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| **https://lh4.googleusercontent.com/X4uvTPCZyv9rkgd5I3QJwZM6D1Um63HA0CLQz7NA1h2CNTCb9ASJTmkdMPxDMNOYvJLO9YDEIqDoGVpTLffbnaanXcv9yTso7lx-XjYWnmAKwA3ma_VNNnnHTVll1wml_KPJl3nu**  **SINDHI HIGH SCHOOL, BENGALURU.**  **ANNUAL EXAM (2023-24)**  **CLASS: IX MARKS: 80**  **DATE: 12/2/2024 SUBJECT- SCIENCE TIME: 3 Hrs**  **ANSWER KEY** | | | | |
| **S NO.** | ***ANSWERS*** | ***MARKS*** | ***TOTAL MARKS*** |
| **SECTION A** | | | | |
| 1 | (b) IV | 1 | 1 |
| 2 | (c) (i), (iii) and (iv) | 1 | 1 |
| 3 | (b) 8 | 1 | 1 |
| 4 | (b) Sol is a solid-liquid colloid and gel is liquid-solid colloid. | 1 | 1 |
| 5 | (b) A → iii, B → iv, C → ii, D → i | 1 | 1 |
| 6 | (c) Agitating a detergent with water in a washing machine | 1 | 1 |
| 7 | (c) (NH4)2SO4 | 1 | 1 |
| 8 | (b) All of these | 1 | 1 |
| 9 | (d)  Water molecules move out of the cell based on the amount of salt in the solution. | 1 | 1 |
| 10 | (c)  Endoplasmic reticulum. | 1 | 1 |
| 11 | (c) It has a membrane-bound nucleus. | 1 | 1 |
| 12 | (c) Intercropping | 1 | 1 |
| 13 | (c) 2.4 ms-1 | 1 | 1 |
| 14 | (b)1 ms-2 | 1 | 1 |
| 15 | (b) Columnar epithelium | 1 | 1 |
| 16 | (a) (i) and (ii) | 1 | 1 |
| 17 | (c) Assertion is correct, but reason is the wrong statement. | 1 | 1 |
| 18 | (c) Assertion is correct, but reason is the wrong statement. | 1 | 1 |
| 19 | (b) Both assertion and reason are correct statements but reason is not the correct explanation for assertion. | 1 | 1 |
| 20 | (a) Both assertion and reason are correct statements, and reason is the correct explanation for assertion. | 1 | 1 |
| **SECTION B** | | | | |
| 21 | (a) The number of atoms present in one molecule of an element or a compound is known as its atomicity.  (b) (i) Octa atomic (ii) Tetra atomic. | 1  ½+½ | 2 |
| 22 | a) Leucoplast  b) Chloroplast  c) chromoplast  d) Chloroplast | 1/2x4 | 2 |
| 23 | Insect pests attack the plants in the following ways: i. They cut the root, stem and leaf. ii. They suck the cell sap from various parts of the plant. iii. They bore into stems and fruits. This way they affect the health of the crop and reduce yield. (Any two points) | 1x2 | 2 |
| 24 | When the tin can is pushed into the water keeping its mouth upwards, it displaces more volume of water, and therefore it experiences more upthrust. But when it is pushed into the water with its mouth towards water, it displaces less volume of water (as water enters it). As a result, the upthrust is also less. Thus, it is comparatively easier to push a tin can into water with its mouth towards water than away from it. | 2 | 2 |
| 25 | Chemical energy → Electrical energy → Heat energy + Light energy.  **OR**  (a) 1 Joule is the amount of work done when a force of one Newton displaces a body one meter in the direction of the force applied.  (b) When **force is applied** on an object **moves** through a distance **in the direction of application of force**. | 2 | 2 |
| 26 | The epidermis is important for the plants as it performs the following important functions:   * It protects the internal tissues from mechanical injuries. * It acts as a water-resistant layer and checks the loss of water by transpiration. * It protects the plant against the invasion of parasitic microorganisms. * It bears stomata on leaves and on young stems, which help in exchange of gases during photosynthesis and respiration. Stomata also act as sites of transpiration. * Root hairs arising from the epidermis of roots help in absorption of water and minerals from the soil. | ½x4 | 2 |
| **SECTION C** | | | | |
| 27 | (a)  *Sodium carbonate + Acetic acid → Sodium acetate + Carbon dioxide + Water*  *5.3g 6g 8.2g 2.2g 0.9g*  As per the law of conservation of mass, the total mass of reactants must be equal to the total mass of products.  As per the above reaction,  LHS = RHS i.e., 5.3g + 6g = 2.2g + 0.9 g + 8.2 g = 11.3 g  Hence the observations are in agreement with the law of conservation of mass.  (b) The molecular mass of C2H6 = (2 x 12) + (6 x 1) u  =24+6  =30u | 2  1 | 3 |
| 28 | (a) When the temperature drops from 60°C to room temperature, the solid potassium chloride will separate from the saturated solution. Temperature changes can affect solubility.  (b) Mixture consists of different components which retain their properties and can be easily separated by physical processes; hence it is called as impure substance.  (c) The homogeneous mixture of two or more metals or a metal and non-metal is called an alloy.  OR  a)    b)The boiling point of pure water is 100 °C at 1 atm. The freezing point of pure water is 0 °C. The sample of water under study boils at 102 °C at normal pressure. Hence, the sample is not pure water. The sample of water is not pure, it will not freeze at 0 °C. It will freeze at a temperature below 0 °C. | 1  1  1 | 3 |
| 29 | (a) Meristematic cells have a prominent nucleus and dense cytoplasm because they are metabolically highly active and are in continuous state of division. Meristematic cells lack vacuole because they do not store food material, waste material, sap etc.  (b) Pear fruit contains sclerenchymatous stone cells or sclereids which provide gritty texture to the fruit. Thus, when we chew pear fruit, we get a crunchy and granular feeling.  (c) Collenchyma tissue present in the branches of a tree provides flexibility to them and allows their easy bending without breaking. Thus, the branches move and bend freely in high wind velocity. | 1  1  1 | 3 |
| 30 |  | 3 | 3 |
| 31 | State The Law Of Conservation Of Mechanical Energy And Prove It In The Case  Of A Freely Falling Body | 3 | 3 |
| 32 | (a) Ship displaces more water than needle as the volume of the ship is more than that of the needle. Since upthrust depends on the volume of the object (U= Vdg), so more the volume of the object, more upthrust acts on it and the object floats.  (b) Since, pressure act on the body is inversely proportional to the surface area of contact, i.e. P is inversely proportional to A. It means that more the area of contact, less pressure will act on the body. As the broad and thick handle of our suitcase has a large area, due to which less pressure acts on our hand and it is very easy to take from one place to another. | 3 | 3 |
| 33 | (a) (i) Mitosis (ii) Mitosis (iii) Mitosis (iv) Meiosis  (b) Meiosis is the mechanism by which conservation of specific chromosome number of each species is achieved across generations in sexually reproducing organisms. Even though the process results in reduction of chromosome number by half, it is gradually conserved by union of male gamete (n) and female gamete (n) in the next generation. | 2  1 | 3 |
| **SECTION D** | | | | |
| 34 | (a) Rutherford wanted a metal sheet that could be as thin as possible for the scattering experiment. Gold is the most malleable of all the metals known to man. It’s simple to make thin sheets out of it. As a result, for his alpha-ray scattering experiment, Rutherford used gold foil.  (b) Atom (a) has zero valency because it has established a stable configuration with 8 electrons in the valence shell.  The valency of atom (b) is 1 since the valence shell contains 7 electrons. In order to obtain a stable (octet) configuration, atom (b) can take one additional electron.  (c) Helium atom has only one shell (K shell) which can have a maximum 2 electrons. Thus, its shell is already complete. It can neither lose electrons nor gain electrons. Hence, its valency is 'Zero'.  (d) (i)  is a pair of isotopes. As they have same number of protons (atomic number.) OR (a) The α-particle scattering experiment led Rutherford to the following conclusions: –  (i) Because most α-particles travelled through the gold foil with no deflection, most of the space inside the atom was unoccupied.  (ii) The positive charge occupied very little space inside the atom, as just a few particles were deviated from their route.  (iii) Only a small percentage of α-particles were deflected by 180°, implying that the positive charge and mass of the gold atom are concentrated in a compact volume within the atom.  b)   * An isotope of carbon-12, C14, is used in carbon dating. * U235 is used in the nuclear reactors to generate electricity. | 1  2  1  ½ + ½  3  2 | 5 |
| 35 | (a) (i) Limbs- Striated muscle.  Structure- Cells are long and cylindrical in shape, presence of dark and light bands, multinucleate and unbranched.  Function- Voluntary movement.  (ii) Lungs- Smooth/non-striated muscle.  Structure- Cells are spindle-shaped, absence of striation, uninucleate and unbranched. Function- Involuntary movement.  (b)    **OR**  (a) (i) Phloem  (ii) A - Sieve plate      B- Sieve tube       C- Phloem parenchyma  (iii)  Part C helps in storage of food.         Part D helps in conduction of water.  (b) | ½  1  ½  1  2  ½  ½x3  ½x2  (Any two)  1+1 | 5 |
| 36 | (a) The number of waves produced per second is called the frequency of the wave.  (b) Sound waves range from 20 Hz to 20 kHz.  (c)    **OR**  **(a) (i) (ii)**  Draw the distance-time graph for the following situations: - CBSE Class 9 -  Learn CBSE Forum Draw a distance-time graph for an object in non-uniform motion with  increasing and decreasing slope - CBSE Class 9 - Learn CBSE Forum  **(b)** | 1  1  3  1+1  3 | 5 |
|  | **Section E** |  |  |
| 37 | (a) Three beakers  (b) D  (c) The balloon has air filled in it. The balloon when kept in the sun gets heated and the air inside it also gets heated. The molecules of air get energy, and vibrate faster thereby exerting large force on the walls of the balloon. Due to this expansion of gases the balloon bursts.  **OR**  (c) Tree has a lot of leaves which constantly show transpiration. Transpiration is loss of water through small tiny pores of leaves called stomata. When this water comes on the surface of the leaf the water evaporates thereby causing a cooling effect. Therefore, we feel pleasant sitting under the tree on a hot sunny day. | 1  1  2 | 4 |
| 38 | (a) By doing mariculture or rearing marine fish.  (b)  i. High amount of fish production can be obtained by this method.       ii. Different varieties of fishes can be produced by this method.      iii. The nutrients and food present in the pond are effectively utilized in this method of fish culture.  (c) Sardines and mackerels or any other examples  **OR**  (c) Aquaculture is the cultivation of aquatic organisms (such as fish or shellfish) especially for food. | 1  (Any two)  1+1  ½x2 | 4 |
| 39 | (a) Laws of reflection: i. The angle of incidence of a sound wave is always equal to the angle of reflection of the sound wave.  ii. The incident sound wave, reflected sound wave and the normal to the reflecting surface at the point of incidence, all lie in the same plane.  (b)The conditions for an echo is that the time must be 0. 1 s and the distance of the reflecting surface from the source must be at least 17 m.  (c) Used for treating joint pains and for treating certain types of tumors for which it is desirable to produce localized heating.  Used to view uterus and ovaries during pregnancy and monitor the developing baby's health.  OR  Curved surfaces can reflect sound waves. This reflection of sound waves is used in auditorium to spread the waves uniformly throughout the hall.  Working of a stethoscope – the sound of patient’s heartbeat reaches the doctor’s ear through multiple reflections of sound. |  | 4 |