SAMPLE PAPER September 2014 (SA-I)-03

Subject- Science

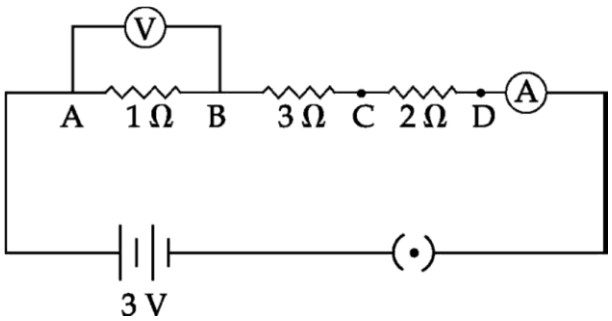
Time: - 3Hrs. Class –X Maximum Marks 90

SECTION-A

1. What happens when ZnCO3 is heated in the absence of air? Give the relevant equation.
2. Which gas is usually liberated when an acid reacts with a metal ?
3. Thermal power plants are setup near coal or oil fields. Give reason.
4. Why do we use copper and Aluminium wire for transmission of electric current ?Why not iron?
5. Write chemical equations for the reactions taking place when

(i) zinc sulphide is heated in air (ii) calcination of zinc carbonate is done.

6. Write observation with reaction for the following : Granulated zinc reacts with dil. sulphuric acid.
7. “Respiration is an exothermic reaction.” Justify this statement giving the chemical equation for the reaction involved.
8. The colour of copper sulphate solution changes when an iron nail is dipped in it. State the giving chemical equation for the reaction involved.Write the name of reaction involved.
9. Which is the internal energy reserve in plants? Do the animals have the same energy reserve ? Justify your answer.
10. Differentiate between renewable and non-renewable sources of energy with one example for each.
11. Resistances of three resistors are given as R1 = 10 Ω, R2 =20 Ω and R3 =30 Ω. Calculate the effective resistance when they are connected in series. Also calculate the current flowing when the combination is connected to a 6V battery
12. A student performs an experiment to study the magnetic effect of current around a current carrying straight conductor with the help of a magnetic compass. He reports that (i) the degree of deflection of the magnetic compass increases when the compass is moved away from the conductor. (ii) the degree of deflection of the magnetic compass increases when the current through the conductor is increased. Which of the above observations of the student appears to be wrong and why ?
13. How would the reading of voltmeter (V) change if it is connected between C and D ? Justify your answer.



14 (a) Identify the substance oxidized, substance reduced, oxidizing agent and reducing agent in (b) the following reaction : $ZnO + C \rightarrow Zn + CO$

(b) Packets of potato chips are flushed with nitrogen gas, why ?

15. A blue colour salt becomes white on heating. Give reason for the above observation. What happens when we add water to the salt which is obtained after heating ? Also write its formula.

16. (a) How does baking soda help to make cakes and bread soft and spongy?

(b) List the raw materials used for the preparation of baking soda.

(c) Write chemical equation for its preparation.

17. (a) Which hormone is responsible for the changes noticed in males at puberty ?

(b) Deficiency of which hormone leads to dwarfism.

(c) Name the hormone which is injected to a diabetic patient.

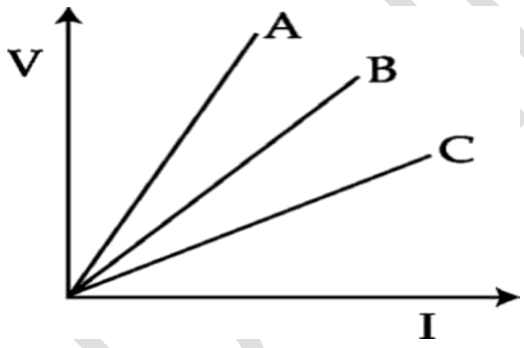
18. (a) What is reflex arc ? (b) How do muscle cells move ?

19. Draw a neat diagram of a biogas plant and label (i) inlet of slurry, (ii) digester and (iii) gas outlet.

20. (a) A student performs an experiment with 4 cells and a resistance wire and an ammeter in series and observes that when the number of cells in the circuit is decreased, the value of current through the wire also decreases. Name the law that is involved in the experiment and write its mathematical form.

V–I graph for two resistors R1, R2 and their series combination are shown in the figure below. Which graph represents the series combination of the other two? Give reason.

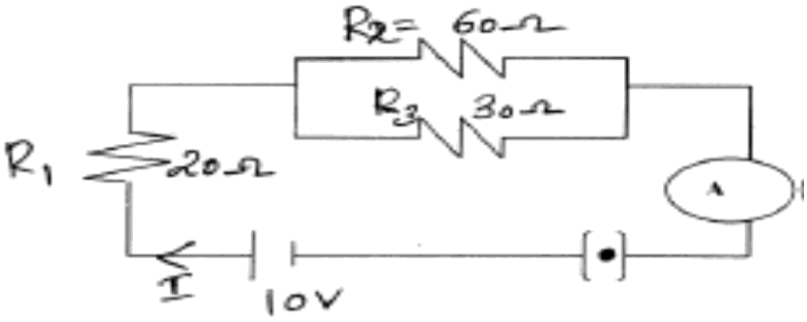
(b)Write difference between ammeter and voltmeter.



OR

For the circuit shown in the diagram calculate.

(a) The total effective resistance of the circuit (b) the total current in the circuit (c) The value of current through 20Ω resistor.



21. (a) Name the metal which is low in activity series and exists as liquid at room temperature. (b) Write the name and formula of its ore.

(c) How is the metal extracted from this ore ?

(d) Write the chemical equation for the reaction involved.

OR

(i) What causes rusting of iron ? Design an activity to show the conditions needed for iron nails to rust.

(ii) Why do we paint iron articles ?

22. (a) Draw a neat diagram of excretory system of human beings and label the following :

(i) Kidney (ii) Ureter (iii) Urinary Bladder (iv) Urethra

(b) How is urine produced.

(c) Name two excretory products other than O_2 and CO_2 in plants.

OR

(a) Draw diagram to show the nutrition in amoeba and label the part used for this purpose. Mention any other purpose served by this part other than nutrition.

(b)Name the glands associated with digestion of starch in human digestive tract and mention their role.

(c) (a) How is required pH maintained in the stomach and small intestine

23. A coil of insulated copper wire is connected to a galvanometer. What will happen if a bar magnet is :

(i) Pushed into the coil with its north pole entering first ?

(ii) withdrawn from inside the coil ?

(iii) Held stationary inside the coil?

(b) Name the above phenomenon and mention the name of the scientist who discovered it. State the law that relates the direction of current in the coil with the direction of motion of the magnet.

OR

Consider a circular loop of wire lying in the plane of the paper. Let the current pass through the loop clockwise. With the help of a diagram explain how the direction of the magnetic field can be determined inside and outside the loop.

(a) Name the law used to find the direction of magnetic field.

(b) Draw a diagram to represent a uniform magnetic field in a given region.

(c) List two properties of magnetic field lines.

24. (a) Name the enzyme present in saliva. Why is it important ?

(b) What is emulsification?

(c) Name the substance that is oxidized in the body during respiration.

(d) Why are lungs divided into very small sac-like structures ?

OR

(a) Draw a neat diagram of human respiratory system and label the parts and label 9 parts in it. (b) What are the end products of digestion of fat and protein in human beings ?

SECTION-B

25. A student was observing a pH chart. He observed that the two colours at the extreme ends of the pH chart are:

(a) Red and green (b) red and blue

(c) green and blue (d) orange and green pH

26. When a drop of an unknown solution X is placed on a strip of pH paper, a deep blue colour is produced. This solution should be –

(a) NaOH (b) Lemon luice

(c) Water (d) HCl

27. On adding dilute hydrochloric acid to granulated zinc placed in a test tube, a student would observe that :

(a) The surface of the metal turns shining. (b) the reaction mixture turns milky.

(c) The reaction mixture gives odour of chlorine.

(d) A colourless and odourless gas evolves with bubbles.

28. When sodium sulphate solution and barium chloride solution are mixed together, the colour of precipitate formed is :

(a) Yellow (b) Green

(c) White (d) Red

29. While doing an experiment a student observed that the blue colour of the aqueous copper sulphate solution was changed to pale green by immersing a metal rod in it. The metal of the rod used by the student is :

(a) iron (b) zinc

(c) silver (d) aluminium

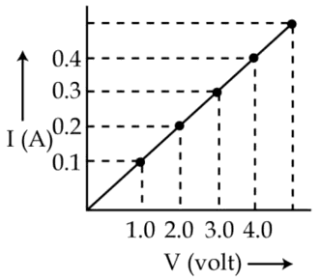
30. Which of the following is the correct method to connect the ammeter and volt meter with resistance in the circuit to verify the Ohm's law?

(a) ammeter and the voltmeter in series (b) ammeter in series and voltmeter in parallel

(c) ammeter but no voltmeter (d) voltmeter and ammeter in parallel

31. In the experiment to study the dependence of current on potential difference across a resistor, a student obtained a graph as shown in the diagram. The value of resistance of the resistor is :

(a) 0.1 Ω (b) 1.0 Ω (c) 10 Ω (d) 100 Ω



32. While studying relation between V and I it is suggested that ammeter should always be connected

(a) parallel to conducter (b) series in the circuit

(C) either in parallel or in series (d) neither a nor b

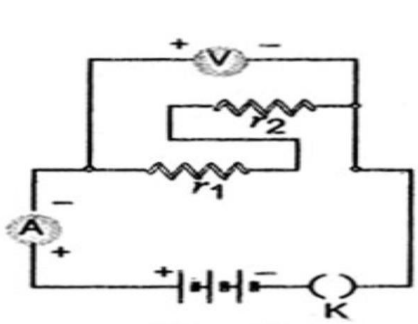
33 A leaf is boiled in alcohol before using iodine for starch test in order to

(a) Dissolve starch. (b) dissolve chlorophyll

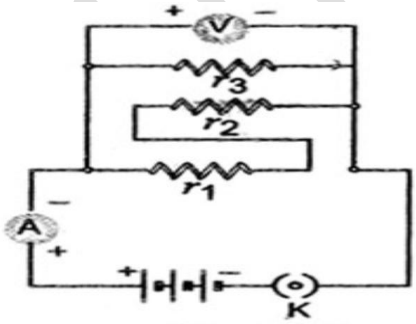
(c) softening the leave (d) to kill the enzymes

34. Study the two circuits circuit I and circuit II shown below. In circuit I, ammeter reads current I1 and voltmeter reads voltage V1. In circuit II, ammeter reads current I2 and voltmeter reads voltage V2. Which one of the following is the correct statement about the ammeter and voltmeter readings ?

(a) I1>I2;V1=V2 (b) I1<I2;V1=V2 (c) I1>I2;V1>V2 (d) I1<I2;V1<V2



Circuit I



Circuit II

35. To make the plant free of starch, it is kept :

(a) in darkness for 72 hours. (b) in a room, but with lights on at night only.

(c) Under the shade of a tree. (d) covered with coloured polythene in a shady place.

36. During the experiment to show that plants do photosynthesis, the destarched leaf is boiled in alcohol. Once boiling is completed,

(a) alcohol remains colourless (b) leaf remains greenish

(c) alcohol turns greenish and leaf becomes colourless (d) no visible change occur

37. While preparing a temporary stained mount of a leaf epidermal peel, the extra stain is removed by :

(a) washing with water (b) washing with calcium chloride

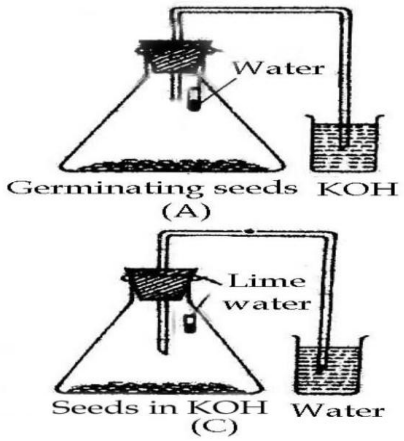
(c) soaking with filter paper (d) absorbing with cotton wool

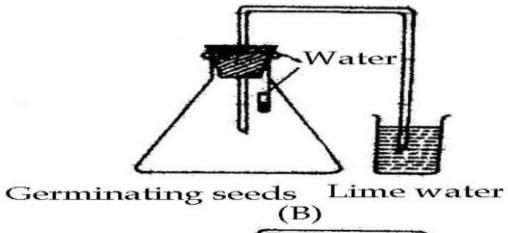
38. A student focused the leaf epidermal peel under a low power microscope, but he could not see all the parts. He should :

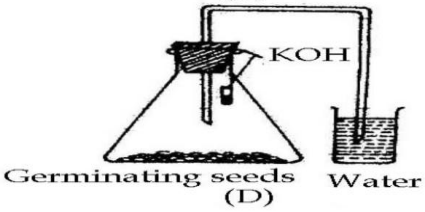
(a) use the coarse adjustment knob again to focus the slide (b) use the fine adjustment knob to increase magnification (c) focus under high power using coarse adjustment knob (d) focus under high power using fine adjustment knob

39. After performing the experiment to show that germinating seeds give out carbon dioxide during respiration, students drew the following labelled diagrams.

The correct labeled diagram is (a) A (b) B (c) C (d) D







40. Before setting up an experiment to show that seeds release CO2 during respiration, the seeds should be :

(a) Dried completely. (b) Boiled to make them soft.

(c) Soaked in vinegar. (d) kept moist till they germinate.

41-An iron nail is placed in solution of copper sulphate.The nail is taken out after 10 minutes.The nail will be found to be covered with

(a)brown deposit (b)black deposit (c) white deposit (d) grey deposit

42- An ammeter has a range of (0-3) ampere and there are 30 division on its scale. What is its least count

(a)1.0 A (b)0.5 A (c) 0.1 A (d) 0.01 A

MODEL ANSWERS SAMPLE PAPER September 2014 (SA-I)-03

1. ZnO (s) and CO_2 (g) are formed.

$ZnCO_3 \rightarrow ZnO + CO_2$

2. Hydrogen gas

3. Transmitting electricity is more efficient and economical than transporting coal or petroleum over same distance.

4. These have Low resistivity and good conductor of electricity. As iron has high resistivity.

5. $2ZnS + 3O_2 \xrightarrow{\text{Roasting}} 2ZnO + 2SO_2$

$ZnCO_3 \xrightarrow{} ZnO + CO_2$

6. Bubbles are seen to come out.

$Zn + \text{dil } H_2SO_4 \rightarrow ZnSO_4 + H_2$

7. During respiration, the carbohydrates are broken down to form glucose. This glucose combine with oxygen in our cells and provides energy (heat).

$C_6H_{12}O_6 + 6O_2 + 6H_2O \rightarrow 6CO_2 + 12H_2O + \text{Energy}$.

8. $CuSO_4$ (Blue) + Fe $\rightarrow\rightarrow$ $FeSO_4$ (Green) + Cu

Iron is more active than copper. Hence it displaces copper from copper sulphate and due to formation of FeSO4, the colour changes from blue to green. Displacement reaction.

9. Plants have starch as the storage of carbohydrate which acts as internal energy reserve.

Yes. Animals have glycogen as internal energy reserve.

10. Energy sources that can be regenerated are called renewable sources of energy.

Eg : Solar energy.

Energy sources that will get depleted someday are called nonrenewable sources of energy. Eg : Fossil fuels

11. $R = R1 + R2 + R3 = 10 + 20 + 30 = 60\Omega$ $I = V/R = 6/60 = 1/10 = 0.1$ A

12. The first observation is wrong. Because as the distance from the conductor increases, the strength of the magnetic field will decrease. So the degree of deflection of the compass should decrease instead of increasing.

13. $R = R1+R2+R3 = 1+2+3 = 6$

$V = IR$

$I = 3/6 = ½ = 0.5$

Voltage across $1\Omega = V = IR = ½ = 0.5$V 1

Voltage across $2\ \Omega$ $V = IR = ½ \times 2 = 1$V

14. (a) C is oxidized, ZnO is reduced (b)C reducing agent, ZnO oxidizing agent

To slow down oxidation by creating an inert atmosphere

15. It becomes white due to loss of water of crystallization. It regains its blue colour on adding water to it.

Its formula is $CuSO_4.5H_2O$

16.(a) On heating baking soda carbon dioxide gas is released that makes the cake soft and spongy.

(b)Ammonia, Sodium chloride and carbon dioxide.

(c) $NaCl + NH_3 + CO_2 + H_2O \rightarrow NH_4Cl + NaHCO_3$

17. (a) Testosterone. (b) Growth hormone (c) . Insulin.

18 (a) The process of detecting the signal or the input and responding to it by an output action might be completed quickly. Such a connection is commonly called reflex arc.

(b) Muscle cells have special proteins that change their shape and arrangement in the cell in response to electrical impulse. This leads the muscle cells shorten.

19. Bio Gas Plant

Diagram as given on page no. 247 of NCERT

20. Ohm's law

V/I =Constant or V/I = R

A represents the series combination of B and C. Because in series resistance becomes greater. Since slope of A is greater than B and C, resistance of A is greater than B and C.

Voltmeter measures potential difference and ammeter measures current.

OR

.Effective resistance R = R2 x R3 / (R2 + R3) = (60 x 30 / 90) = 20 Ω

Total effective resistance of the circuit, R = R1 + R2 = 20 + 20 = 40

Current in the circuit, I = V/R = 10V/40 = 0.25A

Since 20 Ohm is in series, current remains the same i.e., 0.25 A

21. (a) Hg (mercury) (b) HgS (Cinnabar)

(c) When cinnabar is heated in air, it first converts into mercuric oxide (HgO) which is reduced to mercury on further heating

(d) $2HgS + 3O_2 \rightarrow 2HgO + 2SO_2$

$2HgO \rightarrow 2Hg + O_2$

OR

(i) Iron forms its oxide by reacting with oxygen in air. (ii) activity - Conditions needed for iron nails to rust"

Take three test tubes and place clean iron nails in each of them.

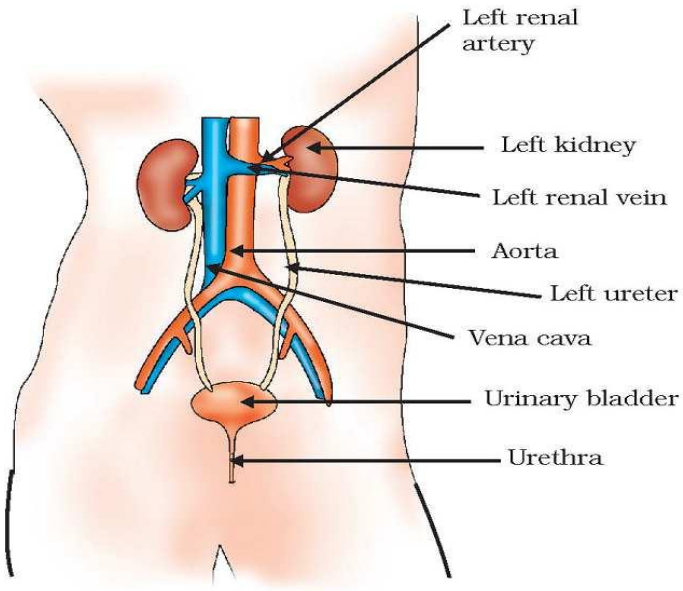
Label these test tubes A, B and C. Pour some water in test tube A and cork it.

Pour boiled distilled water in test tube B, add about 1mL of oil and cork it. The oil will float on water and prevent the air from dissolving in the water.

Put some anhydrous calcium chloride in test tube C and cork it. Anhydrous calcium chloride will absorb the moisture, if any, from the air. Leave these test tubes for a few days and then observe.

(iii) 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 surface of iron.

22. (a) Excretory system in human beings

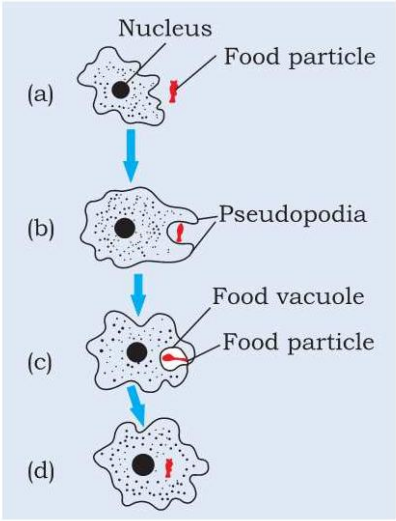


(b) Each kidney has large numbers of filtration units called nephrons packed close together. Some substances in the initial filtrate, such as glucose, amino acids, salts and a major amount of water, are selectively reabsorbed, leaving the urine as waste.

(c) water, resins, gums

OR

(a) Nutrition in Amoeba



Pseudopodia help in locomotion.

(b) salivary glands - salivary amylase - break starch into sugar

pancreas - pancreatic amylase (juice) - digest starch

intestinal glands - intestinal amylase - digest starch

(c) acidic pH in stomach - due to hydrochloric acid secreted by stomach & alkaline pH in small intestine - due to bile (liver)/pancreatic juice (pancreas)

23.(a) (i) A momentary deflection - indicates momentary current-direction of current in the coil - anticlockwise

(ii) Deflection in opposite direction - current of an opposite direction

(b) (iii) No deflection - no current is produced in the coil

Electromagnetic Induction ; Faraday,

Fleming's right hand rule : Stretch the thumb, forefinger and middle finger of right hand so that they are perpendicular to each other, as shown in. If the forefinger indicates the direction of the magnetic field and the thumb shows the direction of motion of conductor, then the middle finger will show the direction of induced current.

OR

(a) Direction of field inside the loop is perpendicular to the plane of paper pointing inward. Outside the loop in opposite direction. Direction of current

(b)Law - Right hand thumb rule or Maxwells cork screw rule

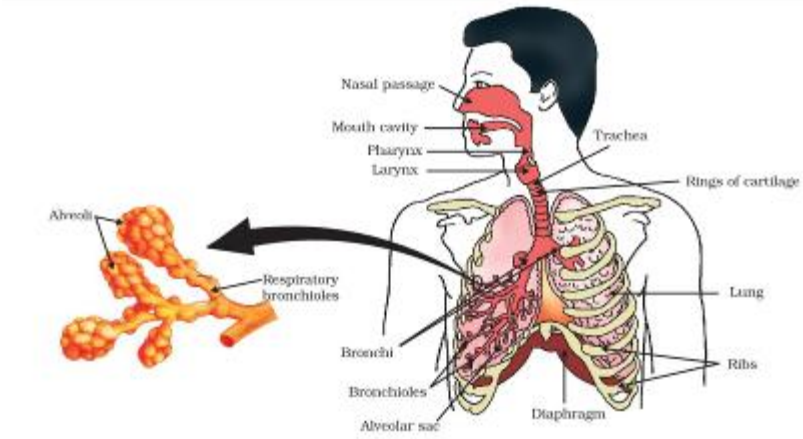
(c) 1-Magnetic field lines never intersect each other and are crowded near the poles

(d)To increase the surface area for exchange of gases

24.(a) Salivary amylase -- Breaks down starch to give sugar

(b) break down of large fat globules to smaller globules – emulsification (c) Glucose

OR Human respiratory system



(b) Fat : fatty acid + glycerol Protein : amino acids

SECTION –B

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