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| **SINDHI HIGH SCHOOL, BENGALURU**  **HALF YEARLYEXAMINATION [2023-24]**  **SUBJECT: SCIENCE**  **Grade**: **X** **Total marks**: **80**  **Date: 25.09.2023 Reading Time: 8:30-8:45am**  **No of Sides: 07 Writing Time: 8:45-11:45am**    **G GENERAL INSTRUCTIONS:**   * This Question Paper has 5 Sections A-E. * 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 be 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 be 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 source-based/case-based units of assessment of 04 marks each with sub-parts |

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|  | **Section A** |  |
|  | **Section A consists of 20 questions of 1 mark each.** |  |
| 1 | In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?  (a) Lead sulphate (insoluble) (b) Lead acetate  (c) Ammonium nitrate (d) Potassium sulphate | 1 |
| 2 | Rishi adds barium hydroxide to hydrochloric acid to form a white-coloured barium chloride. Which option gives the balanced chemical equation of the reaction?  (a) HCl + Ba(OH)2 → BaCl2 + 2HOH  (b) 2HCl + Ba(OH)2 → BaCl2 + 2HOH  (c) 2HCl + Ba(OH)2 → BaH2 + 2HCl + O2  (d) HCl + 2Ba(OH) → 2BaCl2 + 2HOH + O2 | 1 |
| 3 | In the reaction between MnO2 and HCl, the processes X and Y have been marked as shown in the figure below.  Identify the processes for X and Y and the substances oxidized and reduced from the table below:  (a) a (b) b (c) c (d) d | 1 |
| 4 | The calcium containing raw material used for manufacturing Plaster of pairs and bleaching powder respectively are-  (a) limestone and slaked lime (b) Slaked lime and gypsum  (c) gypsum and slaked lime (d) limestone and quick lime | 1 |
| 5 | A solution reacts with crushed egg-shells to give a gas that turns lime-water milky. The solution contains:  (a) NaCl (b) HCl (c) LiCl (d) KCl | 1 |
| 6 | An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?  (a) Baking Powder (b) Lime (c) Ammonia (d) Lemon juice | 1 |
| 7 | A solution of pH 2 is filled in two separate beakers. A few drops of methyl orange and phenolphthalein are added into separate solutions. How will the colour of the indicators change?  (a) methyl orange: red; phenolphthalein: pink  (b) methyl orange: orange; phenolphthalein: pink  (c) methyl orange: Red, phenolphthalein: colourless  (d) methyl orange: orange, phenolphthalein: colourless | 1 |
| 8 | The amount of urine excreted per day by a healthy individual depends on  (a) The metabolic activities of the cell.  (b) The water consumed by the individual  (c) The amount of water reabsorbed by the nephrons  (d) The number of physical exercises performed. | 1 |
| 9 | What would be the consequence if the water lost through the aerial parts of a plant is not replaced continuously?  (a) Increases the absorption of water in the roots  (b) Suction pressure becomes inefficient  (c) The upward movement of water through xylem becomes discontinuous affecting the growth of plants.  (d)Movement of sap through phloem increases. | 1 |
| 10 | Reflex arcs are more efficient for  (a) long lasting responses (b) quick responses  (c) Memory (d)balance of the body. | 1 |
| 11 | The following are the effects of release of adrenaline hormone during stress situations. Which of the following statements do not match the function?  (a)Heart becomes targeted and its beat increases.  (b) More amount of Oxygen is supplied to muscles.  (c)Blood from the extremities is diverted to the digestive system due to contraction.  (d) Ribs & diaphragm contract increasing the rate of breathing. | 1 |
| 12 | Regeneration is not always a method of reproduction because.  (a) All cells of an organism do not have the capacity to divide.  (b) Organisms need not depend on being cut to reproduce  (c) The regenerative cells proliferate but don’t differentiate  (d) Multicellular organisms have varied levels of organisation. | 1 |
| 13 | Two LED bulbs of 12W and 6W are connected in series. If the current through 12W bulb is 0.06A the current through 6W bulb will be :  (a) 0.04A (b) 0.06A (c) 0.08A (d) 0.12A | 1 |
| 14 | The correct pattern of magnetic field lines of the field produced by a current carrying circular loop is : | 1 |
| 15 | The expressions that relate (i) Q, I and t and (ii) Q, V and W respectively are (Here the symbols have their usual meanings): | 1 |
| 16 | In domestic electric circuits the wiring with 15A current rating for the electric devices which have   1. high power rating such as geyser 2. low power rating such as fan 3. metallic appliances and low power ratings 4. non- metallic appliances and low power ratings | 1 |
|  | **Assertion Reason based question:**  **In the following questions a statement of assertion (A) is followed by a statement of Reason(R). Choose the correct option.**  **a) Both A and R are true, and R is the correct explanation of A.**  **b) Both A and R are true, and R is not the correct explanation of A.**  **c) A is true but R is false.**  **d) A is false but R is true**. |  |
| 17 | **Assertion (A):** A reducing agent is a substance which accepts electron in a redox reaction.  **Reason (R):** A substance which helps in oxidation is known as reducing agent. | 1 |
| 18 | **Assertion (A):** Each new generation is a combination of DNA copies from 2 pre-existing individuals.  **Reason (R):** The creation of special lineage of cells having exactly half the amount of DNA results in reestablishment of number of chromosomes in new generation. | 1 |
| 19 | **Assertion (A):** Magnetic fields interact with moving charges and not with charges at rest.  **Reason (R):** Charges produce magnetic field only when they move. | 1 |
| 20 | **Assertion (A):** The flow of messages in the neuron is unidirectional.  **Reason (R):** Electrical impulses travel from the dendrite to the cell body through the axon to its end. | 1 |
|  | **Section B** |  |
|  | **Section B consists of 6 questions of 2 marks each.** |  |
| 21 | Baking soda is used in small amount in making bread and cake. It is used to make cake soft and spongy. An aqueous solution of baking soda turns red litmus blue. It is also used in soda-acid fire extinguisher.  a) How does baking soda make cake and bread spongy and soft?  b) Is the pH value of baking soda lower than or higher than 7? | 2 |
| 22 | Observe the given diagram and mention one hormone responsible for each of the given process.  stem elongation cell division  Plant hormones    wilting of leaves growth  **OR**   |  |  |  | | --- | --- | --- | | Hormone | Function | Deficiency | |  | Regulates carbohydrate, protein, and fat metabolism |  | |  |  | Dwarfism | | 2 |
| 23 | Predict the consequence if  a. Villi are not supplied with blood vessels.  b. Cows have shorter small intestine.  c. Food that enters small intestine is not acidic.  d. Mucus is absent in the stomach. | 2 |
| 24 | What is a solenoid? When does a solenoid behave as a magnet? Mention any one way to increase the magnetic field strength of this. | 2 |
| 25 | V-I graph for two conducting wires A and B are as shown. If both  wires are of the same length and same diameter, which of the two is made of a material of high resistivity? Give reason to justify your answer.  **OR**  Let the resistance of an electrical device remain constant, while the potential difference across its two ends decreases to one fourth of its initial value. What change will occur in the current through it? State the law which helps us in solving the above stated question. | 2 |
| 26 | i) What do you understand from the given pictures a, b and c.  ii) Based on pollination, how do the given specimen vary from one another. | 2 |
|  | **Section C** |  |
|  | **Section C consists of 7 questions of 3 marks each.** |  |
| 27 | You are provided with two containers made up of copper and aluminium. You are also provided with solutions of dilute HCl, dilute HNO3 , ZnCl2 and H2O. In which of the above containers these solutions can be kept? Justify. | 3 |
| 28 | (a) A salt is produced by neutralisation reaction between an acid and a base. Identify the acid and base from which the following salts have been formed:  (i) Na2SO4, (ii) NH4Cl, (iii) KNO3, (iv) NaCl  (b) Which one of these will have pH less than 7 and why?  OR  a) Explain chlor alkali process with a balanced chemical equation.  b) Name the products of Chlor Alkali process and mention one use of each of them. | 3 |
| 29 | Give one reason for the following: -  a. After ultra-filtration tubules of Kidney undergoes secretion and reabsorption.  b. Stomata open and close only during specific periods in plants.  c. From one molecule of Glucose, yeast produces ethanol, CO2, and water but Amoeba produces CO2 and water. | 3 |
| 30 | With the help of example explain the method of reproduction adopted by plants which do not bear flowers.  Write one benefit of adopting these methods in agriculture. | 3 |
| 31 | (A) In the following electric circuit, Calculate    (i) effective resistance  (ii) current through the circuit  (iii) Potential difference across 6Ω resistor  (B) (i) In the following figure, three cylindrical conductors A, B and C are shown along with their lengths and areas of cross-section.    If these three conductors are made of the same material and , and be their respective resistances, then determine which among the three has maximum resistance? Also, find the ratio. | 3 |
| 32 | (A)A straight cylindrical conductor is suspended with its axis perpendicular to the magnetic field of a horse-shoe magnet. The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the  (i) current through it is increased?  (ii) horse-shoe magnet is replaced by another stronger horseshoe magnet.  (iii) direction of current through it is reversed.  (B) Name and state the rule for determining the direction of force on a current carrying conductor in a magnetic field. | 3 |
| 33 | (A)Identify the type of current used to run microwave oven different from the one given by a car battery? Mention any two differences between the two types of current.  (B) How does an electric fuse prevent the electric circuit and the appliances from a possible damage due to short circuit or overloading? | 3 |
|  | **Section D consists of 3 questions of 5 mark** |  |
| 34 | imageIn the following schematic diagram for the preparation of hydrogen gas as shown in the figure, what would happen if the following changes were made?  a) In place of zinc granules, same amount of zinc dust is  taken in the test tube.  b) Instead of dilute sulphuric acid, dilute hydrochloric  acid is taken.  c) In place of zinc, copper turnings are taken.  d) Sodium hydroxide is taken in place of dilute  sulphuric acid and the test tube is heated. Also write the chemical equation for the reaction.  **OR**  Equal length of magnesium ribbons are taken in two test tubes A and B. HSO is added to test tube Aand HCO in the test tube **B** in equal amounts:  a) Identify the test tube showing vigorous reaction.  b) Give reason to support your answer.  c) Name the gas liberated in both the tubes. How will you prove its liberation?  d) Write chemical equations for both reactions.  e) Out of the two acids taken above.  i) Which one will have lower pH value?  ii) Which one will have lower H concentration? | 5 |
| 35 | (a)Represent the flow of blood through the human heart with the help of a neat, labelled diagram. Compare it with the heart of amphibian?  (b)Residual volume of air and respiratory pigment play a crucial role during respiration. Justify.  **OR**  Experimentally prove that plants undergo photosynthesis only in the presence of sunlight.  Photosynthesis is a vital process for all living organisms. Justify | 5 |
| 36 | Hari makes electric circuit with three bulbs of 100 W each which are connected in series to a source. Vijay makes a circuit with set of three bulbs of the same wattage which are connected in parallel across another source of same potential difference as Hari.  (i) Will the bulb in both circuits glow with the same brightness? Justify your answer.  (ii) Now, let one bulb in both the circuits get fused. Will the rest of the bulbs  continue to glow in each circuit? Give reason for your answer.  (iii) If the conductor A is made of copper and the conductor C is made of constantan (alloy of copper and nickel), then which one of the two will be suitable for heating element and why?  **OR**  A novice electrician designed the following circuit for the ‘electric wiring’ in a certain household. His senior, however, told him to make five important changes/corrections in this circuit.    Identify the five faults in the above circuit and suggest and write the corrections needed, that you think the senior electrician must have suggested to this novice. | 5 |
|  | **SECTION E consists of 3 Case study of 4 marks** |  |
| 37 | **Electrolysis**  Passing an electric current through the water, which results in the decomposition of water is called electrolysis. Electrolysis of water is carried out by adding a little amount of electrolyte in the pure water. Electrolysis of water is using electricity to split water into its constituent elements by electrolysis..  1. Name the gas collected at the anode and cathode during electrolysis of water.  2. What is the mole ratio of the gases liberated during electrolysis of water?  3. Why is the volume of gas collected at one electrode double than the other?  **OR**  What would happen if no electrolyte is added to water during its electrolysis?  Represent reduction and oxidation taking place at cathode and anode respectively using chemical equations. | 4 |
| 38 | Doctors examined an accident victim in the emergency and suggested a surgery as a part of the brain was hurt during the incident. After the surgery, doctors confirmed that the injury is not life threatening and there would be no major challenges in his future. After a few days he started complaining of loss of memory and reduced appetite.   1. Which part of the brain might be affected? 2. How is the brain protected from severe damages? 3. Is it possible that the patient can also suffer from loss of sense of touch and reflexes? Support your answer with suitable reason. 4. What would be the consequence if the patient’s medulla was affected?   **OR**  A person under the influence of alcohol cannot walk straight. Why? | 4 |
| 39 | A student places a bar magnet at the centre of a drawing board, she fixes a sheet of white paper on the magnet using some adhesive materials and sprinkles some iron filings uniformly around the bar magnet using a salt-sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.  (a) Draw diagram to show this magnetic field lines pattern of iron filings she obtained. Mark the poles as well as the direction of the magnetic field lines.  (b) How the direction of magnetic field at a point is determined using the field lines?  (c) Where is the strength of the magnetic field maximum? Justify. Also, Identify the poles P and Q of the magnets in the given diagram below.      What happens to this magnet if she suspends it freely using a string? Justify. | 4 |