ELEVATE
learning for life

CLASS
10

MOCK PAPER

SCIENCE [SA1]

Time : 3 Hrs. *MM : 90*

GENERAL INSTRUCTIONS

I. *Question paper comprises of two sections, A and B. You are to attempt both the sections.*
II. *All questions are compulsory.*
III. *All questions of section A and all questions of section B are to be attempted separately.*
IV. *Question numbers 1 to 3 in section A are one mark each, to be answered in one word or one sentence.*
V. *Question numbers 4 to 7 are two marks each, to be answered in about 30 words.*
VI. *Question numbers 8 to 19 are three marks each, to be answered in about 50 words.*
VII. *Question numbers 20 to 24 are five marks each, to be answered in about 70 words.*
VIII. *Question numbers 25 to 42 in section B are MCQ based on practical skills. Each question is a one mark question.*

SECTION – A

1. Why is photosynthesis considered as an endothermic reaction ?

2. A carbon resistor of 74 k Ω is to be marked with rings of different colours for its identification. Write the sequence of colours.

3. What is reflex action ?

4. What are the limitations of the energy that can be obtained from the oceans?

5. Give five characteristics of a good fuel?

6. Explain why, the galvanised iron article is protected against rusting even if the zinc layer is broken.

7. What is 24 carat gold ? How will you convert it into 18 carat gold ?

8. The heat produced on complete combustion of 10 g of a fuel could raise the temperature of 2 kg of water from 20°C to 70°C. Calculate the calorific value of the fuel, if the specific heat capacity of water 4.2 J/g°C. Assume that the heat taken by the calorimeter is negligible.

9. A metallic conductor is suspended perpendicular to the magnetic field of a horse-shoe magnet. The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the
(a) current flowing through it is increased?
(b) horse-shoe magnet is replaced by another stronger horse-shoe magnet?
(c) direction of current through it is reversed?

10. (a) What is a decomposition reaction ? Give one example.
(b) What type of reaction will occur when silver chloride is exposed to sunlight?
(c) Identify the type of the reaction, when lead (II) nitrate solution is mixed with potassium iodide solution.

11. Explain different ways to induce electric current in a given coil. How can the magnitude of the induced current be increased?

12. Mrs. Sharma went to the jewellers to buy gold jewellery. She asked the jeweller if the jewellery is made of pure gold. The jeweller assured her

that it is 100% gold and nothing has been mixed in it. Mrs. Sharma was happy and bought the necklace.

Answer the following questions based on the above information:

(a) Was the jeweller right in saying that the necklace is made of 100% gold?

(b) What values are promoted by the jeweller?

(c) What precautions should you take while purchasing gold jewellery?

13. (a) What are redox reactions?

(b) Why is the reaction between manganese dioxide and hydrochloric acid called a redox reaction?

(c) Identify the oxidising agent and the reducing agent in the above reaction.

14. A gas is produced when conc. H_2SO_4 is added to solid sodium chloride solution taken in a test tube. The gas coming out through the delivery tube is passed over a dry blue litmus paper and then over a moist blue litmus paper. What would you observe? Give reason for your observation and write the corresponding balanced chemical equation.

15. Three incandescent bulbs of 100 W–220V each are connected in series in an electrical circuit. In another circuit another set of three bulbs of the same voltage are connected in parallel to the same source.

(a) Will the bulb in the two circuits glow with the same brightness? Justify your answer.

(b) Now let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit? Give reason.

16. (a) The potential difference between two points in an electric circuit is 1 volt? What does it mean? Name a device that helps to measure the potential difference across a conductor.

(b) Why does the connecting cord of an electric heater not glow while the heating element does?

(c) Electrical resistivities of some substances at 20°C are given below:

Silver	$1.60 \times 10^{-8}\ \Omega$
Copper	$1.62 \times 10^{-8}\ \Omega$
Tungsten	$5.2 \times 10^{-8}\ \Omega$
Iron	$10.0 \times 10^{-8}\ \Omega$
Mercury	$94.0 \times 10^{-8}\ \Omega$
Nichrome	$100 \times 10^{-6}\ \Omega$

Answer the following questions using above data:

(i) Among silver and copper, which one is a better conductor? Why

(ii) Which material would you advise to be used in electrical heating devices and why?

17. Which animal or plant hormone is associated with the following?

(i) Increased sugar level in blood

(ii) Changes at puberty in boys

(iii) Inhibits growth of plants

(iv) Rapid development of fruits

(v) Dwarfism

(vi) Goitre

18. (a) Draw a diagram depicting human alimentary canal and label on it: Gall bladder, Liver, Pancreas,

(b) State the roles of liver and pancreas.

(c) Name the organ which performs the following functions in humans:

(i) Absorption of digested food

(ii) Absorption of water.

19. (a) Explain 'reflex action' with a suitable example.

(b) What happens at the synapse between the neurons?

20. (a) Name an instrument that measures electric current in a circuit. Define the unit of electric current.

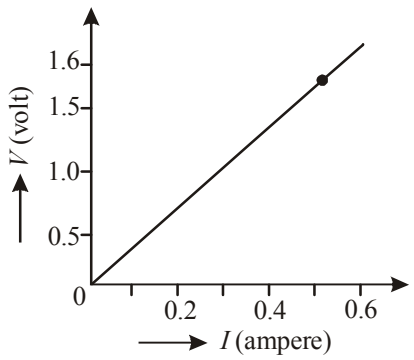
(b) What do the following symbols represent in a circuit diagram?

(i)  (ii) 

(c) An electric circuit consisting of a 0.5 m long nichrome wire XYm, an ammeter, a voltmeter, four cells of 1.5 V each and a plug key was set up.

(i) Draw the electric circuit diagram to study the relation between the potential difference maintained between the points 'X' and 'Y' and the electric current flowing through XY.

(ii) Following graph was plotted between V and I values using above circuit:



What would be the values of $\frac{V}{I}$ ratios when the potential difference is 0.8 V, 1.2 V and 1.6 V, respectively? What conclusion do you draw from these values?

Or

(a) What do you understand by earthing?

(b) What are the advantages of earthing in a household electric circuit?

(c) Explain how it is done.

21. Answer the following questions :

(a) What is the direction of magnetic field lines outside a bar-magnet?

(b) Why two magnetic field lines cannot intersect each other ?

(c) The magnetic field lines in a given region are getting crowded. What does it indicate?

(d) What is the frequency of A.C. in India?

(e) State one advantage of A.C. over D.C.

Or

What is the nature of magnetic field produced by a straight current carrying conductor? Explain with the help of an experiment.

22. (a) Give reasons for the following :

(i) Metals are regarded as electropositive elements.

(ii) Articles made of Aluminium do not corrode even though aluminium is an active metal.

(b) State the reason for the following behaviour of zinc metal :

On placing a piece of zinc metal in a solution of mercuric chloride it acquires a shining silvery surface but when it is placed in a solution of magnesium sulphate no change is observed.

Or

(a) When a metal *X* is treated with cold water, it gives a basic salt *Y* with molecular formula XOH (Molecular mass = 40) and liberates a gas Z which easily catches fire. Identify X, Y and Z and also write the reaction involved.

(b) Which two metals do not corrode easily? Give an example in each case to support that

(i) corrosion of some metals is an advantage.

(ii) corrosion of some metals is a serious problem.

23. (a) Name the properties responsible for the following uses of baking powder.

(i) Baking industry

(ii) As an antacid

(iii) As soda-acid fire extinguisher

(b) Acid when react with metals release hydrogen gas but there is one acid which when reacts with metals and does not release hydrogen except for two metals. Prove this statement.

Or

(a) What do you mean by the family of salts?

(b) Why do HCl, HNO_3, etc., show acidic characters in aqueous solutions while solutions of compounds like alcohol and glucose do not show acidic character ?

(c) A weak acid is added to a concentrated solution of hydrochloric acid. Does the solution become more or less acidic ?

24. (a) What is meant by breathing? What happens to rate of breathing during vigorous exercise and why?

(b) Define translocation with respect to transport in plants. Why is it essential for plants? Where in plants are the following synthesized (i) Sugar (ii) Hormone?

Or

(a) Explain the role of the following in the process of digestion in the human body ?

(i) Saliva (ii) Gastric juices

(b) Why does absorption of digested food occur mainly in the small intestine ?

SECTION – B

25. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

(a) Lemon juice (b) Vinegar

(c) Common salt (d) An antacid

26. In an experiment to prepare a compound using iron filings and sulphur powder, the teacher instructed the students not to heat the mixture of iron and sulphur without test-tube holder because :

(a) the reaction between iron and sulphur is exothermic

(b) the reaction between iron and sulphur is endothermic

(c) the test-tube is likely to melt

(d) the reaction is explosive

27. Solid sodium bicarbonate was placed on a strip of pH paper. What change will be observed in the colour of the strip?

(a) It turns blue

(b) No change

(c) It turns green

(d) It turns light pink

28. A pH paper is first dipped in distilled water and then in the dilute solution of lemon juice. The colour of pH paper changes from

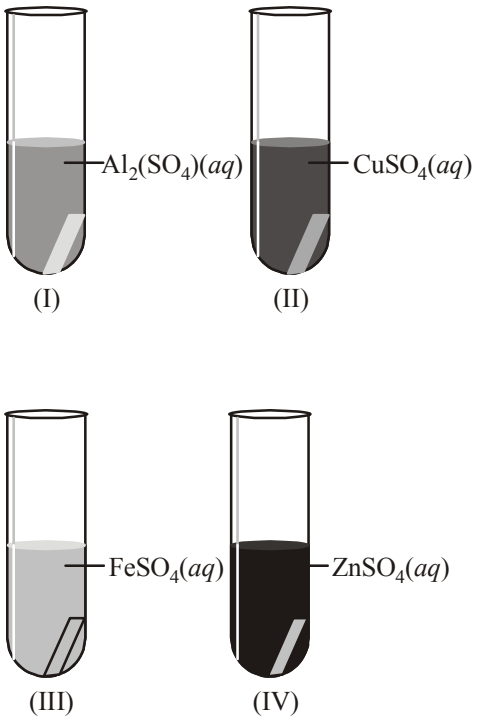
(a) indigo to green

(b) indigo to orange.

(c) green to blue

(d) green to orange.

29. A student took four test tubes I, II, III and IV containing aluminium sulphate, copper sulphate, ferrous sulphate and zinc sulphate solution, respectively. He placed an iron strip in each of them. He found a brown deposit formed in which test tube?



(a) I (b) II

(c) III (d) IV

30. A blue litmus paper was first dipped in dil. HCl and then in dil. NaOH solution. It was observed that colour of the litmus paper

(a) changed to red

(b) changed first to red and then to blue

(c) changed blue to colourless

(d) remains blue in both the solutions

31. By increasing the temperature, the specific resistance of a conductor and a semiconductor

(a) Increases for both

(b) Decreases for both

(c) Increases, decreases

(d) Decreases, increases

32. A student connects a circuit to study Ohm's law using a resistor 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?

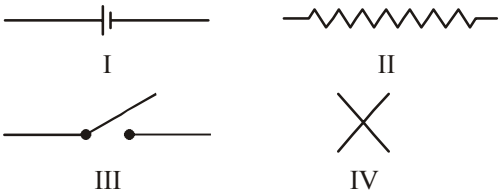
(a) 0 – 200 mA (b) 0 – 100 mA

(c) 0 – 1 A (d) 0 – 2 A

33. An ammeter can read current upto 5A and it has 20 divisions between mark 0 and mark 2 on its scale. The least count of the ammeter is:
(a) 0.02 A (b) 0.01 A
(c) 0.2 A (d) 0.1 A

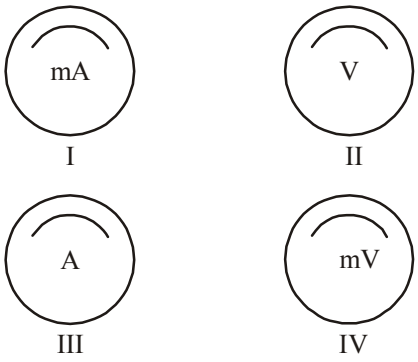
34. The electric appliances in domestic lines are connected in:
(a) Series
(b) Parallel
(c) Sometimes in series and sometimes in parallel
(d) Nothing is related to the type of combination.

35. Which of the following symbols is used to denote key in an electrical circuit diagram?

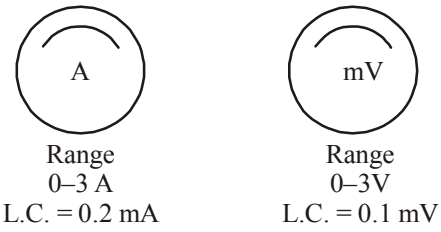


(a) III (b) II
(c) IV (d) I

36. Four different measuring instruments are shown below. Out of these, the instrument that can be used for measuring current is/are the instruments labeled as:



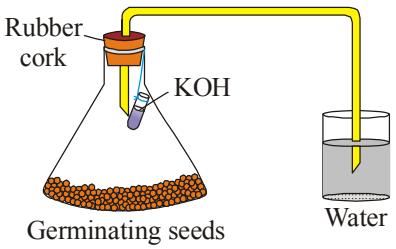
(a) I and III with I more reliable of the two
(b) I and IV with IV more reliable of the two
(c) II and III with II more reliable of the two
(d) II and IV with IV more reliable of the two.



37. A student was asked to focus a permanent slide under high power of microscope. This involved the following steps which have not been written in a correct sequence:
(i) Place the slide on the stage.
(ii) Clean the microscope and lenses
(iii) Focus the material with the help of coarse adjustment
(iv) Place the lower power objective above the slide
(v) Sharpen the focus with fine adjustment
(vi) Bring high power objective lens over the slide.
(a) i, ii, iii, iv, v, vi
(b) ii, i, iii, iv, v, vi
(c) i, ii, vi, iii, iv, v
(d) ii, i, iv, iii, vi, v.

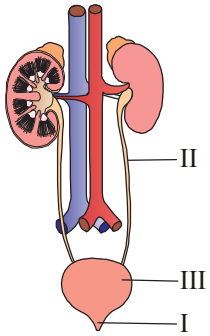
38. Before setting an experiment on Photosynthesis, a healthy potted plant is kept in a dark room for 24 hours to
(a) Denature enzymes
(b) Activate chloroplasts
(c) Destarch leaves
(d) Increased intake of carbon dioxide.

39. The germinating seeds present in experimental set up



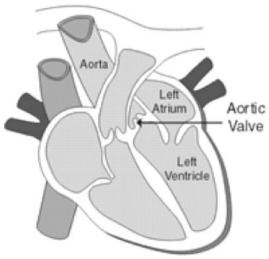
(a) Take up oxygen from water
(b) Take up CO_2 from the atmosphere
(c) Release O_2 into the air
(d) Release CO_2 into the air in the flask.

40. Which is the correct order for the path taken by urine after it leaves the kidney?



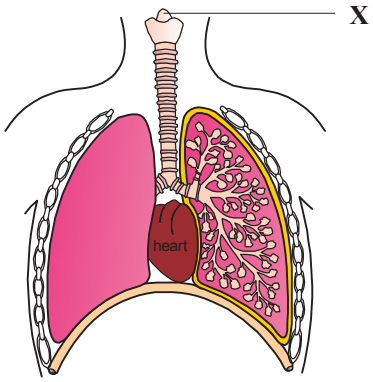
(a) I → II → III
(b) III → I → II
(c) II → III → I
(d) II→ I → III

41. A blockage in aortic valve would directly reduce blood flow to the _____.



(a) Heart
(b) Liver
(c) Lungs
(d) Brain

42. The given diagram represents human respiratory system.



What is the function of label X?

(a) To prevent food from entering into trachea.
(b) To filter and warm the air.
(c) To help in exchange of gases.
(d) To catch dust and bacteria.

HINTS & SOLUTIONS

SECTION – A

1. Photosynthesis is an endothermic reaction. This is because light energy in the form of sun light is absorbed during the process of photosynthesis by green plants. **(1 mark)**

2. $74\ k\Omega = 74 \times 10^3\ \Omega$. Voilet, yellow and orange. **(1 mark)**

3. Reflex action is an automatic, spontaneous nerve mediated response to a stimulus without consulting the will of the individual. **(1 mark)**

4. The energy from the ocean can be obtained mainly in three forms- (i) tidal energy (ii) wave energy and ocean thermal energy. But these energy can't be a potential source of energy in future because of the following reasons –
(i) there are very few places around the world which are suitable for building tidal dams.
(ii) the rise and fall of sea-water during high and low tides is not enough to generate electricity on a large scale. **(2 marks)**

5. Characteristics of a good fuel :
(i) High calorific value.
(ii) Moderate rate of combustion.
(iii) Should produce less smoke and harmful gases.
(iv) Should not leave residue.
(v) Should be compact and can be stored easily.
(vi) Can be transported easily. **(2 mark)**

6. The galvanised iron article remains protected against rusting even if the zinc layer is broken because zinc is more easily oxidised than iron. So when zinc layer on the surface of galvanised iron article is broken, then zinc continues to corrode but iron article does not corrode or rust. **(2 marks)**

7. 24 carat gold is pure gold. Pure gold is very soft and not suitable for making jewellery. Therefore, to increase its hardness, it is alloyed either with copper or silver. 18 carat gold is prepared by alloying 18 parts pure gold with 6 parts of either copper or silver ionic compound. **(2 marks)**

8. Here, Mass of fuel, $m = 10\ g$
Mass of water, $M = 2\ kg = 2000\ g$
Specific heat capacity of water, $C = 4.2\ J/g°C$
Rise of temperature, $\Delta T = (70 - 20) = 50°C$
Calorific value of the fuel, $c = ?$ (to be calculated)
From relation of calorimetry heat taken by water,
$Q = Mc\,\Delta T$
Putting values, we get, $Q = 2000 \times 4.2 \times 50$
$= 4.2 \times 10^5\ J$
From relation, $Q = mc$
We have, $c = \frac{Q}{m}$; Putting values, we get,
$c = \frac{4.2 \times 10^5}{10} = 4.2 \times 10^4\ J/g$
Calorific value of the fuel, $c = 42\ kJ/g$.
(3 marks)

9. **(a)** Displacement of the conductor will increase. **(1 mark)**
(b) Force acting on a conductor increases with increase in the magnetic field, so displacement of the conductor will increase. **(1 mark)**
(c) The direction of the displacement of the conductor will be opposite to the earlier case. **(1 mark)**

10. **(a)** The conversion of a single compound into two or more simpler substances is called a decomposition reaction. **(1 mark)**
(b) Photochemical decomposition **(1 mark)**
(c) Double displacement **(1 mark)**

11. (i) A current can be induced in a coil when a magnet is moved relative to the fixed coil.
(ii) A current can also be induced in a given coil when it is moved relative to a fixed magnet.
(iii) Current can also be induced in the coil by placing it close to another coil carrying a changing current. **(1½ mark)**

The magnitude of the induced current can be increased by :

(i) Taking the conductor in the form of a coil of many turns of insulated wire.

(ii) Increasing the strength of the magnetic field used.

(iii) Increasing the rate of change of magnetic flux association with the coil. **(1½ mark)**

12. (a) No, he was wrong. Pure gold is very soft and is therefore not suitable for making jewellery. It is alloyed with either silver or copper to make it hard. But sometimes jewellers mix a large quantity of copper and silver in gold to earn more profit. **(1 mark)**

(b) Untrustworthiness, cheating. **(1 mark)**

(c) We should always purchase the gold jewellery from a branded shop with proper receipt and Hallmark certificate. **(1 mark)**

13. (a) Redox reaction is a process in which oxidation and reduction take place simultaneously. **(1 mark)**

(b) Because MnO_2 is reduced to $MnCl_2$ and HCl is oxidised to H_2O **(1 mark)**

(c) Oxidising agent—MnO_2
Reducing agent—HCl **(½ + ½ =1 mark)**

14. HCl gas is produced.

$$2NaCl + H_2SO_4 \longrightarrow Na_2SO_4 + 2HCl$$

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

The gas when passed through moist litmus paper, colour is changed to red as it shows acidic properties. Because H^+ ions are produced when HCl dissolves in water. **(3 marks)**

15. (a) No

Reasons : Let R be the resistence of each bulb, then total resistence in series = 3R

In series, current in each bulb is same.

So current drawn by each bulb connected in series is one-third as compared to the current in each bulb in parallel arrangement, so the bulbs connected in parallel combination glow more brightly. **(1½ marks)**

(b) In series arrangement, if one bulb is fused; then current in the bulbs connected in series will become zero, so bulbs will stop glowing.

In parallel arrangement, if one bulb is fused, the other two bulbs will continue to glow with same brightness. **(1½ mark)**

16. (a) The potential difference between two points is 1 volt means that if a charge of 1 coulomb is moved from one point to the other, 1 joule of work is required.

The potential difference across a conductor is measured by means of an instrument called the "Voltmeter." **(1 mark)**

(b) The electric power P is given by

$$P = I^2R$$

The resistance of the heating element is very high. Large amount of heat generates in the heating element and it glows hot.

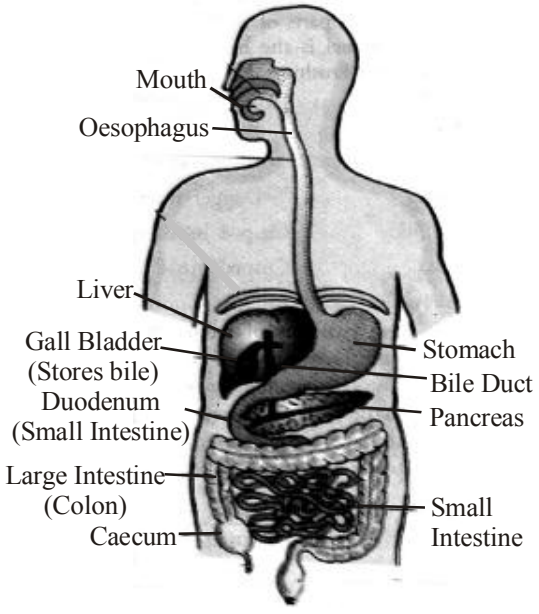
The resistance of connecting cord is very low. Thus, negligible heat generates in the connecting cord and it does not glow. **(1 mark)**

(c) (i) Silver is a better conductor due to its lower resistivity.

(ii) Nichrome should be used in electrical heating devices due to very high resistivity. **(½+½ = 1 mark)**

17. (i) Insulin
(ii) Testosterone
(iii) Abscisic acid
(iv) Auxin
(v) Somatorophic or growth hormone
(vi) Thyroxine **(½×6= 3 marks)**

18. (a) Diagram of human alimentary canal



(1 mark)

(b) (i) **Role of Liver**. Decomposition of haemoglobin, formation and secretion of bile for emulsification of fat. Formation of urea, heparin, fibrinogen and prothrombin. Detoxification of chemicals and elimination of pathogens.

(ii) **Role of Pancreas**. Secretion of pancreatic juice having lipase; trypsin and amylase; secretion of hormones, insulin and glucagon . **(½+½ = 1 mark)**

(c) (i) **Absorption of Digested Food**. Ileum part of small intesine.

(ii) **Absorption of Water**. Large intestine.

(½+½ = 1 mark)

19. (a) Reflex Action is defined as an unconscious, automatic and involuntary response of effectors, *i.e.*, muscles and glands, to a stimulus, which is monitored through the spinal cord. **(1 mark)**

(b) At synapse, axon terminal is expanded to form presynaptic knob. The dendrite terminal that lies close to it is lightly broadened and depressed to form post-synaptic depression. A fluid filled narrow space, called synaptic cleft, occurs between the two. When an impulse reaches the presynaptic knob, it stimulates the release of neurotransmitter into synaptic cleft. Neurotransmitter comes in contact with chemoreceptor sites of the membrane of postsynaptic depression. This generates an electrochemical signal or impulse in the dendrite part of second neuron.

(2 marks)

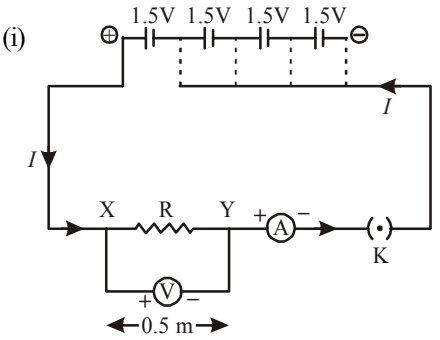
20. (a) An instrument that measures electric current in a circuit is called "ammeter". The unit of electric current is ampere (A). 1 ampere is constituted by the flow of 1 coulomb of charge through any point in an electric circuit in 1 second. **(1½ marks)**

(b) (i) Variable resistance or rheostat

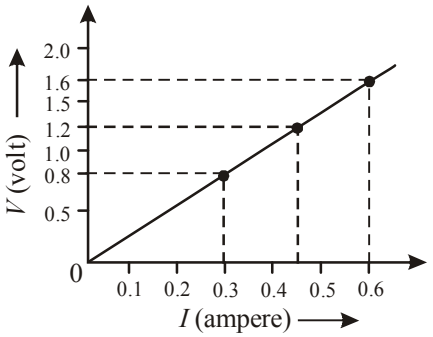
(ii) Plug key or switch (closed)

(½+½ mark)

(c) (i)



(ii) Following graph was plotted between V and I values.



At potential difference 0.8 V,

$$\frac{V}{I} = \frac{0.8}{0.3} = \frac{8}{3} \quad ...(1)$$

At potential difference 1.2 V,

$$\frac{V}{I} = \frac{1.2}{0.45} = \frac{8}{3} \quad ...(2)$$

$$\frac{V}{I} = \frac{1.6}{0.6} = \frac{8}{3} \quad ...(3)$$

Conclusion: If I be the current through XY resistor and V be the potential difference across it, then the ratio $\frac{V}{I}$ = constant.

$\Rightarrow$ V $\propto$ I and Ohm's law is obeyed.

(2½ mark)

Or

(a) By earthing we mean that the metallic body of an electric appliance is connected to thick, copper wire, which is buried deep in the earth and at its end is a copper plate surrounded by a mixture of charcoal and common salt. **(1 mark)**

(b) It is a kind of safety device which saves us from an electric shock, in case when the metal

casing of the appliance happens to touch the live wire or due to short circuiting or leakage of electric current.

Whenever an appliance which is earthed, gets short circuited, the current from the metal casing of the appliance flows into the earth which acts as an electric sink, i.e., its potential always remains zero. Due to the flow of heavy current the fuse in that circuit melts and disconnects the appliance from the circuit. So the user who happens to touch the appliance is protected from receiving any electric shock. Another advantage is that due to overheating the house wiring system is saved from being damaged and same time from being burnt out. **(2 mark)**

(c) A three core, cord having three wires coated with insulation of red, brown and green colour, is used for connecting the appliance to the mains for drawing current from the mains. At one end of the cord, red is connected to the pin marked L (live), the brown to the pin marked N (neutral) and green to thick pin of the plug. The three wires at the other end of the cord are connected to the appliance such that live and neutral wires are connected to the element and the earth wire is connected to the metal body of the appliance so as to earth it. Once the plug is put in the socket, the current through the appliance passes as soon as the switch is pressed. The live wire gets connected to the live wire of the mains. Neutral wire is connected to the neutral of the mains and the earth wire gets connected to the earth in the mains.

(2 marks)

21. (a) North pole to south pole. **(1 mark)**

(b) Because it would mean that at the point of intersection, the compass needle would point towards two directions and magnetic fields will be in two different directions simultaneously which is not possible.

(1 mark)

(c) The strength of magnetic field is higher in this region. **(1 mark)**

(d) 50 Hz. **(1 mark)**

(e) A.C. voltage can be stepped up and transmitted over long distances without much loss of energy. **(1 mark)**

Or

The magnetic field produced around a straight current carrying conductor is in the form of concentric circles with the centre lying on the straight conductor.

Take a copper wire AB. Pass it through a cardboard. Connect the wire to a battery through a key. Sprinkle some iron filings on the cardboard. Switch on the key and tap the cardboard gently. You will find that the iron filings arrange themselves in the form of concentric circles. Reverse the direction of current by changing the polarity of the battery. You will find that this time too, the iron filings arrange themselves in concentric circle but in opposite direction.

Hence, the magnetic field lines of force around a straight conductor carrying electric current are concentric circles with the conductor at the centre. The direction of magnetic field changes if the direction of current is reversed.

(5 marks)

22. (a) (i) It is because metals can lose electrons easily to form positive ions, therefore, regarded as electropositive elements. **(1 mark)**

(ii) It is because oxide layer is formed on the surface of aluminium due to which it does not react further because it is non-penetrating layer. **(1 mark)**

(b) When zinc metal is placed in solution of mercuric chloride, Zn displaces mercury and a shining silvery surface is formed because zinc is more reactive than mercury.

$Zn(s) + HgCl_2(aq) \longrightarrow ZnCl_2(aq) + Hg(l)$

When zinc metal is placed in $MgSO_4$ solution, no reaction takes place because Zn is less reactive than Mg, therefore, it cannot displace Mg from $MgSO_4$.

(3 marks)

Or

(a) X — Na; Y — NaOH; Z — H_2

$2Na + 2H_2O \longrightarrow 2NaOH + H_2 + \text{Heat energy}$

(1+1=2 marks)

(b) Gold and platinum **(1 mark)**

(i) A thin impervious layer of aluminium oxide forms a protective layer which protects the aluminium metals underneath from further damage.

(1 mark)

(ii) Corrosion of iron is a serious problem. Every year enormous amount of money is spent to replace damaged iron and steel structures.

(1 mark)

23. **(a)**

	Properties of baking powder	**Uses**
(i)	On heating releases CO_2 gas	Baking industry
(ii)	Alkaline in nature, neutralises excess acid in stomach	Antacid
(iii)	When it reacts with acid it releases CO_2 gas which can extinguisher extinguish fire.	Soda-acid fire

(1+1+1=3 marks)

(b) Acid + Metal $\longrightarrow$ Salt + Hydrogen

e.g., $2HCl + 2Na \longrightarrow 2NaCl + H_2$

$H_2SO_4 + 2Na \longrightarrow Na_2SO_4 + H_2$

$HNO_3 + Na \longrightarrow$ No hydrogen gas

Nitric acid does not release hydrogen gas when it reacted with metals.

This is because nitric acid is strong oxidising agent

Nitric acid reacts only with magnesium and manganese to evolve hydrogen gas

$Mg + 2HNO_3 \longrightarrow Mg(NO_3)_2 + H_2 \uparrow$

$Mn + 2HNO_3 \longrightarrow Mn(NO_3)_2 + H_2 \uparrow$

(2 marks)

Or

(a) Salts, having the same positive or negative radicals, are said to belong to the same family. **(1 mark)**

(b) It is because HCl and HNO_3 ionise in aqueous solution whereas ethanol and glucose do not ionise in aqueous solution. **(2 marks)**

(c) When a weak acid is added to a concentrated solution of hydrochloric acid, the solution becomes more acidic because it increases the hydronium ion concentration of the solution. **(2 marks)**

24. **(a)** Breathing is a physical process of inhalation or bringing in fresh air for obtaining oxygen and exhalation or taking out of foul air for elimination of carbon dioxide. Breathing becomes rapid during vigorous exercise because of the requirement of large amount of oxygen. It is used in providing higher amounts of energy. **(1+1=2 marks)**

(b) Translocation is the movement of food in solution form inside phloem part of plants from the region of source (manufacture or storage) to the area of sink (use or storage). All plant parts require food for growth, development and respiration. However, food is manufactured in only green cells exposed to sunlight. Therefore, manufactured food is translocated to all non-green parts and their cells.

(i) **Sugar.** It is synthesised in chlorenchyma or green cells as of leaves.

(ii) **Hormones.** They are mostly manufactured in tips of roots and stems. **(1+1+1=3 marks)**

Or

(a) The role of the following in the process of digestion in the human body are as follows :

(i) **Saliva.** The food gets mixed up with the saliva of the mouth secreted by salivary glands. Saliva contains an enzyme **ptyalin** which breaks polysaccharide starch into disaccharide maltose.

$$\text{Starch} \xrightarrow[\text{(Salivary amylase)}]{\text{Ptyalin}} \text{Maltose}$$

(ii) **Gastric juices.** It contains three substances–hydrochloric acid, the enzyme pepsin and mucus. A small amount of gastric lipase enzyme is also present in the gastric juice. Due to the presence of hydrochloric acid, the gastric juice is acidic in nature. In the acidic medium, the enzyme pepsin begins the digestion of proteins in the stomach. The mucus helps to protect the stomach wall from its own secretions of hydrochloric acid. The gastric lipase breaks down the fats or lipids present in the food partially.

(2 marks)

(b) (i) Digestion of food is completed only in small intestine.

(ii) Wall of the intestine bears a number of finger-like projections called villi. Villi provide a large surface area to the lining layer for absorption.

(iii) The epithelium, lining the villi, is made of cells having a number of very fine projections known as microvilli. Microvilli are specialised for absorption.

(iv) Wall of the intestine, especially the interior of villi, has lymph and blood vessels for carrying the absorbed food to different parts of the body.

(3 mark)

SECTION – B

25. **(d)** **(1 mark)**

26. **(a)** This is essential as a safety measure usually when an exothermic chemical reaction is carried out in a test-tube. **(1 mark)**

27. **(b)** **(1 mark)**

28. **(d)** Colour of pH paper in distilled water is green. Lemon juice is acidic in nature hence pH paper will turn orange. **(1 mark)**

29. **(b)** **(1 mark)**

30. **(b)** In acid blue litmus changes to red and in basic solution red litmus changes to blue. Hence blue litmus first changes its colour to red and then to blue. **(1 mark)**

31. **(c)** **(1 mark)**

32. **(d)** $I=\frac{V}{R}=\frac{6}{3}=2A$ **(1 mark)**

33. **(d)** No. of divisions between 2A = 20

$$\text{Least count} = \frac{2}{20} = 0.1A$$ **(1 mark)**

34. **(b)** **(1 mark)**

35. **(a)** **(1 mark)**

36. **(a)** **(1 mark)**

37. **(d)** **(1 mark)**

38. **(c)** **(1 mark)**

39. **(d)** The germinating seeds in the flask release CO_2 during respiration, which is absorbed by the KOH solution kept in the small test tube. This creates a partial vacuum in the flask that forces the water up the delivery tube. Thus, it proves that germinating seeds produce CO_2 during respiration. **(1 mark)**

40. **(c)** The nephron carries the urine into the collecting tubule of the kidney from where it is carried to ureter**.** From ureter, the urine passes into the urinary bladder**.** The urinary bladder stores the urine until it is forced out of the body, through an opening known as the urethra.The label II represents ureter, label III represents urinary bladder and label I represents urethra. **(1 mark)**

41. **(c)** A blockage in aortic valve would directly reduce blood flow to the lungs. **(1 mark)**

42. **(a)** The label X represents epiglottis. Epiglottis prevents food from entering into trachea. **(1 mark)**