

## KENDRIYA VIDYALAYA SANGTHAN, JABALPUR REGION

## PRE-BOARD EXAMINATION 2024-25

## SCIENCE CLASS-X

MAXIMUM MARKS- 80

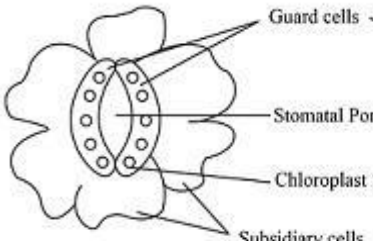
MARKING SCHEME/ANSWER KEY

SET-A

TIME DURATION- 3 Hours

| S.NO. | Expected answers                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Marks distribution                 |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 1.    | C] Magnesium ribbon burns with brilliant white light.                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                  |
| 2.    | D] Tartaric acid,HCl,Methanoic acid, Lactic acid                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                  |
| 3.    | B] 3.6,8.5,7,10                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                  |
| 4.    | A] Iron hinges on a gate                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1                                  |
| 5.    | A] Aluminum is more reactive than zinc                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1                                  |
| 6.    | A] Increase in the absorption of food                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1                                  |
| 7.    | A] Spinal cord                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                  |
| 8.    | C] Cerebellum                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1                                  |
| 9.    | D] Transport gametes                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                                  |
| 10.   | C] Fragmentation                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                  |
| 11.   | B]                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                                  |
| 12.   | B] - 50 CM                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                  |
| 13.   | A] A and D                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                  |
| 14.   | C] Both A and C                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                  |
| 15.   | A] Direction of Magnetic field                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                  |
| 16.   | D] Fish eating bird                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                                  |
| 17.   | A. Both A and R are true, and R is the correct explanation of A.                                                                                                                                                                                                                                                                                                                                                                                                               | 1                                  |
| 18.   | D] A is false but R is true                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                                  |
| 19.   | A] Both A and R are true and R is the correct explanation of A                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                  |
| 20.   | C] A is true but R is false                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1                                  |
| 21.   | A] s-Silver combines with the H <sub>2</sub> S present in the atmosphere and gets tarnished. This forms a black compound of silver sulphide (Ag <sub>2</sub> S).<br>Toothpaste is basic in nature and thus helps in removing the sulphide layer (acidic in nature) because of the neutralization reaction.<br>B] Black substance formed is Ag <sub>2</sub> S – Silver Sulphid<br>OR<br>A) Double displacement /Precipitation reaction<br>B) Redox reaction/ Oxidation reaction | 1+1<br><br><br><br><br><br><br>1+1 |
| 22.   | A] Second member- Propyne,Third member- Butyne<br>B] Second member- Propene,Third member-Butene                                                                                                                                                                                                                                                                                                                                                                                | $\frac{1}{2} \times 4 = 2$         |
| 23.   | - A] To prove that carbon dioxide is released during respiration.<br>- B] aerobic respiration, CO <sub>2</sub> is a product of either aerobic respiration or fermentation<br>fermentation does not take place in human cells                                                                                                                                                                                                                                                   | 1<br><br>1                         |
| 24.   | In a flower, fertilisation requires both male and female gametes. If pollination does not occur, male gametes will not be available hence fertilisation cannot take place.                                                                                                                                                                                                                                                                                                     | 2                                  |
| 25.   | A] The object has to be placed at a distance between 0-40 cm. This is because when the object is placed between F and P, the image formed is virtual, erect, and magnified.<br>B] Image will be larger than the object.                                                                                                                                                                                                                                                        | 1+1                                |

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| 26. | <p>Resistance of ABCD = <math>R_1 = 1 + 1 + 1 = 3 \Omega</math><br/> Resistance of AFED = <math>R_2 = 1 + 1 + 1 = 3 \Omega</math><br/> Now ABCD and AFED are in parallel combination<br/> The resistance between A and D = <math>\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}</math><br/> <math>= \frac{1}{3} + \frac{1}{3} = \frac{2}{3}</math><br/> <math>R = \frac{3}{2} \Omega</math></p>                                                                                                                                                                                                                                                                                 | 1+1   |
| 27. | A] Double displacement Reaction, B- 1 mark on balancing and 1 mark on chemical reaction and equation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1+2   |
| 28. | <p>A] Iron being more reactive than copper displaces copper from copper sulphate to form a green ferrous sulphate solution.<br/> B] Sodium and potassium are highly reactive metals and react vigorously with oxygen in the air and catch fire easily. They do not react with kerosene so kept in the same.<br/> C] Aluminium reacts with oxygen in the air and forms a protected oxide layer and prevents its corrosion.</p> <p style="text-align: center;">OR</p> <p>A] <math>S &gt; R &gt; P &gt; Q</math><br/> B] CU AND QSO<sub>4</sub><br/> C] Q is most reactive and R is least reactive</p>                                                                          | 1+1+1 |
| 29. | <p>a.1] Saksham is suffering from Diabetes mellitus.<br/> 2] This disease occurs due to deficiency of Insulin hormone which secretes from endocrine pancreas.<br/> b.] Absciscic acid</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1+1+1 |
|     | <p>A] Difference between acquired and Inherited traits.<br/> A person develops acquired traits during his life time..These are not passed from one generation to another. On the other hand inherited traits are present in a person since the time of his birth and are passed from one generation to another.<br/> B] Sex of the child- Female.<br/> C] 23 Pairs of chromosomes.</p> <p style="text-align: center;">OR</p> <p>A] 100% in F<sub>1</sub> generation will be tall and 75% in F<sub>2</sub> generation will be tall.<br/> B] Contrasting traits- Yellow seed and Green seed<br/> And Round seed and Wrinkled seed.<br/> Yellow -dominant ,Green- Recessive</p> | 1+1+1 |
| 31. | <p>A] The phenomenon is called dispersion. Red colour has a higher wavelength.<br/> B] Speed of violet light inside the prism is slowest and that of red is highest. Hence, the deviation of violet is maximum and that of red is minimum.<br/> C] Different colours of white light bend through different angles with respect to the incident beam of light due to differences in the speed of light of different wavelengths.</p>                                                                                                                                                                                                                                          | 1+1+1 |

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| 32. | Earth wire is a safety measure that provides a low resistance conducting path to the current. Sometimes due to excess heat or wear and tear, the live wire comes in direct contact with the metallic cover of the appliances, which can give an electric shock on touching them. To prevent from the shock the metallic part is connected to the earth through a three-pin plug due to which the current flows to the earth at the instant there is a short circuit.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1.5+1.5                                                                             |
| 33. | Energy available to Producers will be 20,000 joule.[Explain the answer by 10% law<br>X- CFC'S Y- Ozone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 +1                                                                                |
| 34. | <p>A] The milk will form into curd faster in bowl P.<br/>- Curdling of milk takes place due to formation of lactic acid by bacteria. In bowl Q, the lactic acid formed by bacteria has to first neutralize the baking soda, which is basic in nature, before the milk starts curdling.</p> <p>B] Dry HCl is not able to dissociate to give Hydrogen ions. Acids like HCl is only able to dissociate only in an aqueous medium. So Dry HCl does not changes the colour of the litmus paper.</p> <p>C] Gypsum- <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math>, Plaster of Paris- <math>\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}</math><br/>OR</p> <p>A] An olfactory indicator is defined as a substance whose smell varies when it is mixed with an acidic or basic solution. Onion, clove oil, Vanilla extract are the substances which can be used as olfactory indicators.</p> <p>B] <math>\text{HNO}_3</math> and <math>\text{H}_2\text{SO}_4</math> are strong acids.</p> <p>C] Egg shells are made up of calcium carbonate. When calcium carbonate reacts with HCl it liberates carbon dioxide.<br/>Balanced chemical equation-<br/><math>\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2</math></p> | <p>1+ 1</p> <p>2</p> <p>1</p> <p>1+1</p> <p>1<br/>2</p>                             |
| 35. | <p>A]</p>  <p>B] 1] They allow for gas exchange acting as an entryway for carbon dioxide (<math>\text{CO}_2</math>) and releasing the Oxygen (<math>\text{O}_2</math>) that we breath.<br/>2] Regulates water movement through transpiration.</p> <p>C] The opening and closing of stomata are controlled by the guard cells. When water flows into the guard cells, they swell up and the curved surface causes the stomata to open. When the guard cells lose water, they shrink and become flaccid and straight thus closing the stomata.</p> <p>OR</p> <p>A] Image- B- Artery, Image- A – Vein<br/>B] Any 4 difference between arteries and veins.<br/>C] Valves prevent the backflow of blood ,Valves help to ensure that the blood flow occurs in only one direction.</p>                                                                                                                                                                                                                                                                                                                                                                                                | <p>2</p> <p>1</p> <p>2</p> <p>1<br/><math>\frac{1}{2} \times 4 = 2</math><br/>2</p> |
| 36. | <p>A] The resistance of a conductor is directly proportional to the length of the conductor. The resistance of the metallic wire, when it is cut into ten parts of equal length is<br/><math>r = R_{10}</math><br/>Two such pieces when joined in series, the equivalent resistance of these two parts<br/><math>= r + r = 2r = 2R_{10}</math><br/>Series resistance of two parts <math>= 2 \times R_{10} = R_5</math><br/>such elements are connected in parallel. Therefore the total resistance <math>R'</math> will be</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3+2                                                                                 |

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |
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|            | $\frac{1}{R'} = \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} + \frac{1}{\frac{R}{5}} = \frac{25}{R}$ <p>Hence <math>R' = \frac{R}{25}</math></p> <p>b] Variable resistance</p> <p><b>Plug key closed [ Refer NCERT TEXT BOOK CLASS-10 TABLE 12.1 Chapter- Electricity</b></p> <p style="text-align: center;"><b>OR</b></p> <p>When the two coils A and B are used separately. <math>R = 24 \Omega</math>, <math>V = 220 \text{ V}</math></p> <p>Current, <math>I = \frac{V}{R} = \frac{220 \text{ V}}{24 \Omega} = \mathbf{9.167 \text{ A}}</math></p> <p>(ii) When the two coils are connected in series,</p> <p style="padding-left: 40px;"><math>R = 24 \Omega + 24 \Omega = 48 \Omega</math></p> <p style="padding-left: 40px;"><math>V = 220 \text{ V}</math></p> <p style="padding-left: 40px;">Current, <math>I = \frac{V}{R} = \frac{220 \text{ V}}{48 \Omega} = \mathbf{4.58 \text{ A}}</math></p> <p>(iii) When the two coils are connected in parallel.</p> <p style="padding-left: 40px;"><math>R = \frac{24 \times 24}{24 + 24} = 12 \Omega</math></p> <p style="padding-left: 40px;"><math>V = 220 \text{ V}</math></p> <p style="padding-left: 40px;">Current, <math>I = \frac{V}{R} = \frac{220 \text{ V}}{12 \Omega} = \mathbf{18.33 \text{ A}}</math></p> | <b>2.5+2.5</b> |
| <b>37.</b> | <p><b>A- 2] Catenation ,B-3] 10 C- 3] Ethanol and Ethanal</b></p> <p><b>D] 1] The members of the homologous series have same functional group.</b></p> <p><b>2] The difference in the molecular formula between one member and the next is <math>\text{CH}_2</math> or any other correct answer.</b></p> <p style="text-align: center;"><b>OR</b></p> <p><b>Examples of unsaturated hydrocarbon with double bond -ethene,propene or any other correct answer.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>1+1+1+1</b> |
| <b>38.</b> | <p><b>1] C- Concave plane and convex</b></p> <p><b>2] C)-same size as that of the object</b></p> <p><b>3] D-Either plane or convex</b></p> <p><b>4]Any 2 correct uses of convex mirror</b></p> <p style="text-align: center;"><b>OR</b></p> <p><b>Concave mirror ,Convex mirror</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>1+1+1+1</b> |
| <b>39.</b> | <b>1-C- B,D,A,C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>1+1+1+1</b> |
|            | <p><b>2 Regeneration in planaria</b></p> <p><b>3 Asexual reproduction</b></p> <p>4 binary fission is the splitting or division of a cell into two daughter cells</p> <p>The division of cytoplasm forms two individuals..</p> <p><b>Multiple fission:</b></p> <p>multiple fission is the division or splitting of a parent cell into two or more daughter cells. The division of cytoplasm directly forms multiple individuals.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |

OR

**Fragmentation occurs when an organism literally breaks off from itself.**

The broken fragments of the organism grow into individual separate organisms. On the other hand, regeneration is a form of asexual reproduction where the organism is capable of regrowing certain parts of its body when it loses them.