

**Additional Practice Question Paper**  
**Class X**  
**Science (Subject Code – 086)**

**Max. Marks: 80**

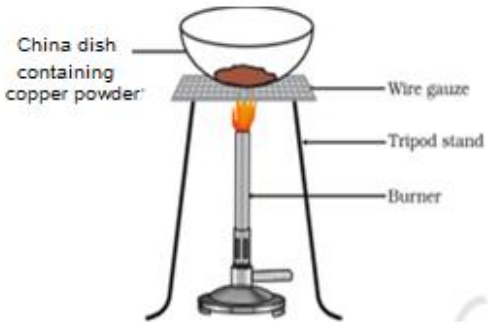
**Time Allowed: 3 hours**

**General Instructions:**

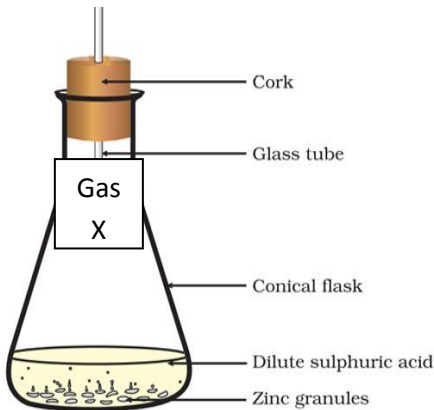
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective-type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

**Section-A**

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for an incorrect response.

| Q. Nos | Questions   | Mark | COMP. |
|--------|---|------|-------|
| 1      |  <p>Which of the following observations is correct for the above given experimental diagram?</p> <ol style="list-style-type: none"> <li>a) Red-coloured copper is reduced to black-coloured copper(I) oxide</li> <li>b) Red-coloured copper is oxidized to red-coloured copper(I) oxide</li> <li>c) Red-coloured copper is reduced to black-coloured copper (II) oxide</li> <li>d) Red-coloured copper is oxidized to black coloured copper(II) oxide</li> </ol> | 1    | U     |
| 2      | <p>The ratio (x:y) of reactants Fe and H<sub>2</sub>O in the given balanced chemical equation is .</p> $x\text{Fe(s)} + y\text{H}_2\text{O(g)} \rightarrow \text{Fe}_3\text{O}_4\text{(s)} + 4\text{H}_2\text{(g)}$ <ol style="list-style-type: none"> <li>a) x:y = 2:3</li> <li>b) x:y = 3:4</li> <li>c) x:y = 1:4</li> <li>d) x:y = 4:1</li> </ol>  | 1    | U     |

|   |   |   |   |
|---|---|---|---|
| 3 | <p>Washing soda is hydrated</p> <p>a) Sodium hydrogen carbonate<br/>b) Calcium hydrogen carbonate<br/>c) Slaked carbonate<br/>d) Sodium carbonate.</p>  | 1 | K |
| 4 | <p>The metal X does not react with cold water but floats on hot water with formation of colourless bubbles. Which of the following represents metal X.</p> <p>a) Aluminium<br/>b) Copper<br/>c) Magnesium<br/>d) Lead</p>   | 1 | U |
| 5 | <div style="text-align: center;"> <math display="block">\text{HC}\equiv\text{CH} \xrightarrow[+\text{H}_2]{\text{Pd}} \boxed{\text{X}}</math> <math display="block">\text{C}_2\text{H}_5\text{OH} \xrightarrow{\text{Hot conc H}_2\text{SO}_4} \boxed{\text{X}}</math> </div> <p>Which of the following correctly represents 'X' in the above chemical changes?</p> <p>a) Ethane<br/>b) Ethene<br/>c) Ethyne<br/>d) Ethanoic acid</p> | 1 | U |
| 6 | <p>Which of the following structures correctly represent the electron dot structure of a Nitrogen molecule?</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center;"> <p>a)</p> </div> <div style="text-align: center;"> <p>b)</p> </div> <div style="text-align: center;"> <p>c)</p> </div> <div style="text-align: center;"> <p>d)</p> </div> </div>                       | 1 | K |

|    |  |   |    |
|----|--|---|----|
| 7  | <p>Which of the following tests is given by the gas 'X' produced in the set up shown?</p>  <p>a) Lime water turns milky white<br/> b) Puts off a burning matchstick<br/> c) Burning matchstick produces a pop sound and the flame puts off<br/> d) Choking smell with the smell of burning Sulphur</p>  | 1 | AN |
| 8  | <p>Gastric juice is secreted by gastric glands and contains hydrochloric acid, mucus, and pepsin. Which activity will be affected in the absence of hydrochloric acid?</p> <p>a) Digestion of proteins.<br/> b) Digestion of carbohydrates<br/> c) Digestion of lipids<br/> d) Digestion of starch.</p>  | 1 |    |
| 9  | <p>Rajesh noticed that a potted plant kept in the window of his room shows bending towards sunlight. This could be due to:</p> <p>a) More growth in the well lit region due to diffusion of auxin hormone<br/> b) More growth in the region away from light due to diffusion of auxin hormone<br/> c) More growth in the well lit region due to diffusion of cytokinin hormone<br/> d) More growth in the region away from light due to diffusion of cytokinin hormone</p> | 1 |    |
| 10 | <p>The lining of the alimentary canal has certain muscles that contract rhythmically in order to push the food forward. This process is called:</p> <p>a) Translocation<br/> b) Transpiration<br/> c) Peristalsis<br/> d) Autotrophism</p>   | 1 |    |
| 11 | <p>A cross between pure tall and pure short pea plants gives hybrid tall pea plants in the first generation. What would be the genotypic ratio in the offspring of the second generation if these F1 plants were self-pollinated?</p> <p>a) 3:1<br/> b) 9:3:3:1<br/> c) 1:2:1<br/> d) 1:1</p>  | 1 |    |

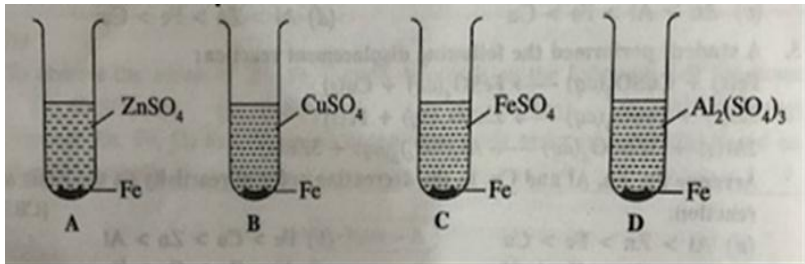
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|----|--|---|----|
| 12 | During exhalation, the exchange of gases takes place between<br>a) Alveoli of the lungs and blood.<br>b) Alveoli of lungs and tissue fluid.<br>c) Blood and body tissues<br>d) Tissue fluid and blood capillaries  | 1 |    |
| 13 | The light enters from air to glass having refractive index 1.5. the speed of light in glass is:<br>a) $3 \times 10^8 \text{m/s}$<br>b) $2 \times 10^8 \text{m/s}$<br>c) $1.5 \times 10^8 \text{m/s}$<br>d) $2.25 \times 10^8 \text{m/s}$   | 1 | RK |
| 14 | For a convex mirror the image distance ( $v$ ) = 5 cm, focal length ( $f$ ) = 10 cm and height of the image ( $h$ ) = 7.5 cm. The correct representation according to sign conventions is:<br>a) $v = -5 \text{ cm}$ , $f = -10 \text{ cm}$ and $h_i = -7.5 \text{ cm}$<br>b) $v = -5 \text{ cm}$ , $f = +10 \text{ cm}$ and $h_i = -7.5 \text{ cm}$<br>c) $v = +5 \text{ cm}$ , $f = -10 \text{ cm}$ and $h_i = +7.5 \text{ cm}$<br>d) $v = +5 \text{ cm}$ , $f = +10 \text{ cm}$ and $h_i = +7.5 \text{ cm}$ | 1 | RK |
| 15 | If all the organisms of one trophic level in a food chain die, what would be its impact on the population of organisms in other trophic levels? It will<br>a) remain the same in the next trophic level<br>b) increase in the next trophic level<br>c) increase in the lower trophic level.<br>d) remain the same in the lower trophic level.  | 1 |    |
| 16 | The chemicals that are non-degradable, get progressively accumulated at each trophic level, and their concentration is seen maximum in the bodies of top consumers. This phenomenon is known as:<br>a) Eutrophication<br>b) Pollution<br>c) Accumulation<br>d) Biomagnification  | 1 |    |
|    | Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:<br>a) Both A and R are true, and R is the correct explanation of A.<br>b) Both A and R are true, but R is not the correct explanation of A.<br>c) A is true but R is false.<br>d) A is false but R is true.  | 1 |    |
| 17 | Assertion (A): Copper ions migrate from the anode to the cathode during electrorefining of copper.<br>Reason (R): In the electrorefining process, metal ions accept electrons at the anode and are deposited as pure metal.  | 1 |    |
| 18 | Assertion (A): A lot of difference in the concentrations of ions was observed by a scientist between the fluid in xylem cells of roots and that of the soil.   | 1 |    |

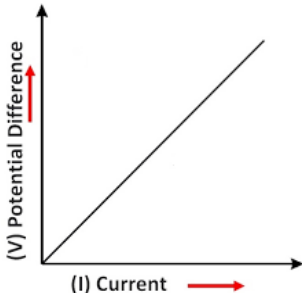
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|----|--|---|----|
|    | Reason (R): Xylem cells in the roots of plants which come in contact with the soil actively take up ions.  |   |    |
| 19 | Assertion (A): One circuit with 15 A current rating is used for appliances such as geysers and air coolers.<br>Reason (R): Appliances with metallic body are connected to an earth wire with low resistance. | 1 | AP |
| 20 | Assertion (A): All kitchen waste cannot form compost.<br>Reason (R): Material like milk packets may not be biodegradable.  | 1 |    |

### Section-B

**Question No. 21 to 26 are very short answer questions**

|        |   |                    |                     |             |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
|--------|---|--------------------|---------------------|-------------|-------------|-------------|---|-------------------|--------------------|-------|-------|---|-----------------|-------|---------------------|-------|---|---|
| 21     | Salts are formed by the neutralisation reaction between an acid and a base. Complete the following table by filling the missing data: <table><tr><td>Sl.no.</td><td>Name of the salt</td><td>Formula</td><td>Parent Base</td><td>Parent Acid</td></tr><tr><td>1</td><td>Ammonium Chloride</td><td>NH<sub>4</sub>Cl</td><td>.....</td><td>.....</td></tr><tr><td>2</td><td>Copper Sulphate</td><td>.....</td><td>Cu(OH)<sub>2</sub></td><td>.....</td></tr></table>  | Sl.no.             | Name of the salt    | Formula     | Parent Base | Parent Acid | 1 | Ammonium Chloride | NH <sub>4</sub> Cl | ..... | ..... | 2 | Copper Sulphate | ..... | Cu(OH) <sub>2</sub> | ..... | 2 | U |
| Sl.no. | Name of the salt  | Formula            | Parent Base         | Parent Acid |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 1      | Ammonium Chloride   | NH <sub>4</sub> Cl | .....               | .....       |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 2      | Copper Sulphate   | .....              | Cu(OH) <sub>2</sub> | .....       |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 22     | i) Name the reproductive and non-productive parts of <i>Rhizopus</i> .<br>ii) How are the spores protected till they begin to grow?   | 2                  |                     |             |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 23     | Amount of urine produced generally decreases in summers as compared to other seasons if we don't keep ourselves sufficiently hydrated. Justify.<br><b>OR</b><br>What is the advantage of having a four-chambered heart in birds and mammals?  | 2                  |                     |             |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 24     | Give reasons for the following:<br>a) Red traffic signals can be seen from a very long distance.<br>b) Stars appear to be slightly higher than their actual position.   | 1+1                | AP                  |             |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |
| 25     | Imagine a current carrying circular loop of wire on the plane of your answer sheet. The magnetic field inside the loop is into the plane of the paper.<br>i) What must be the direction of the current in the loop?<br>ii) State the rule used here.<br><b>OR</b><br>a) State the rule to determine the direction of the force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it.<br>b) When will the magnitude of the displacement of the rod be the largest? | 1+1                | AP                  |             |             |             |   |                   |                    |       |       |   |                 |       |                     |       |   |   |

|  |   |     |   |
|--|---|-----|---|
| 26   | Marked decline in the thickness of ozone layer was noticed in the 1980s. Which human activity can be held accountable for this change? What is the possible effect of this on human health?   | 2   |   |
| <p style="text-align: center;"><b>Section-C</b></p> <p style="text-align: center;"><b>Question No. 27 to 33 are short answer questions</b></p> |   |     |   |
| 27   | <p>Sakshi was comparing the reactivity of different metals for her science project. She added iron filings in four test tubes A,B,C,D containing aqueous solutions of <math>\text{ZnSO}_4</math>, <math>\text{CuSO}_4</math>, <math>\text{FeSO}_4</math> and <math>\text{Al}_2(\text{SO}_4)_3</math> respectively as shown in the figure –</p>  <p>a. In which of the test tubes she will observe the reaction to be most vigorous</p> <p>b. What is the reason for her observation?</p> <p>c. Write a well-balanced equation of the reaction in (b)</p>  | 3   | A |
| 28   | <p>Metal 'A' is used in the thermite process as a reducing agent. When 'A' is heated with oxygen it gives an oxide 'B' which is amphoteric in nature. Identify A and B. Illustrate with the help of chemical equations the reaction of B with HCl and NaOH respectively.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) "Carbon cannot be used to reduce metal oxides of sodium, magnesium, calcium, and aluminium to respective metals". Comment.</p> <p>b) These metals are obtained by electrolytic reduction of their molten chloride. Write the reactions that occur at the anode and cathode during the electrolytic reduction of molten sodium chloride.</p> <p>c) Illustrate with the help of a chemical equation reduction of manganese dioxide with Aluminium powder.</p> | 3   | U |
| 29   | State any three reasons to justify the use of contraceptive methods.  | 3   |   |
| 30   | <p>Given below are some disorders noticed in some patients. It could it be due to malfunctioning of which part of brain:</p> <p>a) Loss of sensation of feeling full</p> <p>b) Lowered ability to salivate</p> <p>c) Difficulty in maintaining the posture and balance in body</p>  | 3   |   |
| 31   | A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find the nature, position and the size of the image formed.   | 1x3 | U |

|   |  |     |   |
|---|--|-----|---|
|   | <p style="text-align: center;"><b>OR</b></p> <p>An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm.</p> <p>a) Use lens formula to find the distance of image from the lens.</p> <p>b) Draw a ray diagram to justify your answer in part (a).</p>   |     |   |
| 32  | <p>a) A current of 10 A flows through a conductor for two minutes.</p> <p>i) Calculate the amount of charge passing through the conductor.</p> <p>ii) If the charge of an electron is <math>1.6 \times 10^{-19}</math> C, then calculate the total number of electrons flowing through the conductor.</p> <p>b) V-I graph for a conductor is as shown in the figure:</p> <div style="text-align: center;">  <p style="text-align: center;">What do you infer from this graph?</p> </div>  | 2+1 | U |
| 33  | <p>a) Draw the pattern of the magnetic field lines around a current-carrying solenoid.</p> <p>b) Mention two precautions that should be taken to avoid the overloading of domestic electric circuits.</p>  | 2+1 | R |
| <b>Section-D</b><br><b>Question No. 34 to 36 are long answer questions.</b> |  |     |   |
| 34  | <p>An organic compound 'P' is a constituent of wines. 'P' on reacting with acidified <math>K_2Cr_2O_7</math> forms another compound 'Q'. When a piece of sodium is added to 'Q', a gas 'R' evolves which burns with a pop sound when a burning matchstick is brought near it.</p> <p>a) Give the chemical name of compound P.</p> <p>b) Mention another use of the compound 'P' apart from the use mentioned in the question.</p> <p>c) Illustrate with the help of chemical equation the conversion of 'P' into 'Q'.</p> <p>d) Give a balanced equation to depict the reaction of Q with sodium.</p> <p>e) What happens when 'P' is heated with conc. <math>H_2SO_4</math> at 443 K, write its chemical equation.</p> <p style="text-align: center;"><b>OR</b></p> <p>An organic compound 'X' is a liquid at room temperature. It is also a very good solvent and has the molecular formula <math>C_2H_6O</math>. Upon oxidation 'X' gives 'Y'. 'Y' releases a gas 'W' with brisk effervescence on reacting with <math>NaHCO_3</math>. X reacts with Y in the presence of conc. <math>H_2SO_4</math> to give another compound 'Z' which</p> | 1x5 | A |



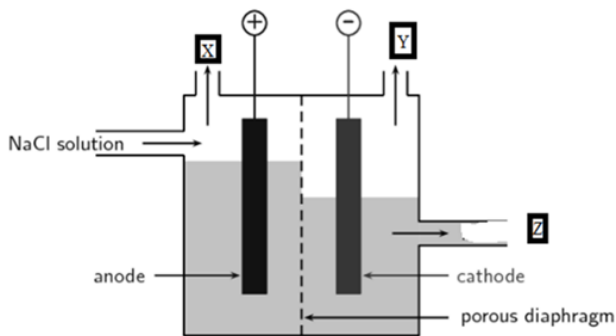
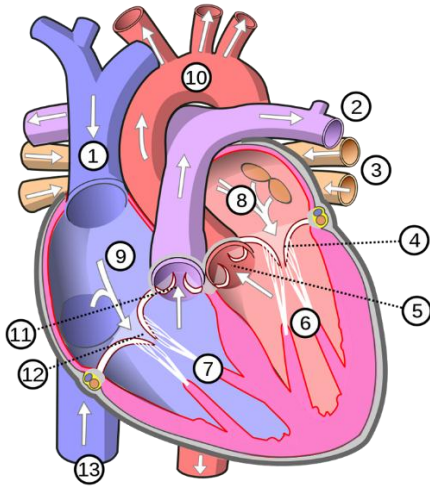
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|----|--|-------|----|
|    | <p>has a pleasant smell. Z.</p> <p>a) Give the chemical name and chemical formula of Y.</p> <p>b) How will you test for the gas 'W'?</p> <p>c) Depict the formation Y and Z using chemical equations.</p> <p>d) Name the reaction of formation of 'Z'.</p> <p>e) Give any one use of 'Z'?</p>  |       |    |
| 35 | <p>a) Flow of energy in a food chain is unidirectional. Justify the statement.</p> <p>b)</p> <p>i) In a cross between pea plants having round green seeds and wrinkled yellow seeds, what progeny is expected in F1 and F2 generation?</p> <p>ii) What would be the impact on the ratio of F2 generation, if F1 progeny plants inherited a single whole gene set from each parent? Give reason for your answer.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) How does blood sugar level get regulated in the human body?</p> <p>b)</p> <p>i) Which hormone is secreted into the blood when you are under stress? Name the gland that secretes this hormone.</p> <p>ii) How does it help the body to cope up in an emergency situation?</p> | 2+3   |    |
| 36 | <p>A person is unable to see objects distinctly placed within 75 cm from his eyes.</p> <p>a) Name the defect of vision the person is suffering from.</p> <p>b) List its two possible causes.</p> <p>c) Calculate the power of the lens needed to correct this defect. Assume that the near point for the normal eye is 25 cm.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) Why is a normal eye not able to see clearly the objects placed closer than 25 cm?</p> <p>b) With the help of a diagram show recombination of the spectrum of white light.</p> <p>c) List two essential conditions for observing a rainbow.</p>  | 1+2+2 | AP |

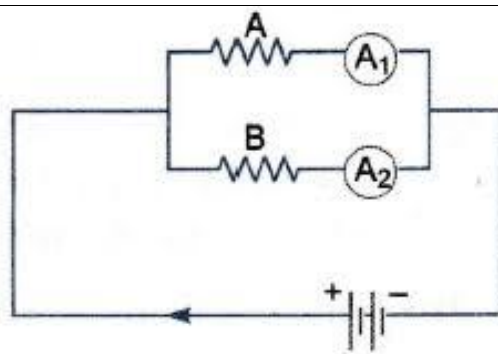
### SECTION - E

**Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.**

|    |   |       |   |
|----|---|-------|---|
| 37 | <p>Give any two uses of pH in everyday life other than mentioned</p> <p>Give any two uses of pH in everyday life other than mentioned in the context.</p> <p>In the diagram given below when electricity is passed through an aqueous solution of a common salt, A substance 'Z' is produced along with the evolution of gases 'X' and 'Y'. When a burning matchstick is brought near the gas 'Y' it burns with a pop sound, whereas X is used for disinfecting drinking water. When gas 'X' is passed through a solution of slaked lime, an insoluble substance 'A' is produced.</p> | 1+1+2 | U |
|----|---|-------|---|



|    |  |       |    |
|----|--|-------|----|
|    |  <p>a) Write the name of gases 'X' and 'Y'.</p> <p>b) Write the balanced chemical equation for the formation of substance 'A'.</p> <p>c) Write your observations:</p> <p>i) if a drop of blue litmus solution is added to the aqueous solution of substance 'Z'</p> <p>ii) if methyl orange is added to substance 'Z'</p> <p>OR</p> <p>Write a balanced chemical reaction that takes place when 'X' and 'Y' react with each other. The product so produced will turn blue litmus red only when wet, why?</p>   |       |    |
| 38 |  <p>a) Which chamber of the heart (6, 7, 8 or 9) pumps blood to the lungs for oxygenation, name it? Identify and name the blood vessels that carry blood to the lungs.</p> <p>b) Identify the structure at number 12 and state its function.</p> <p>c) Why do chambers 6 and 7 have thicker muscular walls than chambers 8 and 9? Name each of these chambers.</p> <p>OR</p> <p>i) Identify and name the chamber that receives oxygen rich blood and name the blood vessels which bring it.</p> <p>ii) State the significance of separation of right and left side of heart as seen in the above figure.</p> | 1+1+2 |    |
| 39 | <p>Rahima was investigating a circuit for her school project. She wanted to demonstrate the effect of length on the resistance of a conductor. The following is the given circuit with resistors A and B that are made of the same metal and the same thickness but 'A' is twice as long as 'B'. The total current in the circuit is 6 A and the Voltage of the battery is 12 V.</p>   | 1+1+2 | AP |

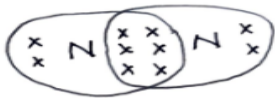


- a) What will be the resistance in the circuit? (1)
- b) Determine the value of ' $R_A$ ' and ' $R_B$ '. (1)
- c) Determine the current in both the ammeters. Will the current in ' $A_1$ ' and ' $A_2$ ' be the same? Justify your answer. (2)

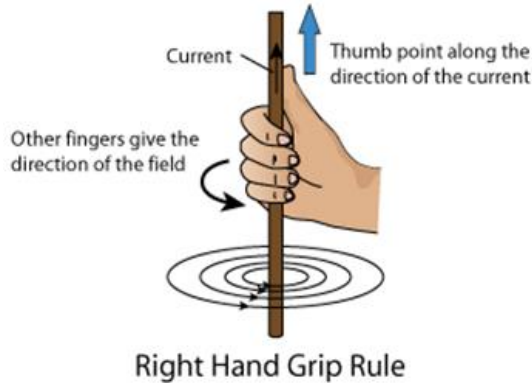
**OR**

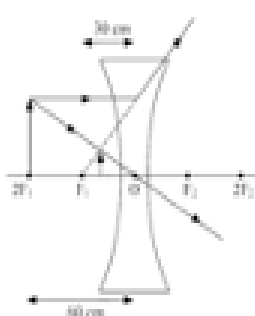
- c) Define resistivity. What are the factors affecting the resistivity of a conductor?

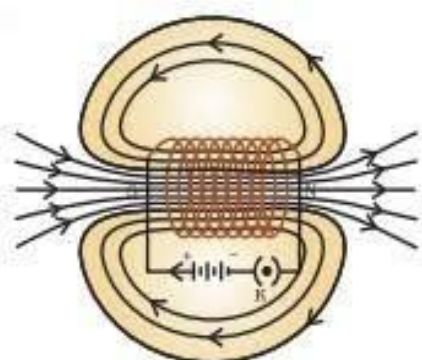
**Marking Scheme (2023-24)**  
**Class-X**  
**Science (Subject Code – 086)**

| Q. No.           |   | Marks |
|------------------|---|-------|
| <b>Section A</b> |   |       |
| 1                | d) Red-coloured copper is oxidized to black coloured copper(II) oxide   | 1     |
| 2                | b) $x:y = 3:4$  | 1     |
| 3                | d) Sodium carbonate.  | 1     |
| 4                | c) Magnesium  | 1     |
| 5                | b) Ethene   | 1     |
| 6                | b)   | 1     |
| 7                | c) Burning matchstick produces a pop sound and the flame puts off   | 1     |
| 8                | a) Digestion of proteins.   | 1     |
| 9                | b) More growth in the region away from light due to diffusion of auxin hormone  | 1     |
| 10               | c) peristalsis  | 1     |
| 11               | c) 1:2:1  | 1     |
| 12               | a) Alveoli of lungs and blood   | 1     |
| 13               | b) $2 \times 10^8 \text{m/s}$   | 1     |
| 14               | d) $v = +5 \text{ cm}$ , $f = +10 \text{ cm}$ and $h_i = +7.5 \text{ cm}$   | 1     |
| 15               | c) will increase in the lower trophic level   | 1     |
| 16               | d) Biomagnification   | 1     |
| 17               | c) A is true but R is false   | 1     |
| 18               | a) Both A and R are true, and R is the correct explanation of A.  | 1     |
| 19               | b) Both A and R are true, but R is not the correct explanation of A.  | 1     |
| 20               | a) Both A and R are true, and R is the correct explanation of A   | 1     |
| <b>Section-B</b> |   |       |
| 21               | 1. Ammonium hydroxide ( $\text{NH}_4\text{OH}$ ), Hydrochloric acid. ( $\text{HCl}$ )<br>(0.5 +0.5)<br>2. $\text{CuSO}_4$ , Sulphuric acid ( $\text{H}_2\text{SO}_4$ )<br>(0.5 +0.5)  | 2     |
| 22               | i) Non-reproductive parts are hyphae and reproductive parts are the sporangia which contain the spores. (1)<br>ii) The spores are covered by thick walls that protect them until they come in contact with a moist surface and begin to grow. (1) | 2     |

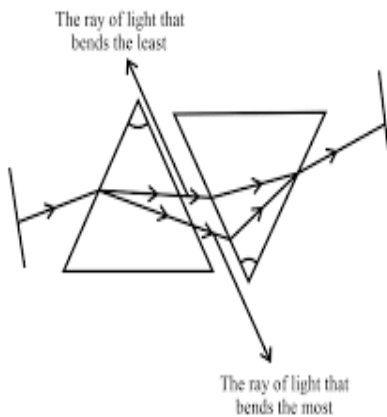
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| 23 | <p>The amount of urine produced is regulated by selective reabsorption in the renal tubule of the nephron. It depends on how much excess water is there in the body and how much-dissolved waste is there to be excreted. (1)</p> <p>In summers more water is lost due to sweating so there is more reabsorption of water by the body to maintain osmotic balance. (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>This prevents oxygenated and deoxygenated blood from mixing. (0.5)</p> <p>This allows a highly efficient supply of oxygenated blood to all parts of the body (1)</p> <p>This is useful in animals with high energy needs such as birds and mammals. (0.5)</p> | 2 |
| 24 | <p>a) Because red colour light has the highest wavelength and is least scattered. (1)</p> <p>b) Because the optical density of atmospheric layers is more so the light travelling from space to the atmosphere bends towards the normal and thus its position appears slightly raised. (1)</p> <p style="text-align: center;"><b>OR</b></p> <div data-bbox="555 958 1114 1422" data-label="Image"> </div> <p>Full marks for a labelled diagram</p>   | 2 |
| 25 | <p>i) The current is in a clockwise direction. (1)</p> <p>ii) The right-hand thumb rule states that if you imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field. (1)</p> <p style="text-align: center;"><b>OR</b></p>   | 2 |

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|                   |  <p style="text-align: center;"><b>Right Hand Grip Rule</b></p> <p style="text-align: center;"><b>OR</b></p> <p>a) Fleming's left-hand rule: Stretch the forefinger, middle finger and the thumb of your left hand such that they are mutually perpendicular to each other. If the forefinger indicates the direction of magnetic field and the middle finger indicates the direction of current, then the thumb will indicate the direction of motion of the conductor or the force acting on the conductor. (1)</p> <p>b) The displacement of the rod is largest when the direction of current is at right angles to the direction of the magnetic field. (1)</p>   |   |
| 26                | <p>Air pollutants like CFCs caused the depletion of this protective shield. (1)</p> <p>Ozone layer shields the surface of earth from harmful UV rays from the sun which are known to cause skin cancer in human beings. (1)</p>  | 2 |
| <b>Section- C</b> |  |   |
| 27                | <p>a) Test tube B (1)</p> <p>b) Copper is lower to Iron in the reactivity series so displacement reaction will be maximum (1)</p> <p>c) <math>\text{Fe (s)} + \text{CuSO}_4 \text{ (aq.)} \longrightarrow \text{FeSO}_4 \text{ (aq.)} + \text{Cu (s)}</math> (1)</p>   | 3 |
| 28                | <p>(A) - Aluminium (0.5)    (B) - <math>\text{Al}_2\text{O}_3</math> (0.5)</p> <p><math>\text{Al}_2\text{O}_3 + 6\text{HCl} \longrightarrow 2\text{AlCl}_3 + 3\text{H}_2\text{O}</math> (1)</p> <p><math>\text{Al}_2\text{O}_3 + 2\text{NaOH} \longrightarrow 2\text{NaAlO}_2 + \text{H}_2\text{O}</math> (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>a) Carbon cannot reduce the oxides of sodium, magnesium, calcium, aluminium, etc., to the respective metals. This is because these metals have more affinity for oxygen than carbon. (Metals, Na, Mg, Ca and Al hve more affinity towards oxygen than C) (1)</p> <p>b) The reactions are</p> <p>– At cathode<br/> <math>\text{Na}^+ + \text{e}^- \rightarrow \text{Na}</math> (0.5)</p> <p>– At anode<br/> <math>2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-</math> (0.5)</p> <p>c) <math>3\text{MnO}_2 \text{ (s)} + 4\text{Al(s)} \rightarrow 3\text{Mn(l)} + 2\text{Al}_2\text{O}_3 \text{ (s)} + \text{Heat}</math> (1)</p> | 3 |

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| 29 | a) To prevent unwanted pregnancies (1)<br>b) To control population and birth rate (1)<br>c) To prevent the transfer of sexually transmitted diseases (1)   | 3 |
| 30 | a) Fore brain<br>b) medulla in hind – brain<br>c) Cerebellum   | 3 |
| 31 | <p>Given, <math>u = -15</math> cm, <math>f = 20</math> cm, <math>v = ?</math><br/>           Using lens formula, <math>1/v - 1/u = 1/f</math> (0.5)<br/> <math>1/v = -1/60</math><br/> <math>V = -60</math> cm (0.5)<br/> <math>m = h_i/h_o = v/u</math> (0.5)<br/> <math>h_i = 16</math> cm (0.5)<br/>           Image formed is virtual, erect and magnified. (Any two) (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>a) We need to calculate the image distance.<br/>           Given, <math>u = -60</math> cm, <math>f = -30</math> cm, <math>v = ?</math><br/>           Using lens formula, <math>1/v - 1/u = 1/f</math> (0.5)<br/> <math>1/v = 1/f + 1/u</math><br/> <math>1/v = -1/30 - 1/60 = -1/20</math><br/> <math>v = -20</math> cm (1)<br/>           The diminished image is formed on the same side as the object and at a distance of 20 cm from the lens. (0.5)</p> <p>b)</p>  <p style="text-align: center;">Diagram (1)</p> | 3 |
| 32 | <p>a) Given, <math>I = 10</math> A, <math>t = 2</math> min = <math>2 \times 60</math> s = 120 s</p> <p>i) <math>Q = I \times t</math> (0.5)<br/> <math>\therefore Q = 1200</math> C (0.5)</p> <p>ii) <math>Q = ne</math> (0.5)<br/> <math>\therefore 1200 = n \times 1.6 \times 10^{-19}</math> C<br/>           or <math>n = 1200/1.6 \times 10^{-19} = 7.5 \times 10^{21}</math> electrons (0.5)</p> <p>b) As graph is a straight line, so it is clear from the graph that <math>V \propto I</math>. Hence the resistance of the conductor is constant. (1)</p>  | 3 |

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| 33                |  <p>a) Diagram (1), direction of current (0.5), direction of field lines (0.5)</p> <p>b)</p> <ol style="list-style-type: none"> <li>1. Do not connect too many devices in the same socket.</li> <li>2. Do not connect faulty appliances in the socket.</li> <li>3. Multiple high power consumption devices should not be connected at the same time. (any two) (0.5+0.5)</li> </ol>   | 3 |
| <b>Section- D</b> |   |   |
| 34                | <p>a) P = Ethanol (1)</p> <p>b) Industrial solvent/ ingredient of cough syrup/ homeopathic medicine / lab reagent - any one or any other (1)</p> <p><math>C_2H_5OH \xrightarrow{\text{acidified } K_2Cr_2O_7} CH_3COOH</math> (1)</p> <p>(P) (Q)</p> <p>c) <math>2Na + 2CH_3COOH \xrightarrow{\quad\quad\quad} 2CH_3COONa + H_2</math> (1)</p> <p>(Q) (R)</p> <p>d) Dehydration of ethanol occurs /</p> <p><math>C_2H_5OH \xrightarrow{\text{conc. } H_2SO_4} C_2H_4 + H_2O</math> (1)</p> <p>(P)</p> <p style="text-align: center;"><b>OR</b></p> <p>Ethanoic acid Y= <math>H_3COOH</math> (0.5+0.5)</p> <p>a) The gas evolved 'W' turns Lime water milky (1)</p> <p>b) <math>C_2H_5OH \xrightarrow{\text{Acid. } K_2Cr_2O_7} CH_3COOH</math> (1)</p> <p>(X) (Y)</p> <p><math>C_2H_5OH + CH_3COOH \xrightarrow{\quad\quad\quad} CH_3COOC_2H_5 + H_2O</math> (1)</p> <p>(X) (Y) (Z)</p> <p>c) Esterification Rn (0.5)</p> <p>d) Anyone use - perfumes/cosmetics;</p> <p style="text-align: center;"><math>H_2SO_4</math></p> <p><math>C_2H_5OH \xrightarrow{\quad\quad\quad} C_2H_4 + H_2O</math> (0.5)</p> | 5 |
| 35                | <p>a) The flow of energy is unidirectional in a food chain. The energy that is captured by the autotrophs does not revert back to the solar input and the energy which passes to the herbivores does not come back to autotrophs. As it moves progressively through the various trophic levels it is no longer available to the previous trophic levels. (2)</p> <p>b) i. F1 generation: All Round yellow (RrYy) (0.5)</p> <p>F2 generation: round yellow:9; round green:3; wrinkled yellow: 3<br/>wrinkled green :1 (1)</p>  | 5 |



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|    | <p>ii. If progeny plants inherited a single whole gene set from each parent, then the ratio 9:3:3:1 will not be obtained. (0.5)</p> <p>This is because the two characteristics “R” and “y” would then be linked to each other and cannot be independently inherited. (1)</p> <p style="text-align: center;"><b>OR</b></p> <p>a) When sugar levels in the blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced. The timing and amount of hormones to be secreted are regulated by the feedback mechanism. (2)</p> <p>Adrenaline; Adrenal gland (0.5 + 0.5)</p> <ul style="list-style-type: none"> <li>It acts on heart. Heart beats faster, resulting in more supply of oxygen to skeletal muscles.</li> <li>Breathing rate also increases because of contraction of diaphragm and the rib muscles. (1 + 1)</li> </ul>  |   |
| 36 | <p>a) Hypermetropia or long sightedness. (1)</p> <p>b) Two possible causes:<br/> Curvature of eye lens decreases. (1)<br/> Shortening of eye ball. (1)</p> <p>c) Given, <math>u = -25</math> cm, <math>v = -75</math> cm, <math>f = ?</math><br/> <math>\frac{1}{f} = \frac{1}{v} - \frac{1}{u}</math> (0.5)<br/> <math>f = 37.5</math> cm (0.5)<br/> <math>P = \frac{100}{f}</math> (0.5)<br/> <math>= +2.67</math> D (0.5)</p> <p style="text-align: center;"><b>OR</b></p> <p>a) The focal length of the eye lens cannot be decreased below a certain minimum limit. As a result, the sharp image of the object is not formed on the retina but behind the retina of the lens. (1)</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Diagram (1), labelling &amp; arrows (1)</p> <p>b) The necessary conditions for the formation of a rainbow are:<br/> i) The presence of water droplets in the atmosphere, and (1)<br/> ii) The sun must be at the back of the observer, i.e., the observer must stand with his back towards the sun. (1)</p> | 5 |

### Section - E

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| 37 | <p>Ant bite/ to prevent tooth decay/ antacid to reduce acidity</p> <p>a) <math>X = \text{Cl}_2</math> gas, <math>Y = \text{H}_2</math> gas (0.5 + 0.5)</p> <p>b) <math>\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}</math> (1)<br/>(A)</p> <p>c) (i) does not change to red, (ii) Yellow colour (1+1)</p> <p><b>OR</b></p> <p><math>\text{H}_{2(g)} + \text{Cl}_{2(g)} \rightarrow 2\text{HCl}_{(g)}</math> (1)</p> <p>The Hydrogen Chloride gas produced turns only wet blue Litmus red as HCl get dissociated in water to give out <math>\text{H}^+</math> ion. (1)</p>  | 4 |
| 38 | <p>a) 7. Right ventricle, 2. Pulmonary arteries (0.5+0.5)</p> <p>b) Valves - They ensure that blood does not flow backwards when atria or ventricles contract. (1)</p> <p>c) Left and right Ventricles (6 and 7) have thicker walls as compared to left and right atria (8 and 9).<br/>They have to pump blood out of the heart. They pump blood at a higher pressure to ensure it reaches all parts of the body. (1+1)</p> <p><b>OR</b></p> <p>i) 8. Left atrium, 3. pulmonary veins</p> <p>ii) The separation of the right and left side of the heart is useful to prevent mixing of oxygenated blood and deoxygenated blood. (1+1)</p>  | 4 |
| 39 | <p>a) <math>R = V/I</math> (0.5)<br/><math>= 12/6</math><br/><math>= 2 \Omega</math> (0.5)</p> <p>b) <math>R_A = 12/2</math><br/><math>= 6\Omega</math> (0.5)<br/><math>R_B = 12/4</math><br/><math>= 3 \Omega</math> (0.5)</p> <p>c) For the given circuit, <math>R \propto l</math> and <math>R \propto 1/I</math><br/>The resistance of 'A' is twice that of 'B' and so the current in both will not be the same but in the ratio of 1:2, so the current in 'A' will be 2A and that in 'B' will be 4A. (2)<br/><math>I_A = V/R_A = 12 / 6 = 2 \text{ A}</math><br/><math>I_B = V/R_B = 12/3 = 4 \text{ A}</math></p> <p><b>OR</b></p> <p>c) resistivity is defined as the electrical resistance of a conductor of unit cross-sectional area and unit length. (1)<br/>it is the characteristic property of the material and depends on the nature of the material. (1)</p> | 4 |