which Q and R should be connected in x , y, z.

3. Observe the label of the electric cooker and write the answer.
 - a. What do you understand by 1500W.
 - b. When this electric cooker is completely in function find out the current flows through the heating coil?

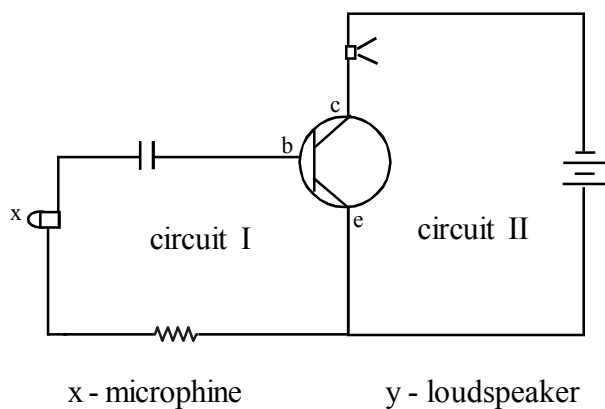
4. 800g water at 30°C is taken in a thin light Aluminium vessel is placed on the given electric cooker which covers the cooker completely and electric current is supplied to cooker.
 - a. Write the advantage by the flattened bottom of the Aluminium vessel.
 - b. Which property of Aluminium is responsible for its low heat capacity.
 - c. If the heat capacity of the aluminium vessel is less ; What can you say about the time taken to water to reach the boiling point (time increase or decrease)
 - d. Write the time taken in second which is needed the water to reach the boiling point?

- B) Circuit made with light emitting diodes is used to differentiate the type of electric currents obtained by electric cell and bicycle dynamo is shown in the diagram.



- 1) If the positive terminal of electric cell is connected with A and negative terminal of electric cell is connected with B; which light emitting diodes light up ?
- 2) If the terminals of electric cell changed, which light emitting diodes light up?
- 3) If 6V dynamo is connected across the terminals. A, B and rotated, speedily which light emitting diodes light up?
- 4) What function is done by 330Ω in this circuit?
- 5) Write the function of component C.

- C) The circuit of is shown in the diagram.



- 1) What type of transistor is used in this circuit.
- 2) write the name of circuit (i) and (ii)?
- 3) Which circuit is in reverse biased (circuit(i) or circuit (ii))
- 4) Write the function of the capacitor in the given circuit?
