

SUMMATIVE ASSESSMENT (SA-I)

MODEL PRACTICE PAPER - DEMO

Key features of Model Practice Papers:

- **Summative Assessment Papers** are based on the syllabus prescribed by the CBSE Board for **SA I** Examination.
- They are prepared exactly as per the sample papers suggested by the CBSE Board.
- The questions are selected in such a way that students get acquainted with each and every concept of the prescribed syllabus for **SA I**.
- All the questions provided in the **papers**, are supported with detailed and authentic answers.
- **The Summative Assessment papers** will give you chance to practice more and more before the commencement of actual examination, for obtaining high scores.

Class X **SCIENCE**
SUMMATIVE ASSESSMENT (SA-I)
MODEL PRACTICE PAPER - DEMO
2011 – 2012

Time allowed: 3 hours

Maximum Marks: 80

General Instructions:

- (i) The question paper comprises of two sections, A and B. You are to attempt both the sections.
- (ii) All questions are compulsory.
- (iii) There is no overall choice. However, internal choice has been provided in all the three question of five marks category. Only one option in such question to be attempted.
- (iv) All questions of section A and all questions of section B are to be attempted separately.
- (v) Question numbers 1 to 4 in section A are one mark questions. They are to be answered in one word or one sentence.
- (vi) Question numbers 5 to 13 are two mark questions, to be answered in about 30 words each.
- (vii) Question numbers 14 to 22 are three mark questions, to be answered in about 50 words each.
- (viii) Question numbers 23 to 25 are five mark questions, to be answered in about 70 words each.
- (ix) Question numbers 26 to 41 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.

Section (A)

- Q1.** Define S.I. unit of electric current.
- Q2.** Name the two devices used for harnessing solar energy.
- Q3.** What are displacement reactions? Give an example.
- Q4.** Name one constituent each of magnalium and duralumin that is common to both.
- Q5.** What are the properties of a good fuel?
- Q6.** A wire is 2.0 m long, has cross-section area of 10 m^2 and resistance of 10Ω . Calculate resistivity of the material of wire.
- Q7.** A bulb is rated 10.0 V and 500 mA. Calculate its power and resistance.
- Q8.** What is corrosion? Why aluminium sheet does not corrode easily?
- Q9.** Why ionic compounds have high melting point and boiling point?
- Q10.** Two circular coils P and Q are placed close to each other. If the current in the coil P is changed, will some current be induced in the coil Q? Give reason in support of your answer.
- Q11.** If saliva does not get secreted in the mouth, what will happen to the digestion of food?
- Q12.** When a green iron salt is heated strongly, its colour changes to reddish brown and odour of burning sulphur is given out.

Now answer these questions:

- (a) Name the iron salt.
- (b) Name the type of reaction that occurs during heating of iron salt.
- Q13.** Give reasons:
- (a) Plaster of Paris should be stored in a moisture proof container.
- (b) Sodium hydrogen carbonate is used as an antacid.

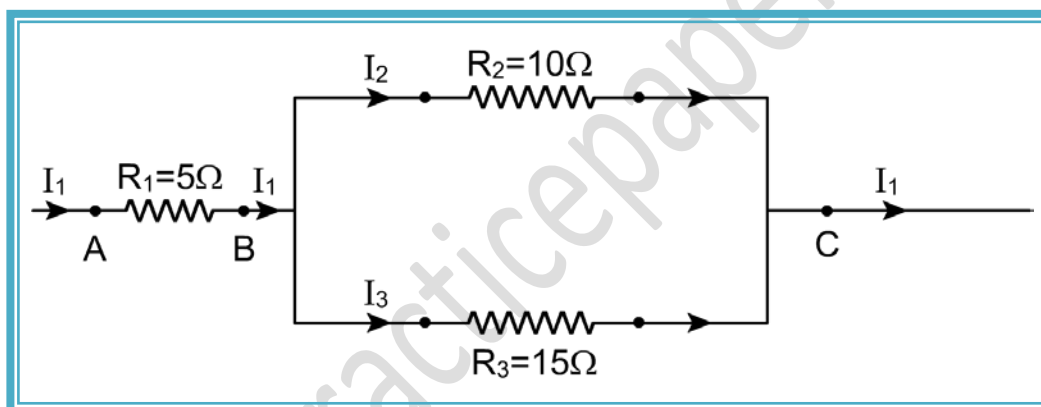
Q14. What is Ocean Thermal Energy (OTE)? Briefly describe the working of an Ocean Thermal Energy Plant (OTEP).

Q15. When two resistors x and y are connected in parallel, then net resistance is 2Ω and when connected in series its value is 9Ω . Calculate value of both resistances.

Q16. Three resistances are connected as shown in the figure. The current of 1 A is flowing through resistance 5Ω .

On the basis of above information, what will be the:

- I. Potential difference across AB and across AC?
- II. Current through the other two resistors?
- III. Total resistance of the circuit?



Q17. How can we find the direction of the:

- i. magnetic field which is produced around a straight conductor carrying current.
- ii. force which is experienced by the current carrying straight conductor placed in a magnetic field which is perpendicular to it.
- iii. current induced in a coil due to its rotation in a magnetic field.

Q18. How does control and coordination occur in human body? Explain.

Q19. Name the functional unit of nervous system, draw its labelled diagram. Mention the chemical through which nerve impulse is conducted at synapse.

Q20. (a) Which one of the two contains higher concentration of OH^- ions?

1 M NaOH or 1 M NH_4OH

(b) Can we prepare a dilute acid by adding water to the concentrated acid?
Give reason in the support of your answer.

Q21. Explain the pH change as the cause of tooth decay. Mention the role of tooth paste in preventing cavities.

Q22. Write the following reactions in the form of a balanced equation.

- (i) Magnesium reacts with steam to form Magnesium oxide and hydrogen gas.
- (ii) Lead nitrate reacts with dilute sulphuric acid to form white precipitate of lead sulphate and nitric acid.
- (iii) Barium chloride solution reacts with zinc sulphate solution to give zinc chloride and barium sulphate.

Q23. Answer the following questions:

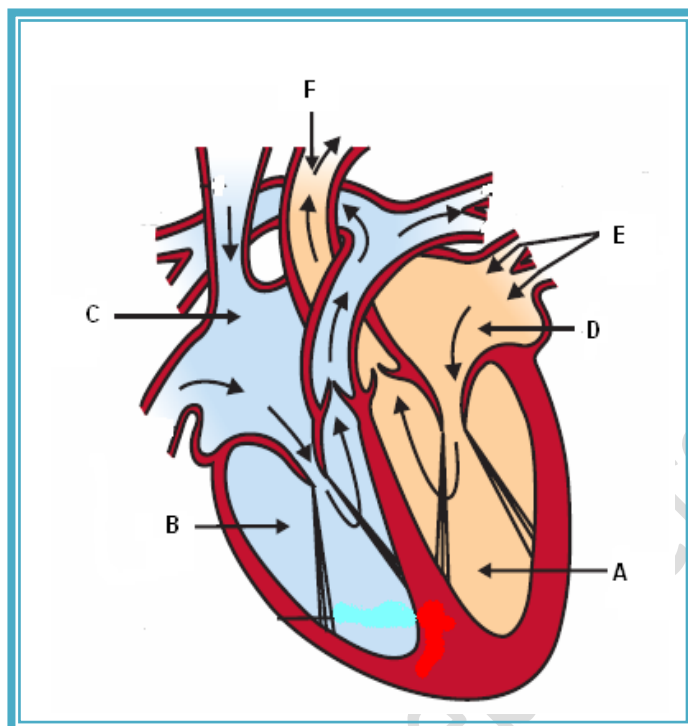
- a) What is an electromagnet? What does it consists of?
- b) Name one material used to make (i) a permanent magnet (ii) a temporary magnet.
- c) How can you make an electromagnet in your school laboratory?

OR

- a) What are magnetic field lines? Explain how the direction of a magnetic field at a point is determined by the compass needle?
- b) List any three properties of magnetic field lines.
- c) Draw magnetic lines of force around a straight current carrying conductor.

Q24. Answer the following questions:

- a) Observe the given diagram of a human heart and label its parts marked as A, B, C, D, E and F.



- b) Why blood circulation in human is a double circulation?
 c) What is the difference between human heart and the heart of a reptile?

OR

Describe the process of urine formation in human kidney.

Q25. Give reasons for the following actions:

- (i) Na and K are stored under kerosene oil.
- (ii) Aluminium is a highly active metal; even then it can be used to make utensils for cooking.
- (iii) Platinum, gold and silver are used to make jewellery.
- (iv) Lemon is used for restoring the shine of tarnished copper articles.
- (v) Tungsten is used for making filaments of incandescent lamps.

OR

What is meant by 'refining of metals'? Describe the electrolytic refining of copper with a neat and labelled diagram.

Section (B)

Q26. Stomatal aperture is surrounded by

- a) Subsidiary cells
- b) Guard cells
- c) Mesophyll cells
- d) None of the above

Q27. During the preparation of a temporary mount of a leaf peel to show stomata, Rajesh has followed the following steps:

- i. Took a leaf peel.
- ii. Observed leaf peel under microscope.
- iii. Placed leaf peel on a clean, dry glass slide.
- iv. Put a drop of glycerine on the peel and cover with coverslip.

The correct sequence of steps is

- a) I ,iii, iv , ii
- b) I, ii, iii, iv
- c) I ,ii, iv , iii
- d) I ,iv, iii , ii

Q28. Which of the following reagent is used by the students to stain leaf peel during temporary mounting?

- a) Glycerine
- b) Safranin
- c) Iodine solution
- d) Light green

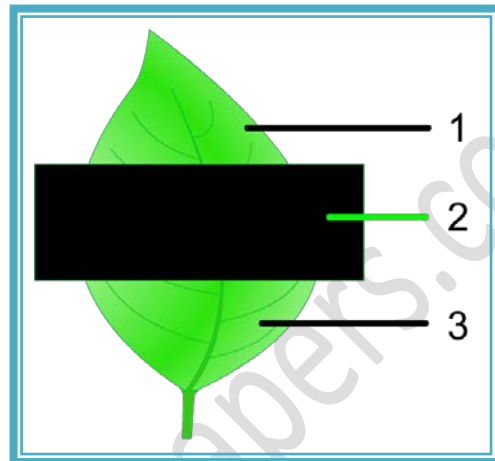
Q29. Glycerine is used as mounting medium because it

- a) stains the material
- b) cleans the material

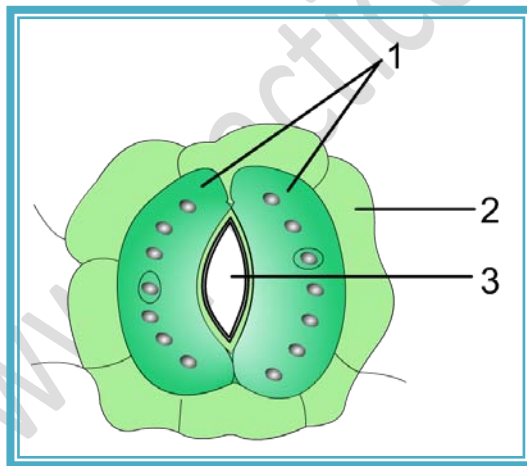
- c) prevents the material from drying
- d) enlarges the material

Q30. In the given diagram, a leaf is partially covered with black paper which is used in the experiment “to show that light is necessary for the process of photosynthesis”. At the end of the experiment, which part(s) of the leaf will give positive result with an iodine solution?

- a) 1 only
- b) 2 only
- c) 1 and 3
- d) 1,2 and 3

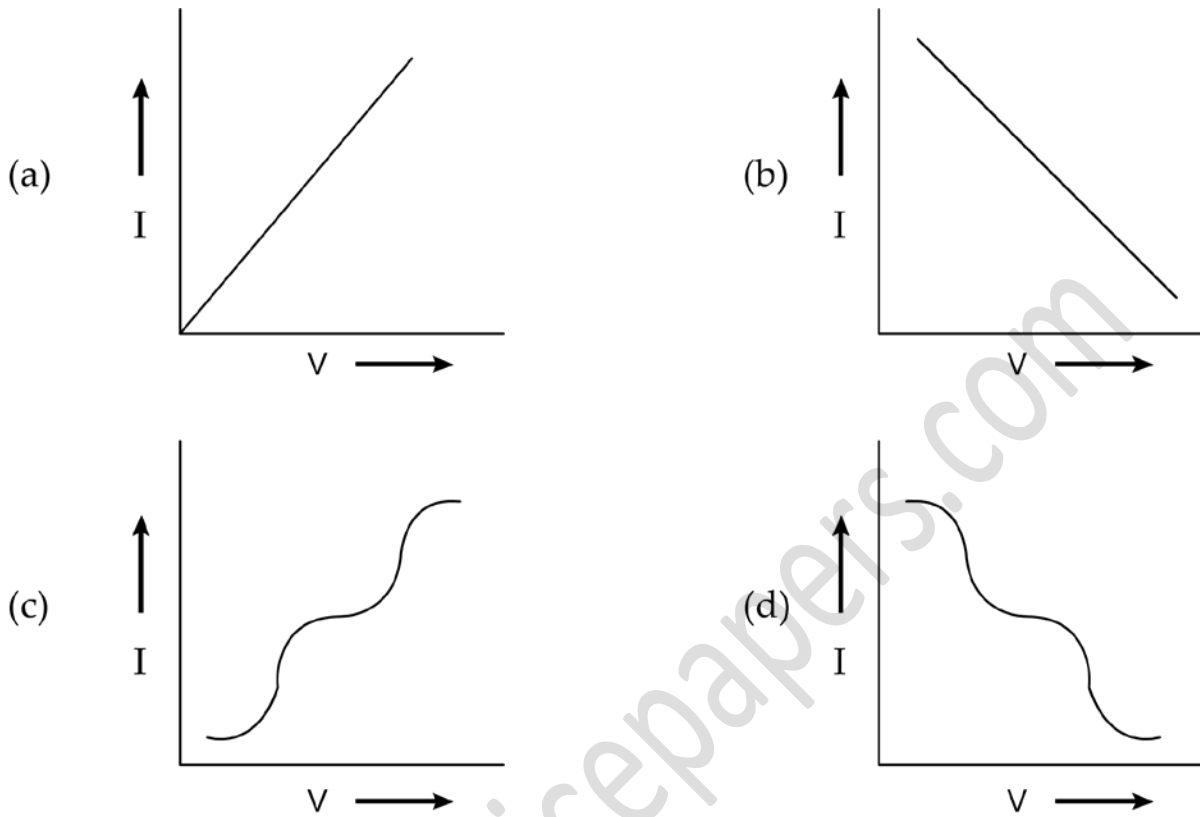


Q31. In the given diagram of stomata, the correct labelling of 1, 2 and 3 is

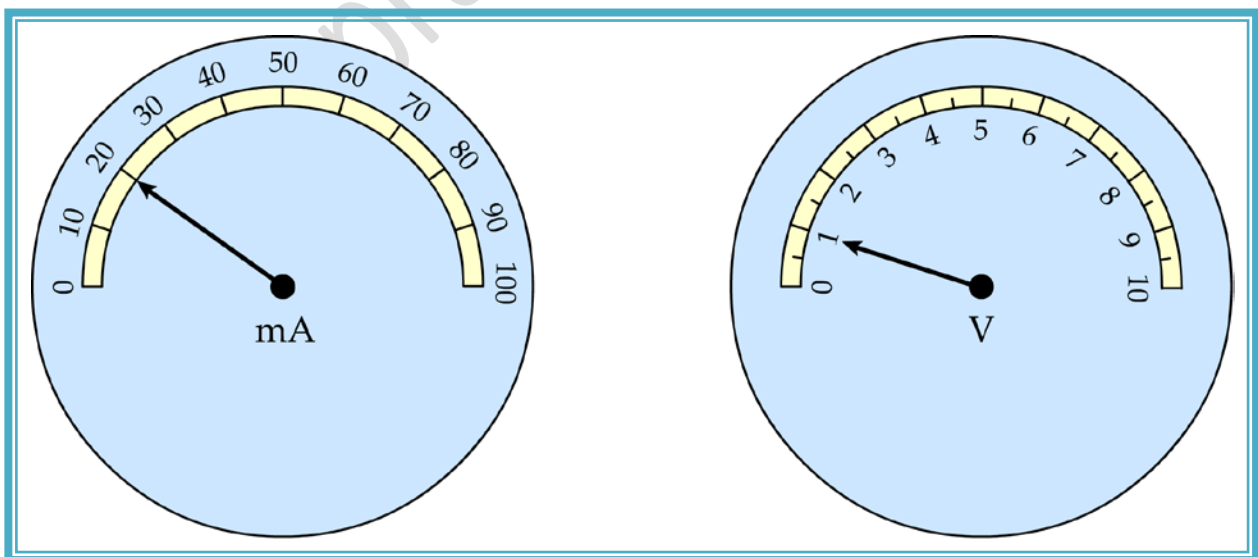


- a) 1 guard cells 2 stomatal opening 3 epidermal cell
- b) 1 stomatal opening 2 guard cells 3 epidermal cell
- c) 1 guard cells 2 epidermal cell 3 stomatal opening
- d) 1 stomatal opening 2 guard cells 3 epidermal cell

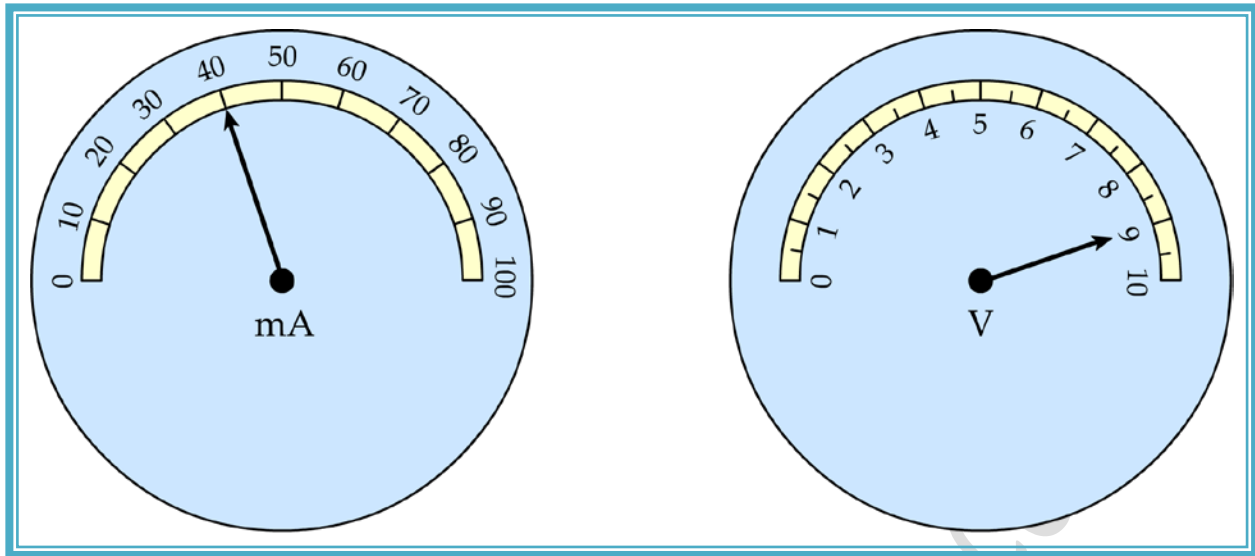
Q32. Which of the given graphs represents V-I variation for a conductor that follows Ohm's law?



33. Readings of voltmeter and ammeter observed by a student are as follows:



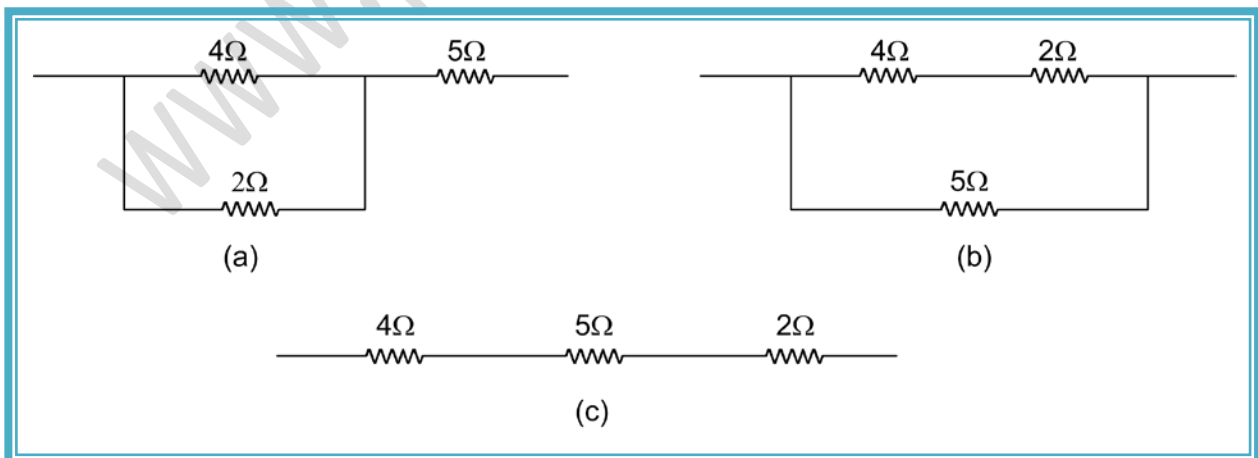
He connected the circuit for Ohm's law and observed the following readings:



What will be the resistance of the conductor?

- a. 400 Ω
- b. 800 Ω
- c. 40 Ω
- d. 80 Ω

Q34. Which one of the following resistances connections will give equivalent resistance of 11 Ω ?



- (a) Only a
- (b) Only c

- (c) Only b
- (d) b and c

Q35. Two resistances x and y are connected in series. Their equivalent resistance will be:

- (a) $x + y$
- (b) xy
- (c) $x - y$
- (d) $\frac{x}{y}$

Q36. Electric current is measured by.....

- (a) Ammeter
- (b) Voltmeter
- (c) Potentiometer
- (d) None of the above

Q37. Which one of the following is a diprotic acid?

- (a) Hydrochloric acid
- (b) Formic acid
- (c) Sulphuric acid
- (d) Hydrofluoric acid

Q38. Which one of the following gas will be liberated, when an acid reacts with metal carbonate?

- (a) CO_2
- (b) H_2
- (c) SO_2
- (d) CO

Q39. Which one of the following is a strong acid?

- (a) Carbonic acid
- (b) Tartaric acid
- (c) Oxalic acid
- (d) Nitric acid

Q40. When an aluminium strip is kept in a solution of iron sulphate, then the time required for the solution to change its colour from green to colourless is

- (a) Instant
- (b) An hour
- (c) 8 hours
- (d) 24 hours

Q41. The gas evolved when zinc is treated with NaOH solution is

- (a) H₂
- (b) CO₂
- (c) O₂
- (d) NO₂

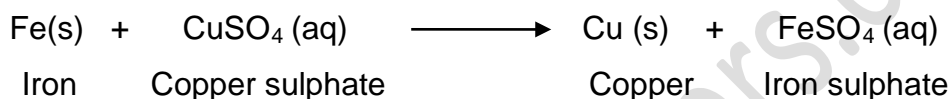
SOLUTION OF MODEL PRACTICE PAPER - DEMO

Section (A)

A1. When 1 coulomb charge flows through a conductor in 1 second, then current flowing through conductor is said to be 1 ampere.

A2. Solar cell, Solar cooker.

A3. More reactive element displaces less reactive element from its compound.



A4. Aluminium or Magnesium.

A5. Properties of a good fuel are:

- It produces large amount of heat.
- It produces less amount of smoke.
- It is easily available.
- It is easily stored and transported.

A6. $\rho = \frac{RA}{L}$

$$= \frac{(10 \times 10)}{2} = 50 \Omega\text{m}$$

A7. $V = 10 \text{ V}$, $I = 500 \text{ mA} = 0.5 \text{ A}$

$$P = VI$$

$$= (10 \text{ V})(0.5 \text{ A}) = 5 \text{ W}$$

$$R = \frac{V}{I}$$

$$= \frac{10}{0.5} = 20 \Omega$$

A8. Corrosion is the process in which metals are eaten up gradually by the action of air, moisture or a chemical on their surface which leads to the formation of metal oxides, carbonates, sulphates etc.

Aluminium does not corrode easily because it forms a layer of aluminium oxide over the surface, when it comes in contact with oxygen. The layer is non-porous, protective and prevents the further corrosion of aluminium.

A9. Ionic compounds are made up of anions and cations. There is a strong force of attraction between the oppositely charged ions. A large amount of energy is needed to break this force of attraction and to melt or boil the ionic compound. Therefore, the ionic compounds have high melting point and boiling point.

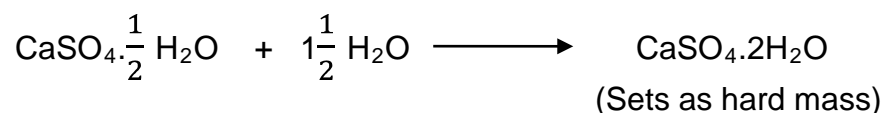
A10. Yes, some current will be induced in the coil Q. When the current in the coil P is changed, the magnetic field linked with it also changes. As coil Q is placed close to P, magnetic field lines linked with coil Q also change. Due to change in magnetic field lines associated with coil Q, current is also induced in it.

A11. In the absence of saliva, digestion of starch will be inhibited. Salivary amylase of saliva hydrolyses 30% of the starch in the mouth and changes starch into maltose, isomaltose and 'limit' dextrin. Denaturation of proteins of food is also affected in the absence of saliva.

A12. (a) Ferrous sulphate (FeSO_4).

(b) Decomposition reaction.

A13. (a) It will react with moisture and set into hard mass.



(b) Sodium hydrogen carbonate is a mild base. Therefore, it neutralises the excess acid present in the stomach and relieves indigestion.

A14. Solar energy stored in the ocean in the form of heat energy is called Ocean Thermal Energy. The Ocean Thermal Energy Plant (OTEP) work, if the

temperature difference between ocean layers is about 20°C (or more). The warm surface water is used to boil a volatile liquid like pressurised ammonia. This vapour is used to run the turbine of a generator to get electricity. The cold water coming from the depth is pumped up to condense the vapour to liquid ammonia. Then ammonia condensate is pumped to evaporator through a pump.

A15. Let resistance of x is R_1 and resistance of y is R_2 .

When x and y are connected in parallel, net resistance is given by:

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_p = \frac{R_1 R_2}{R_1 + R_2} = 2\Omega \quad \dots(1)$$

When x and y are connected in series, net resistance is given by:

$$R_s = R_1 + R_2 = 9\Omega \quad \dots(2)$$

From (1) and (2),

$$R_1 R_2 = 18 \quad \dots(3)$$

From (2) and (3),

$$R_1(9 - R_1) = 18$$

$$R_1^2 - 9R_1 + 18 = 0$$

On solving:

$$R_1 = 3\Omega, R_2 = 6\Omega$$

A16. (I) potential difference across AB = Potential difference across R_1

$$\text{Potential difference across } R_1, V_1 = I_1 R_1 = 1 \times 5 = 5 \text{ V}$$

potential difference across BC, V_2 = potential difference across equivalent resistance of R_2 and R_3

$$\text{Since } R_2 \text{ and } R_3 \text{ are in parallel, } R_p = \frac{10 \times 15}{10 + 15} = 6 \Omega$$

Potential difference across BC = $1 \times 6 = 6 \text{ V}$

Potential difference across BC = potential difference across AB +
potential difference across BC

$$= 5\text{V} + 6\text{V} = 11\text{V}$$

(II) Current through R_2 , $I_2 = \frac{V_2}{R_2} = \frac{6}{10} = 0.6 \text{ A}$

Current through R_3 , $I_3 = I_1 - I_2 = 1 - 0.6 = 0.4 \text{ A}$

(III) Total resistance between A and C = $R_1 + R_P = 5 \Omega + 6 \Omega = 11 \Omega$

A17.i. Right hand thumb rule can be used to find the direction of magnetic field produced around a straight conductor carrying current. If a straight conductor is held in right hand, such that thumb points in the direction of the current, then the tips of the finger show the direction of magnetic field or magnetic lines of force.

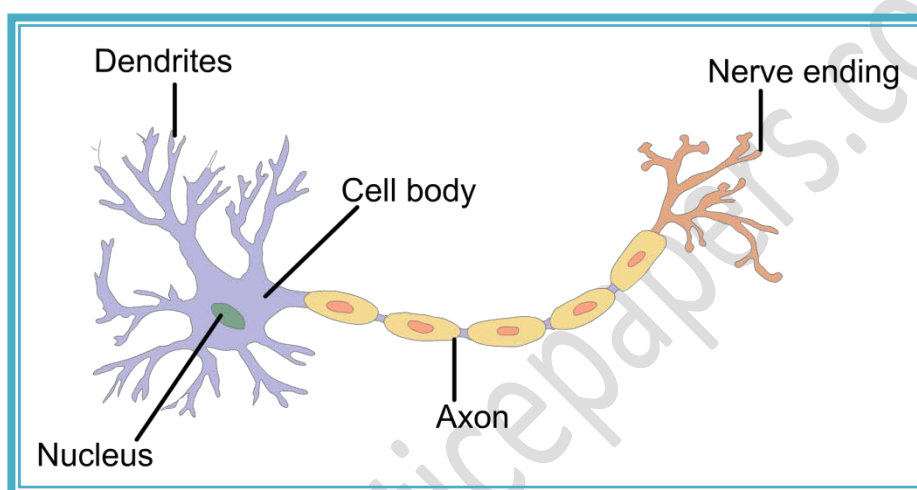
ii. Fleming's left hand rule can be used to find the direction of a force experienced by a current carrying straight conductor placed in a magnetic field which is perpendicular to it. According to this rule, stretch the thumb, forefinger and central finger of your left hand such that they are mutually perpendicular. If the fore finger points in the direction of magnetic field and the central finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.

iii. Fleming's Right Hand Rule can be used to find the direction of current induced in a coil due to its rotation in a magnetic field. According to the Fleming's right hand rule 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 point in the direction of induced current.

A18. All the living organisms, except unicellular organisms like *Amoeba* and *Paramecium*, have different organ systems to perform different types of processes. These organ systems cannot work independently but they work in coordination. There are of two types of coordination- chemical (hormones) and nervous (neurons) coordination.

The nervous system enables the organism body to adjust quickly according to the changes in the environment for the short duration whereas the endocrine system is designed to maintain the changes over a longer duration. Hormones regulate growth and development for many years.

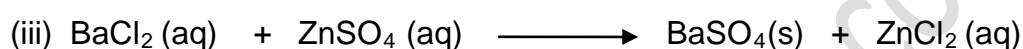
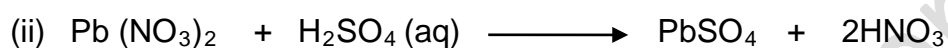
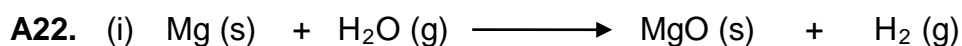
A19. The functional unit of a nervous system is the Neuron.



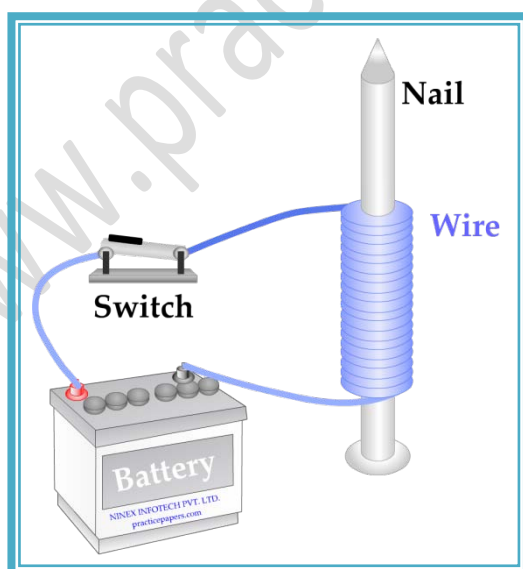
At the synapse, nerve impulse is conducted through a chemical called neurotransmitter, e.g., Acetylcholine.

- A20.** (a) 1 M NaOH has high concentration of OH^- ions because sodium hydroxide is a strong base, it completely ionizes to give high concentration of hydroxyl ions whereas ammonium hydroxide is a weak base, it does not completely ionizes.
- (b) We cannot prepare dilute acid by adding water to concentrated acid because when water is added to the concentrated acid, then large amount of heat is evolved at once. This heat changes some of the water to steam explosively, which can splash the acid on our face or clothes and cause acid burns. Even the glass container may break due to excessive heating.

A21. When we eat sugary food, an acid is produced in the mouth by the degradation of sugar and food particles due to the action of bacteria. The acid decreases the pH in the mouth. If pH is lower than 5.5, the tooth decay starts. Tooth paste is slightly alkaline and neutralises the acid produced. Therefore, prevents tooth decay.

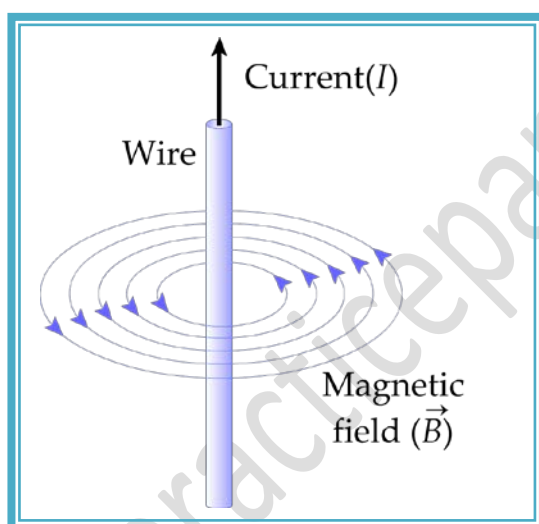


- A23.** (a) An electric current can be used for making temporary magnets known as electromagnet. It consists of a long coil of insulated copper wire wound on a soft iron core.
- (b) Permanent magnet is usually made of an alloy such as: Carbon steel.
Temporary magnet is usually made of soft iron.
- (c) Take a rod of soft iron and wind a coil of insulated copper wire round it. When the two ends of the copper coil are connected to a battery, an electromagnet is formed.



OR

- (a) A path along which a free magnetic north pole will move in a magnetic field is called magnetic field lines. The direction of the magnetic field is taken to be the direction in which a north pole of the compass needle moves at that point.
- (b) Properties of magnetic field lines are following:
- The number of magnetic field lines in a certain area indicates the relative strength of the magnetic field in that area.
 - The arrows on the field lines indicate the direction of the force on the north pole of a test magnet.
 - The magnetic field lines never intersect each other.
- (c) Magnetic field lines around a current carrying straight conductor



- A24.** (a) A – Left ventricle , B- Right ventricle, C- Right atrium (auricle) ,D- Left atrium (auricle) ,E- Pulmonary veins and F-Aorta.
- b) During each cardiac cycle, the entire blood of the body passes through the heart twice in human beings. That is why blood circulation is known as double circulation.
- c) Human heart is four chambered and reptiles heart is three chambered, except crocodiles and alligators have four chambered heart.

OR

Urine consists of nitrogenous waste such as urea or uric acid which is to be removed from the blood. Kidney has its functional units called nephron which filters urine from the blood.

It involves two processes:

- (a) Ultra-filtration.
- (b) Selective reabsorption.

(a) Ultra-filtration: Ultra-filtration occurs in the Bowman's capsule of the nephron. Blood enters into the glomerulus through an afferent arteriole and leaves out through an efferent arteriole. The walls of the capillaries of glomerulus are thin, permeable and in close contact with wall of Bowman's capsule. Blood in Bowman's capsule is under high pressure and the blood gets filtered here. This filtered fluid is called glomerular filtrate which contains water and dissolved substances, i.e. glucose, amino acids, urea and salts. The glomerular filtrate passes out to the renal tubule.

(b) Selective reabsorption: Useful substances like glucose, amino acids, salts and water which are present in the glomerular filtrate must get reabsorbed back into the blood capillaries from the renal tubules of the nephrons.

Reabsorption of water depends on water content and concentration of excretory wastes in the blood. Finally the urine forming in each kidney eventually enters a long tube, the ureter, which connects the kidneys with the urinary bladder.

- A25.** (i) Na and K are highly reactive metals. They react vigorously with water and air but these are passive in kerosene. So, they are stored in kerosene.
- (ii) It is used to make utensils because
- (a) It is a good conductor of heat.
 - (b) Aluminium is a strong and cheap metal.

- (c) Aluminium resists corrosion.
- (iii) Platinum, gold and silver are highly unreactive metals. Therefore, they do not corrode. They are also highly malleable and ductile that's why, these metals are used to make jewellery.
- (iv) When copper articles are exposed to moist air, they get tarnished by the formation of a green coating of basic copper carbonate.

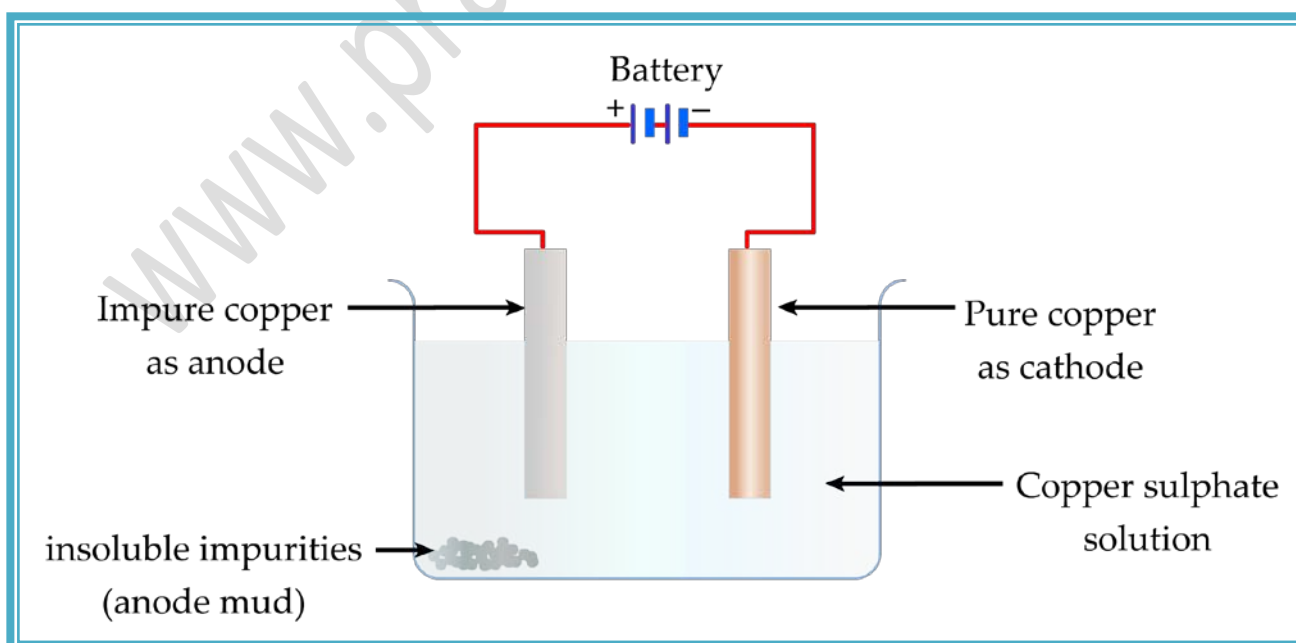
Lemon juice contains citric acid. When tarnished copper articles are rubbed with lemon juice, the weak acid present in the juice dissolves the basic copper carbonate and the original shine of the copper articles returns.

- (v) Tungsten has high resistance and high melting point; therefore it is used for making filaments of incandescent lamps

OR

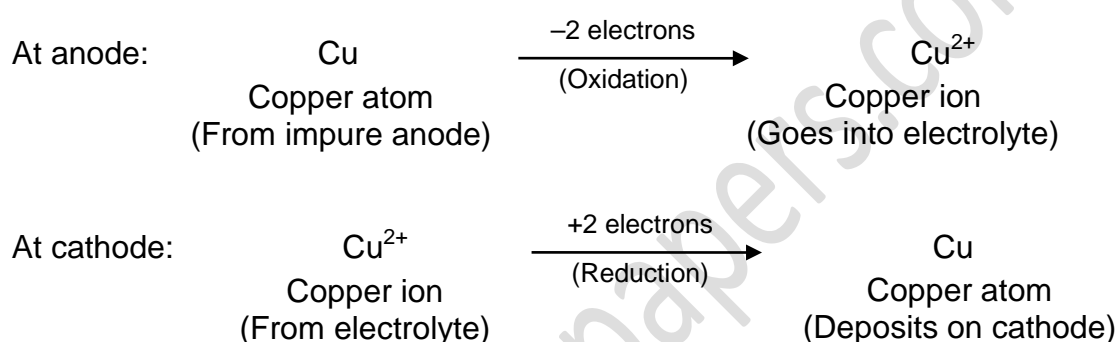
The process of removing impurities from the metal obtained by reduction is called refining of metals.

Electrolytic Refining: Many metals like copper, nickel, silver etc. are refined by this method. The impure copper is refined in the following way:



In an electrolytic tank, acidified copper sulphate ($\text{CuSO}_4 + \text{dilute H}_2\text{SO}_4$) solution forms the electrolyte. A block of impure copper is made the anode by connecting it to the positive terminal of a battery. A thin strip of highly pure copper metal is made the cathode by connecting it to the negative terminal of the battery.

The following reactions take place at the anode and cathode when an electric current is passed.



As the electrolysis proceeds, anode becomes thinner whereas cathode becomes thicker. Pure copper is scraped or removed from the cathode. The soluble impurities present in the impure metal pass in to solution whereas insoluble impurities fall below the anode as anode mud or anode sludge.

Section (B)

A26. Correct option: b

Explanation: Opening and closing of the stomata is due to the activity of the guard cells.

A27. Correct option: a

A28. Correct option: b

Explanation: Safranin stains epidermal cells of the leaf peel.

A29. Correct option: c

Explanation: Glycerine prevents specimen from drying during preparation of temporary mount.

A30. Correct option: c

Explanation: Uncovered portion of the leaf will give positive result with iodine solution as it will form starch in the presence of sunlight.

A31. Correct option: c

A32. Correct option: a

Explanation: There is direct proportionality between V and I.

A33. Correct option: a

Explanation: After removing the zero errors

$$I = 20 \text{ mA}, V = 8 \text{ V}$$

$$R = \frac{V}{I} = \frac{8}{.02} = 400 \Omega$$

A34. Correct option: b

Explanation: $R = R_1 + R_2 + R_3$

A35. Correct option: a

A36. Correct option: a

A37. Correct option: c

Explanation: Sulphuric acid (H_2SO_4) contains two ionizable H^+ ions.

A38. Correct option: a

Explanation: Acid + Metal \longrightarrow Salt + CO_2

A39. Correct option: d

A40. Correct option: a

Explanation: $2\text{Al}(\text{s}) + 3\text{FeSO}_4(\text{aq}) \longrightarrow \text{Al}_2(\text{SO}_4)_3(\text{aq}) + 3\text{Fe}(\text{s})$

It is very fast reaction.

A41. Correct option: a

Explanation: $2\text{NaOH} + \text{Zn} \longrightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2\uparrow$