 **SINDHI HIGH SCHOOL, BENGALURU**

**I PRE-BOARD EXAMINATION [2023-24]**

**SUBJECT: SCIENCE (086)**

**Class: X SET - II Max Marks: 80**

**Date: 13.12.2023 Reading Time: 8:30 to 8:45 am**

**No of Sides: 08 Writing Time: 8:45 to 11:45 am**

**General Instructions:**

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

**SECTION - A**

**Select and write one most appropriate option out of the four options given for each of the questions 1 – 20**

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| **Q. NO** | **QUESTIONS** | **MARKS** |
| 1. | Calcium Oxide reacts vigorously with water to produce slaked lime.  **CaO(s) + H2O (l) ----🡪 Ca(OH)2 (aq)**  This reaction can be classified as:  (i) combination reaction (ii) exothermic reaction (iii) endothermic reaction (iv) displacement reaction  Which of the following is the correct option:  (a) (i) and (iii) (b) (iii) and (iv) (c) (i), (iii) and (iv) (d) (i) and (ii) | (1) |
| 2. | For the given chemical equation;  **aMg3N2 + bH2O → cMg(OH)2 + dNH3.**  When the equation is balanced, the coefficients a, b, c, d respectively are -  (a) 1, 3, 3, 2 (b) 1, 6, 3, 2 (c) 1, 2, 3, 2 (d) 2, 3, 6, 2 | (1) |
| 3. | Plaster of Paris hardens by:  (a) giving off CO2 upon heating strongly  (b) changing into CaCO3 on exposure to sunlight  (c) combining with water when water is added  (d) giving out water molecules to the atmosphere | (1) |
| 4. | Match the chemicals from column I with the colour of their solutions in water from column II:   |  |  |  | | --- | --- | --- | |  | Column (I)  name of compound | Column (II)  colour of their aqueous solutions | | **A** | Barium Sulphate | 1. Colourless | | **B** | Ferrous sulphate | 2. Blue | | **C** | Copper sulphate | 3. Pale green | | **D** | Zinc sulphate | 4. White |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | options | A | B | C | D | | (a) | 1 | 3 | 4 | 2 | | (b) | 4 | 2 | 1 | 3 | | (c) | 2 | 4 | 3 | 2 | | (d) | 4 | 3 | 2 | 1 | | (1) |
| 5. | Brine is an aqueous solution of:  a) sodium hydroxide b) sodium carbonate  c) sodium chloride d) sodium bicarbonate | (1) |
| 6. | Calamine is used to reduce the irritating effect of ant bite/sting because it reacts with X released due to the bite/sting of ants with Y present in calamine. X and Y respectively are :  (a) sodium hydrogen carbonate and formic acid  (b) formic acid and zinc carbonate  (c) acetic acid and common salt  (d) hydrochloric acid and zinc oxide | (1) |
| 7. | Which of the following hydrocarbons represents the isomer of butane?  (a) a (b) b (c) c (d) d | (1) |
| 8. | Ozone forms by the combination of free oxygen atoms and oxygen molecules. How do free oxygen atoms form at higher levels of the atmosphere?  a) by splitting of a molecule of oxygen in to two atoms in the presence of  high-energy UV radiations  b) by combination of a molecular oxygen with free oxygen atoms in the presence of low-energy UV radiations  c) by the combination of two molecular oxygen in the presence of high energy UV radiations  d) by the combination of three free oxygen atoms in the presence of lower energy UV radiations | (1) |
| 9. | If a round green seeded plant (RRyy) is crossed with wrinkled, yellow seeded plant (rrYY), the seeds obtained will be -  a) round and green b) wrinkled and green only  c) round and yellow d) wrinkled and yellow | (1) |
| 10. | Reflex arcs have evolved in animals because  a) many animals have a complex neuron network for thinking  b) reflex arcs are not efficient in quick responses  c) reflex arcs are not as efficient as true thought processing  d) The thinking processes of the brain is not fast enough. | (1) |
| 11. | Reproduction provides stability to the population because:  a) organism has the capacity to reproduce and occupy the niche  b) DNA copying ensures organisms pass on the characteristic features to the offsprings  c) the variations created during DNA copying are drastic and may not be influence the survival of individuals of the species  d) variations during DNA copying always ensures the maximum utilization of the niche | (1) |
| 12. | Simple diffusion cannot meet the requirements of the body in case of multicellular organisms because -  (a) the respiratory pigment is haemoglobin which prevents diffusion of oxygen.  (b) diffusion is a slow process and all the cells of the body are not in direct contact with environment  (c) diffusion is efficient in transporting the respiratory gases in few organs and not the whole body  (d) diffusion only occurs in water medium and not in multicellular organisms | (1) |
| 13. | The unit of measuring Resistivity of a material is  a) coulomb b) ohm-meter c) joule-coulomb d) joule/coulomb | (1) |
| 14. | In order to increase the strength of magnetic field at the centre of a current carrying circular coil, number of turns in the coil can be increased because:  a) current value increases b) current value decreases  c) each turn contributes to the magnetic field d)current flow becomes smoother. | (1) |
| 15. | Plants use completely different strategies for excretion than those of animals because:  (i) the excretory products constitute solid , liquid and gaseous products  (ii) most of the cells are dead in a plant body  (iii) plants are stationary and produce metabolic waste only during growth.  (iv) many plant waste products are stored in cellular vacuoles.  (a) i, ii, iii. (b) ii, iii, iv (c) i ,iii, iv (d) i ,ii, iv | (1) |
| 16. | The arteries have thick and elastic walls but veins are thin walled because  (a) arteries collect blood from different organs and bring it back to the heart .  (b) arteries carry oxygenated blood from the lungs to the heart  (c) arteries have valves that ensure that the blood flows only in one direction.  (d) arteries carry blood away from the heart to various organs of the body under high pressure. | (1) |
|  | **Q. No 17 to 20 are Assertion - Reasoning based questions.**  **These consist of two statements – Assertion (A) and Reason (R).**  **Answer these questions selecting the appropriate option given below:**   1. **Both A and R are true and R is the correct explanation of A.** 2. **Both A and R are true and R is not the correct explanation of A.** 3. **A is true but R is false.** 4. **A is False but R is true.** |  |
| 17. | **Assertion (A) :** Solder is an alloy of lead and tin.  **Reason (R) :** It has a high melting point. | (1) |
| 18. | **Assertion (A) :** Bile is an important secretion which helps in digestion of fats.  **Reason (R) :** bile has no enzyme but its effect is similar to that of emulsifying action of soaps on dirt. | (1) |
| 19. | **Assertion (A) :** When electric current flows through a thick Copper wire magnetic field is formed around it.  **Reason (R) :** Galvanometer can measure the current flowing through the wire. | (1) |
| 20. | **Assertion (A) :** Medulla of the hind brain causes reflex actions like vomiting, coughing and sneezing.  **Reason (R) :** It has many nerve cells which control involuntary actions. | (1) |
|  | **SECTION – B**  **Q. no. 21 to 26 are very short answer questions.** |  |
| 21. | A compound with the formula X2Y3 is formed by transfer of electrons from the metal X to a non-metal Y, the compound is an ore of the metal X in its  bi-hydrated form. Identify the type of bond formed in the compound and write the molecular formula of the compound. List any two properties of compound formed by such type of bond. | (2) |
| 22. | Is mucous an important secretion in the stomach? Justify your answer. | (2) |
| 23. | What would happen if the septum of the human heart is not completely formed?  **OR**  Compare the effect of root pressure and suction pressure on the ascent of sap. | (2) |
| 24. | What is meant by power of accommodation? Explain this for:  i) object nearer to eye and ii) object farther from eye  **OR**  What is meant by white light? In the spectrum name the color below red and above violet. Explain the reason for their positions. | (2) |
| 25. | State any two:  a) uses of a solenoid and  b) characteristics of magnetic field in and around a solenoid | (2) |
| 26. | “Different species use different strategies for determining their sex”. Justify | (2) |
|  | **SECTION - C**  **Q.no. 27 to 33 are short answer questions.** |  |
| 27. | 1g of copper powder was taken in a china dish and heated. What change takes place on heating? When the product of this reaction is mixed with dil. Hydrochloric acid, a visible change is observed in it. Give the chemical equation of reactions involved and mention the name and the colour of the products formed in each case. | (3) |
| 28. | What happens when :  a) sodium reacts with water  b) aluminium reacts with steam  support your answer with balanced chemical equations.  **OR**  Mention the components of the electrolysis process in the electrolytic refining of copper metal with a neat and labelled diagram and the cell reactions. | (3) |
| 29. | Draw a neat diagram of angiosperm flower and label the following parts  a) Site of pollination b) Female gamete  c) ovules d) Region which forms the fruit | (3) |
| 30. | With the help of an illustration prove that characters are segregated during gamete formation. | (3) |
| 31. | State any two :  i) sign conventions related to spherical mirrors  ii) uses convex mirror, and  iii) uses of convex lens | (3) |
| 32. | a) The refractive index of Ruby is 1.7. What is the meaning of the statement?  b) The absolute refractive indices of water and glass are 4/3 and 3/2 respectively. If speed of light in glass is 2 x 10 m/s, calculate the speed of light in (i) vacuum and (ii) water. | (3) |
| 33. | a) State: i) the rule which helps to determine the direction of magnetic field around a current carrying straight metal rod.  ii) any two characteristics of the field around the metal rod.  b)How can you enhance the strength of the magnetic field around the rod. | (3) |
|  | **SECTION - D**  **Q.no. 34 to 36 are long answer questions** |  |
| 34. | (a) Two carbon compound A and B have molecular formula C3H8 and C3H6 respectively. Which one of the two is most likely to show addition .justify your answer with the suitable equation.  (b) Explain how an addition reaction is used in vegetable ghee industry.  (c) Explain with a neat presentation the formation of nitrogen molecule with triple covalent bond.  **OR**  a) Name the given organic compound.  (i)  (ii)        (b) Identify the functional groups in the following compounds:        (c) Describe a chemical test to distinguish between ethanol and ethanoic acid. | (2)  (1)  (2)  (2)  (1)  (2) |
| 35. | a) How does a neuron cause action?  b) Summaries the events that occur in a nerve cell during transmission of messages.  c) Name the sensory receptors in tongue and nose.  **OR**  a) Chemical coordination is better than nervous coordination. Write the benefits of having both the chemical and nervous coordination.  b) Do plants also respond to the stimuli? Justify with suitable example. | (2)  (2)  (1)  (3)  (2) |
| 36. | State Ohm’s law. Explain with a suitable circuit diagram and model graph how you verify the law in your laboratory.  **OR**  a)What is meant by resistivity? State the factors on which resistivity of material of a conductor depends.  b)A conductor of a length l m and area of cross section m is stretched to twice its original length. Compare the resistances of the conductor before stretching and after stretching . | (5) |
|  | **SECTION - E**  **Q. No 37 to 39 are Case - Based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.** |  |
| 37. | Corrosion is the slow eating up of metals by the effects of atmospheric components, such as air and moisture. Silver articles become black after some time when exposed to air. This is because it reacts with Sulphur in the air to form a coating of silver sulphide. Copper reacts with moist carbon dioxide in the air and slowly loses its shiny brown surface and gains a green coating. This green substance is basic cupric carbonate. Iron when exposed to moist air for a long time acquires a coating of a brown flaky substance called rust.  i)Write a chemical reaction occur during the rusting of iron.  ii) Give two methods to prevent Iron from rusting.  iii) What is meant by the alloy? Give composition and one use of brass.  **OR**  What is Amalgam? Give one example of an amalgam and its application. | (1)  (1)  (2) |
| 38. | 1. Study the given picture and define the  process depicted.  2. Write its effect on the food chain.  3. How are human beings responsible  for this phenomenon?  4. Suggest few methods that can be  adopted to prevent it.  **OR**  Proper disposal of waste can lead to  reduction in accumulation of waste.  Comment. | (1)  (1)  (1)  (1) |
| 39. | In the figure, when ray AO enters the glass it prefers to travel in glass in the least possible time .Decidedly it takes least time if it follows path OB instead of OB’ because glass is optically denser than air and speed of light decreases in glass. It is clear that it happens when a ray strikes the interface obliquely. Thus if a ray of light strikes the interface at 900 i.e. along the normal, it has no option but to follow the same straight line path along the normal.  i) What is the basic cause of refraction of light?  ii) When will be the bending of light on refraction more?  iii) Name the optical medium in which Refraction of light is maximum? Why?  **OR**  What happens to a ray of light which strikes an interface at 900? Why? | (1)  (1)  (2) |

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