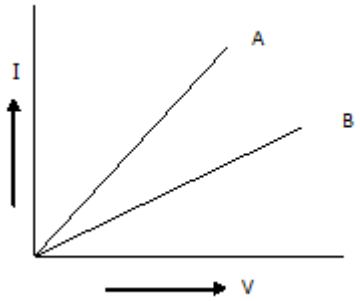
SAMPLE PAPER September 2014 (SA-I)-05

Subject- Science

Time:- 3Hrs. Class –X Maximum Marks 90

Section A

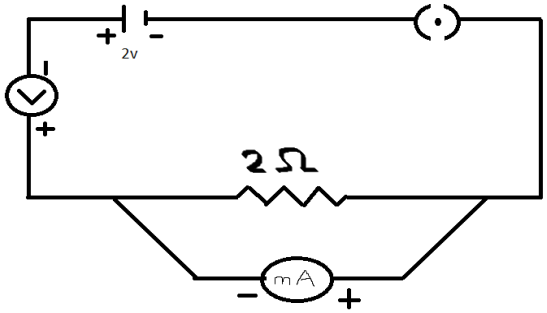
1. Write balanced chemical equation for the reaction taking place when limestone is heated strongly.
2. A copper wire has a resistance R and specific resistance p. It is stretched to double its initial length. How will. How will its (a) resistance (ii) specific resistance be affected in stretching?
3. V-I graphs for series and parallel combinations of two metallic resistors are as shown . which one of two represents parallel reaction ?



4. When a solution of potassium chloride is mixed with silver nitrate solution ,an insoluble white substance is formed . Write the balanced equation for the reaction and also name the type of chemical reaction.
5. A drop of litmus solution is added to each of the four solutions givebelow . State the color of litmus solution observes in each .
   (a) Soap solution
   (b) Sodium carbonate
   (c) Vinegar
   (d) Lemon juice
6. How does the strength of the magnetic field at the center of a current carrying circular coil of a wire changes on (a)increasing the radius of the coil (b)decreasing the number of turns in the coil. Justify your answer in each case.
7. What are the final products of carbohydrates , proteins and fats after their digestion ?
8. (a) What are redox reactions?
   (b)Why is the reaction between magnese dioxide and hydrochloric acid is called a redox reaction?
9. Explain reflex arc and reflex action with the help of a labeled diagram.
10. Explain why :
    (a) Respiration is an exothermic reaction
    (b) All decomposition reactions are endothermic reactions .

(c) When blue salt of copper sulphate is heated , it becomes colorless.

11. A student wrongly draws the given circuit diagram for verification of ohm's law. Assume that voltmeter and milliammeter are perfect/ ideal in nature.
    Answer the following questions on the circuit diagrams



    (i) What will be the voltmeter readings in this case and why ?
    (ii) Point out two major mistakes made by the student in drawing the circuit diagram.
    (iii) Re-draw the circuit diagram correctly.

12. A gas is produced when conc. H 2SO 4is added to solid sodium chloride solution taken in a test tube .the gas coming out of the delivery tube is passed over a dry litmus paper and then over a moist blue litmus paper. What would you observe? Give reasons for your observation and write the corresponding balanced chemical equation .
13. Name the various forms of energy available from the sea. Write any three limitations in harnessing these energies.
14. Name the type of chemical reaction represented by the following equations:
    (i) $CaCO3(S) \longrightarrow CaO(s)+CO2$
    (ii) $CaO(s) + H2O \quad Ca(OH)2(aq)$
    (iii) $Zn(s) + H2SO4(aq) \quad ZnSO4(aq) + H2(g)$
15. Which organ secretes a hormone when blood sugar rises in our body? Name the hormone and name one enzyme released by this organ?
16. (a) Out of two solar cookers ,one was covered with a plane glass slab and the other was left open. Which of the two solar cookers will be more efficient and why ?
    (a)List any two disadvantages of using biomass as a fule.

17. A junior scientist in a leading dental cream manufacturing company discovers that the addition of a certain element to a dental; cream can bring about a significant improvement in the quality of product in controlling tooth disease. however ,she also discovers the same element can also result in one in a million cases of user ,getting a deadly disease. The scientist report her result in full in board's meeting.

Assuming that you are the CEO of the company , answer the following questions on the bases of above information:

(i) Should the company go ahead with manufacturing the product without sharing the ill effect of the product? give reasons for your answer.
(ii) How will you respond to a suggestion from a colleague that the company should do more research for reducing the ill effect before manufacturing the product.
(iii) Which values are promoted through this anecdote.

18. Match the type of electric current on its source voltage in column I withal the correct statements in column II.

Column I	Column II
I. Direct current II. Alternating current	(i) Its direction of flow in a circuit changes periodically (ii) Its magnitude continuously. (iii) Its direction of flow in a circuit always remains the same. (iv) Its magnitude always remains the same. (v) Its frequency is zero. (vi) Its frequency in India is 50 Hz. (vii) It can be used for producing heat in a metallic conductor. (viii) Its source voltage cannot be used for carrying out electroplating.

(b) Write two advantages of connecting domestic electrical appliances in parallel circuit arrangement and not in series circuit arrangement.]

19. In a village people burn wood and cow dung as a fuel for basic necessity. In other nearby village, they have bio gas plant in which bio waste is used to prepare bio gas. If we compare the situation of both village, which practice you will prefer the best and why?

20. (a) Draw the diagram of human heart and label the parts which

(i) receive oxygenated blood from vena cava,

(ii) send deoxygenated blood to lung through pulmonary artery,

21.(a) State fleming's right hand rule.

(b) A coil of insulated copper wire is connected to a galvanometer. What will be observed if a bar magnet is

(i) Pushed into the coil

(ii) Withdrawn from inside the coil,

(iii)Held stationery inside the coil?

22. (a) what causes rusting of iron? Design an activity to show the conditions needed for iron nail to get rusted.

(b) Why do we paint iron nails.

23. What causes tendril to encircle or coil around the object in contact with it ?explain the process involved.

(b)what is chemotropism ? give one example.

24. (a)What is a chemical name of baking soda ? Write the chemical reaction involved in its preparation. Write its one use.

(b)Give the chemical names of acids present in (i) ants (ii)lemon (iii)milk (iv)tomato.

Section –B

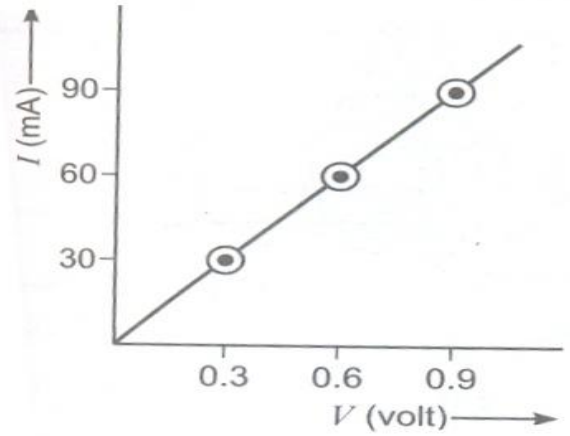
25. Iron fillings were added to a solution of copper sulphate. After 10 min , it was observed that the blue color of solution has changed and a layer has deposited on iron fillings . which one of the following set of color correspond to the color of the solution and the color of coating respectively?

A. Yellow and green B. Brown and blue C. Red and greenish blue D. Light green and reddish brown

26.A student connects a circuit to study Ohm's law using a resister of 3 ohm and a battery eliminator of 6 v. Which of the ammeter should be chosen to read the value of current for this circuit if the ammeters available in the laboratory have the following ranges?

a. 0-200 mA b. 0-100mA c. 0-1 A d. 0-2 A

27. While performing the experiment of Ohm's law , a student has plotted the following graph. The resistence of the conductor will be



(a) 1000Ω (b)10 Ω

(c)100V (d)1Ω

28. In an experiment to show that sunlight is necessary for photosynthesis , the leaf is boiled in alcohol for few minutes using a water bath. It is essential to use water bath because

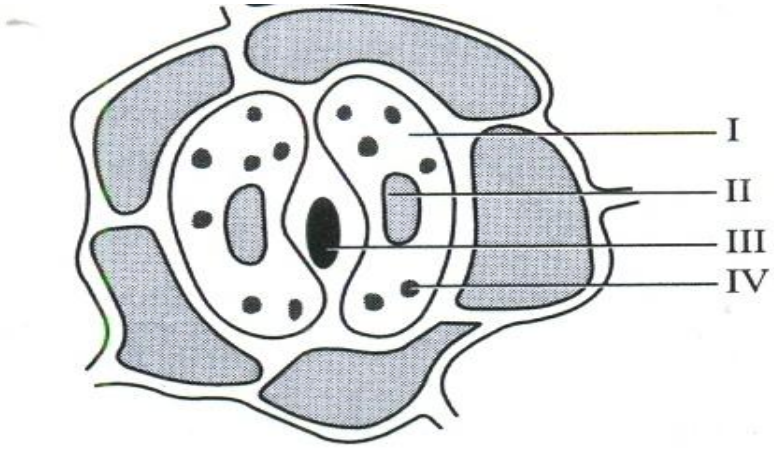
(a) Alcohol is highly volatile (b)Steam from the water bath heats the leaf rapidly

(c) Steam from the water bath dissolves the chlorophyll (d)Alcohol is flammable

29.Thecolour of sky is blue due to

(a) reflection of light (b)refraction of light (c)interference of light (d) scattering of light.

30 A student draws the following sketch of stomatal apparatus. The parts I, II, III and IV are labeled differently by four students:



The correct labeling of the following is

(a) I GUARD CELL II stoma
III starch granule III nucleus

(b) I Cytoplasm II Nucleus
III Stoma IV Chloroplast

(c) I Guard cell II Starch granule
III Nucleus IV Stoma

(d) I cytoplasm II Chloroplast
III Stoma IV Nucleus

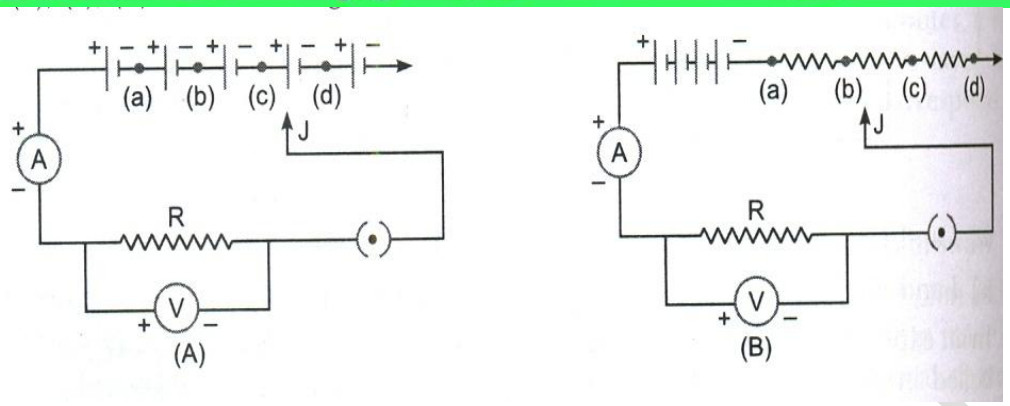
30. A student drops few drops of universal indicator to an aqueous solution of sodium hydroxide. He would observe that the coliur of the solution changes from

(a) colourless to red

(b) colourless to blue

(c) red to blue

(d) blue to red

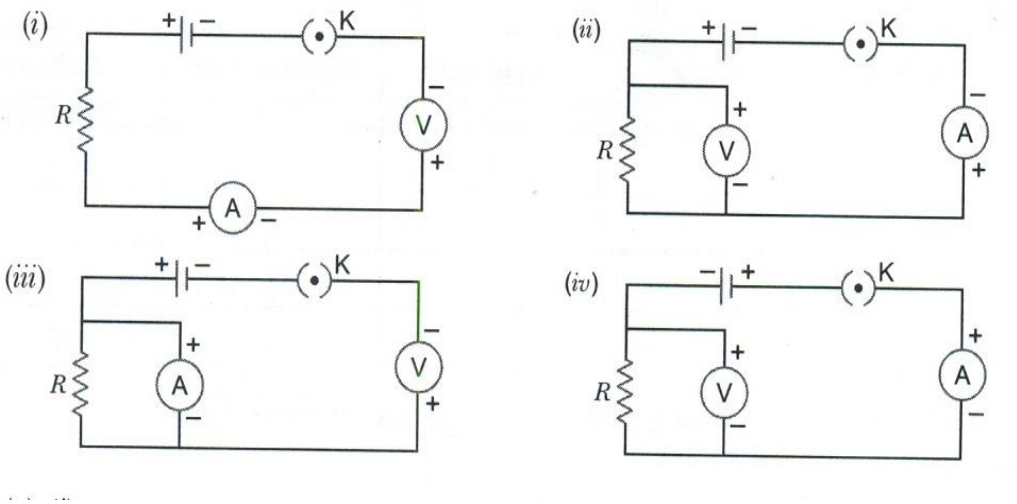


31. To study the dependence of current(I) on a potential difference (V) across a resistor R, two students used the two set ups shown in figures A and B respectively. They kept the contact point J in four different positions marked,(a),(b),(c),(d) in two figures.

For the students the ammeter and voltmeter readings will be maximum when the contact J is in the position

(a) D in both the set ups
(b) A in both the set ups
(c) D in set up A and a in set up B
(d) A in set up a and d in set up B

32. Identify the circuit diagram in which the electrical components have been properly connected



(a) I
(b) ii
(c) iii
(d) iv

34. A black strip of paper was dipped on to a destarched leaf in a potted plant to cover a part of the leaf. The plant was then exposed to sunlight for four hours, the paper strip was removed and the leaf tested for starch. When the iodine solution was added

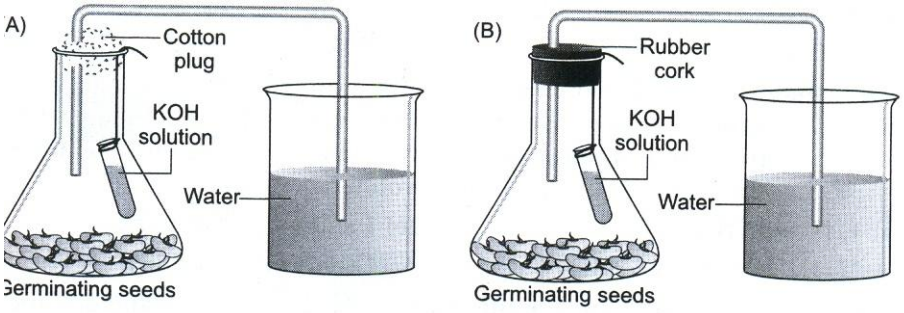
(a) the entire leaf turned blue-black

(b) the covered part of the leaf became blue – black

(c) the uncovered part of the leaf became blue – black

(d) thecolour of iodine solution remain unchanged

35. Using the same number of given germinating seeds, two students set up the experiment separately. Student A used cotton plug to hold the bent tube to the mouth of the flask. Student B used air tight rubber cork.



Which one of the following is to be observed after a few hours?

(a) Water level would rise in the bent tube of A.
(b) Water level would rise in the bent tube of B.
(c) The cotton would become wet.
(d) The water in the beaker of B would turn milky.

36. Four students (A), (B), (C) and (D) separately measured the pH values of each one of the given samples of distilled water, acetic acid, dilute hydrochloric acid, and a solution of sodium hydroxide using pH papers.

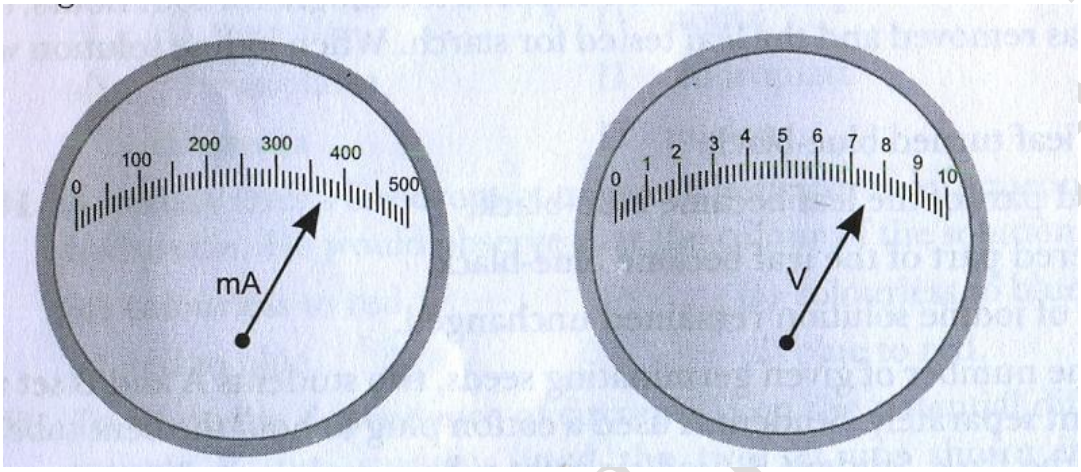
Student	Water	Acetic acid	Hydrochloric acid	Sodium hydroxide
(a)	7	1	1	1
(b)	7	3	1	1
(c)	7	1	1	13
(d)	7	3	1	13

Which one of the following represents a correct measurement?

(a) A (b) B

(c) C (d) D

37. The current flowing through a conductor and the potential difference across its two ends are as per the reading of the ammeter and the voltmeter shown in the figure. The resistence of the conductor would be:



(a) 0.175 Ω
(b) 1.75 Ω
(c) 17.5 Ω
(d) 175 Ω

38. Four solutions I, II, III and IV were given to a student to test their acidic or basic nature by using pH papers. He observed that the colour of pH paper turned to red, blue, green and orange respectively when dipped in four solutions. The correct conclusion made by the student would be

(a) I, II and III are acidic.
(b) I and IV are acidic.
(c) II, III and IV are acidic.
(d) (d)II and IV are acidic.

39. When a student added zinc granules to dilute HCL a colourless and odourless gas evolved .On testing with a burning match stick it was observed that the match stick

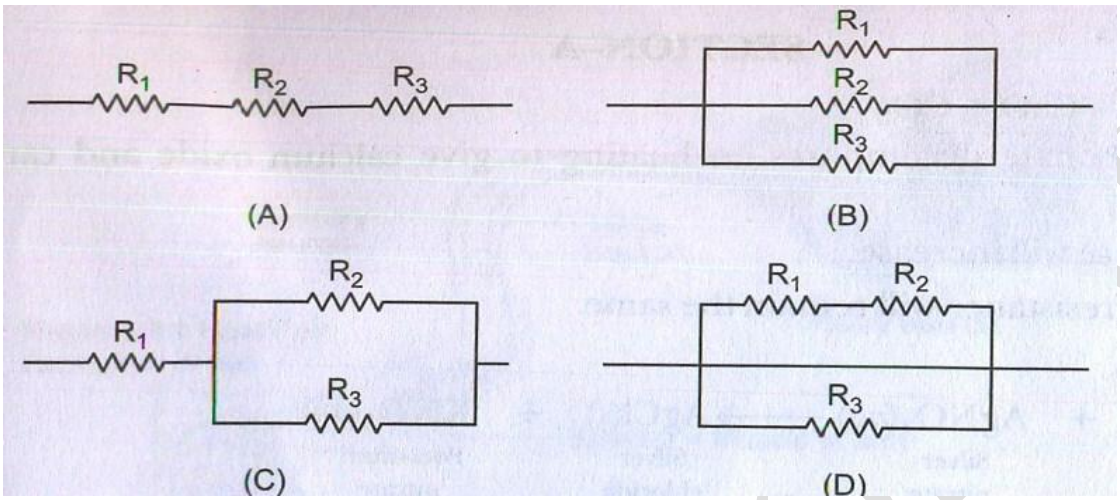
(a) continued to burn brilliantly.

(b) burnt slowly with a blue flame

(c) extinguished and the gas burned with a pop sound

(d) continued to burn brilliantly and the gas burnt with a pop sound.

40.To determine the equivalent resistence of the three resistors arranged in parallel four students connected the resistors as shown in the figures A, B, C and D.



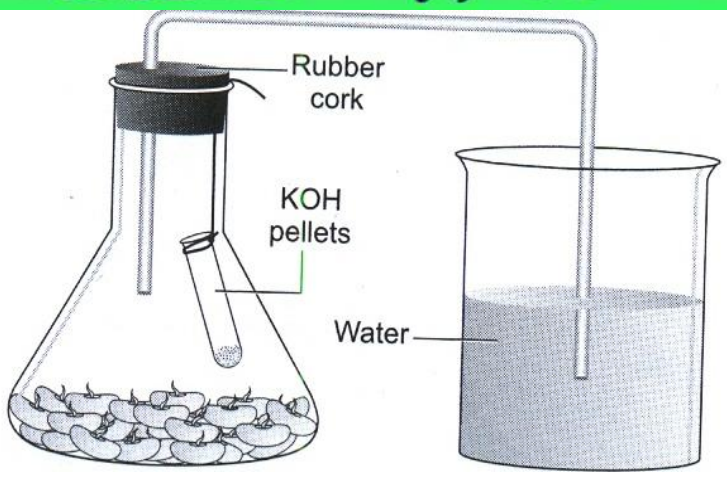
The correct set up is that of student:

(a) A
(b) B
(c) C
(d) D

41. The correct set of the three precautions for setting up the experiment to demonstrate that CO_2 is evolved during respiration is:

(a) Thread holding KOH test tube, air tight flask, delivery tube above water surface in the beaker.
(b) Flask has just germinated seeds, airtight set up, delivery tube dip in water in beaker.
(c) Flask has seeds covered with water, airtight set up, KOH test tube held by a thick wire.
(d) Just germinated seeds under water in the flask, delivery tube above water level, thread holding KOH test tube.

42. In the following experiment set up a small test tube containing KOH pellets is kept in the conical flask to absorb:



Germinating seeds

(a) Air in the flask . (b) Moisture in the flask (c) Oxygen in the flask (d)CO_2 released by the germinating seed during respiration.

MODEL ANSWERS SAMPLE PAPER September 2014 (SA-I)-05

Section-A

1. $CaCo3 \xrightarrow{} CaO + Co2$

Calcium carbonate decomposes on heating to give calcium oxide andcarbon dioxide.

2. (i) Resistence will increase

   (ii)Specific resistence

3. Graph A.

4. $KCl(aq.) + AgNo3(aq.) \xrightarrow{} AgCl(s) + KNo3(aq.)$

   Potassium Chloide — Silver nitrate — Silver Chloride — Potassium Nitrate

   Double Displacement Reaction

5. Soap Solution : Blue
   Sodium Carbonate Solution : Blue
   Vinegar : Red
   Lemon Juice : Red

6. (i) The field Decreases.
   (ii) The field increases

7. Carbohydrate-Glucose
   Proteins-amino acid
   Fats-Glycerol + Fatty acid

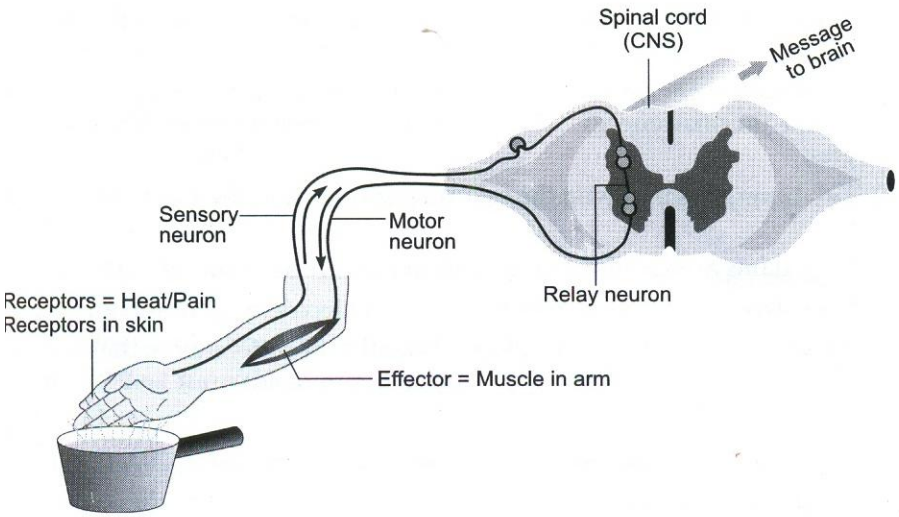
8. (a) Redox reaction is a process in which oxidation and reduction are taking place continuously.

(b) Because MnO_2 is reduced to $MnCl_2$and HCL is oxidized to H_2O.

(c) Oxidising agent- HCL

Reducing agent-MnO_2

9.



Labelled diagram with labelling of sensory neuron, spinal cord, motor neuron. **2**

Reflex action is the immediate response of the spinal cord to a sudden impulse. **1**

10.(a)C_6H12O_6(aq.) + $6O_2$ ⟶ CO_2(aq) + $6H_2O$(l) + Energy

(b)Energy is in the form of Heat light or electricity is required for decomposition reactions.

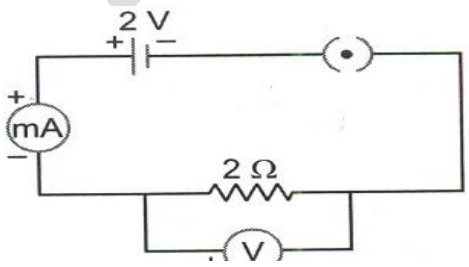
(c)CuSO4.5H2O ⟶ CuSO4 + 5H2O

11. (i) The reading of voltmeter as well as ammeter will be nearly zero. This is due to the reason that the voltmeter has a very large resistance. Since it is connected in a series in a circuit, the current flowing in the circuit will be nearly zero.

(ii) (a) Voltmeter is connected in series and ammeter is connected in parallel.

(b) '+' and '-' terminals of a as well as ammeter are connected wrongly.

(iii)



12. HCL gas is produced.

$2NaCl + H2SO_4 \longrightarrow Na_2SO_4 + HCL$

When the gas is passed through a dry litmus paper , there is no change in colour because it cannot show acidic properties as H+ions are not present.

The gas when passed through a moist litmus paper colour is changed to red as it shows acidic properties. Because H+ions are producedwhen HCL dissolves in water.

13.Various forms of energy obtained from the ocean are tidal energy, wave energy, and ocean thermal energies.

(i)Tidal energy depends on the relative positioning of the Earth, moon, and the Sun.

(ii)High dams are required to built to convert tidal energy into electrical energy.

(iii)Very strong waves are required to obtain electricity from the wave energy.

(iv) To harness Ocean thermal energy efficiently, the difference in temperature of surface water and the water at the depth must be 20 C or more.

14.(i) Decomposition reaction /endothermic (ii) Combination reaction/ Exothermic

(iii) Displacement reaction

15. (i)Pancreas (ii)Insulin (iii)trypsin/lipase

16. (a)The solar cooker cover with a plane glass will be more efficient.

Because plane glass slab which covers the solar cooker trap solar radiations and prevent the heat to escape from solar cooker.

(b) (i) Produces smoke. (ii) Gives less heat energy.

17. (i) No, the ill effects of the product should be avoided at all costs even if it is on one in a million cases.

(ii) Yes. The company should take initiative for continuous research to minimize ill effects.

(iii) Intellectual honesty, professional ethics.

18. (a) I (iii), (iv), (v) (vii) II (i), (ii), (vi) (vii), (viii)

(b) (i) All appliances can be operated independently.

(ii) All appliances will get the same voltage for operation.

19.i ANS 3 Second village

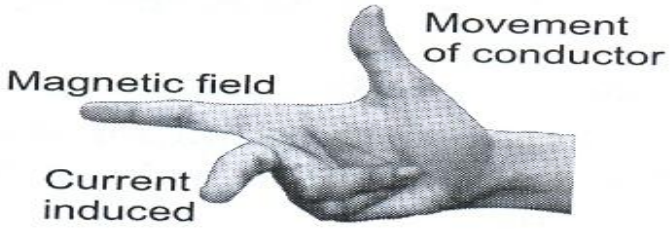
Qualities of Bio gas fuel.

Associated Value :The learners will appreciate the practice of adopting renewable sources of energy like CNG, Biofuel, solar energy by the people.

20. (a) Fig. (b) Plasma and blood cells

(c) (i) Transport oxygen and carbon dioxide (ii) Carry nutrients and other ions for transport

21.(a)Fleming's Right hand rule : It states that if we stretch , forefinger and middle of our right hand such that they are mutually perpendicular to each other. If forefinger direction of magnetic field and the thumb shows the direction of motion of conductor , the middle will show the direction of induced current.



(b) (i) when bar magnet is pushed into the coil, due to the electromagnetic induction and induced current is produced the galvanometer will show deflection in a particular direction.

(ii)When the bar magnet is withdrawn from the coil, the deflection of galvanometer is in opposite direction. It indicates that the current is produced in opposite direction.

(iii) No deflection. Since there is no change in magnetic flux.

(c) 9

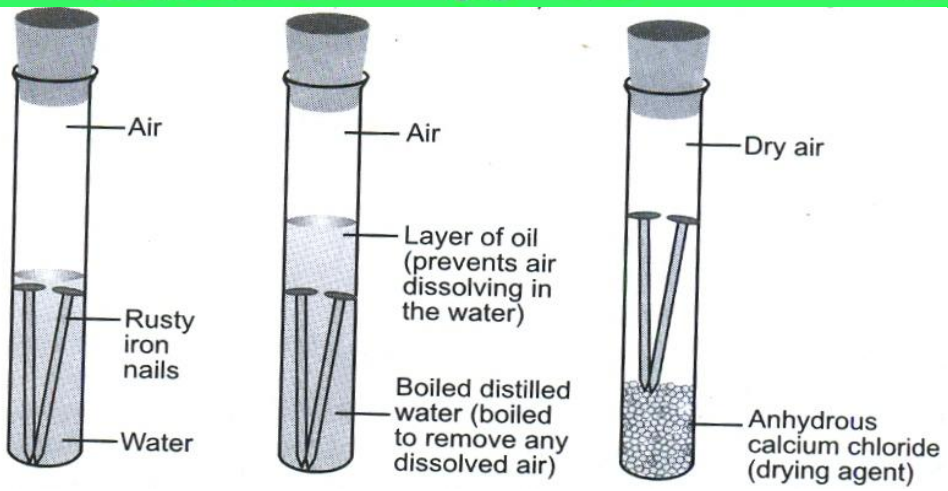
(i) The rate of change of magnetic flux associated with the coil.

(ii) The number of turns in the coil.

22. (i) Iron oxide forms its oxide by reacting with oxygen in air.

Activity:

(a) Take three test tubes and place 2-3 clean iron nails in each of them.
(b) (b) Label these test tubes as A, B and c.
(c) Pour some water in test tube aA and cork it.
(d) Pour boiled distilled water in test tube b. Then, puor about I ml oil and cork it. The oil will float on water and prevent the air from entering.
(e) Put some anhydrous calcium chloride in test tube C and cork it. Anhydrus calcium chloride will absorb moisture, if any, from the air.
(f) Leave the test tube and observe.



You will observe that nails rust in test tube A, but hey do not rust in test tubes B and C. In test tube A, the nails are exposed to only water. In test tube B, the nails are exposed to only water, whereas in test tube C, the nails are exposed to only dry air. This shoes that both air and water are necessary for iron to rust.

Iron + Oxygen + Water $\longrightarrow$ Hydrated iron oxide(Rust)

(ii)Rusting of iron can be prevented by painting the surface of iron object. Oxygen and moisture of the atmosphere will not be able to come in direct contact with the sufasce of iron.

23. Auxin diffuses to other part which is away from the support.

Part of the tendril in contact away from the support does not grow rapidly.

Pat of the tendril away from the support grow rapidly and cause the tendril to grow around the support.

(b) Chemotropism – Movement in plant due to chemicals as stimulus.

Eg.Growth of pollen tube towards ovules.

24. (a)Baking soda is $NaHCO_3$.

$NaCl + H_2O + CO_2 + NH_3 \longrightarrow NH_4Cl + NaHCO_3$

Used in fire extinguishers / prepration of baing soda/as a antacid in medicine.

(b)(i) (1) Formic acid /Methnoic acid

(2) Citric acid

(3)Lactic acid

(4)Oxalic acid

SECTION – B

Answers: Multiple choice questions

25. (d) 26. (d) 27. (b) 28. (a) 29. (d) 30. (b) 31. (b) 32. (c) 33. (b) 34. (c) 35. (b) 36. (d) 37. (c) 38.(b) 39. (d) 40. (b) 41. (b) 42. (d)