**SINDHI HIGH SCHOOL, HEBBAL**

**Half Yearly Examination [2023-24]**

**Subject: SCIENCE Answer Key**

**Class: IX Max. Marks: 80**

**Date: .09.2023**

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|  | **SECTION A** |  |
|  | MCQs |  |
| Q.NO | QUESTION | **MARKS** |
| 1 | c) Because the helium atoms are of lower mass than the average is molecules, the helium gas is less dense than air. The balloon thus weighs less than the air displaces by its volume. | **1** |
| 2 | c) It has a definite volume but not a definite shape | **1** |
| 3 | d) Evaporation, diffusion, expansion of gases | **1** |
| 4 | a) X – gas, Y – liquid, Z – solid | **1** |
| 5 | (a) X and Y (b) W and X  (c) Y and Z (d) W and Z | **1** |
| 6 | b) silicon and hydrogen | **1** |
| 7 | a) Fog | **1** |
| 8. | d) displacement = Distance = | **1** |
| 9. | c) 2 N | **1** |
| 10. | d) A, B | **1** |
| 11. | a) weight of water displaced by the solid. | **1** |
| 12. | a) 1665 | **1** |
| 13. | b) Movement of substance takes place from a region of high concentration to a region of low concentration through a semi permeable membrane. | **1** |
| 14. | c) Detoxifying many poisons and drugs | **1** |
| 15. | d) Secondary meristem | **1** |
| 16. | d) Adipose | **1** |
| 17. | c) A is true but reason R is false. | **1** |
| 18. |  | **1** |
| 19. | c) A is true but R is false. | **1** |
| 20. | b) Both A and R are true, and R is not the correct explanation of A. | **1** |
|  | **SECTION B** |  |
| 21. | Chlorine is a non-metal as it is a gas which does not conduct electricity /non-malleable/nonductile (any one)  Silver is a metal as it has lustre/conducts electricity (any one)  Sodium is a metal which conducts electricity (any one)  Carbon is anon metal which is non-malleable/non ductile (any one) | **½ x 4=2** |
| 22. | When a living plant cell loses water by exosmosis, the cell shrinks or contracts the contents the cell away from the cell wall. This phenomenon is known as plasmolysis.  They undergo deplamolysis to regain the normal shape and size.  When living plant cells undergoes endosmosis, the cell doesn’t burst but swells up, building pressure on the cell wall.  The cell wall applies equal and opposite pressure on the swelling cell, thereby helping the cells to withstand much greater changes in the surrounding medium than animal cells. | **½**  **½**  **½**  **½** |
| 23. | a. It is thicker and multi-layered in desert plants.  b. It protects the plants from infection by microbes, mechanical injury and loss of water due to presence of a waxy layer in the aerial parts of the plant called cuticle.  c. The epidermal cells have stomata in the leaves helps in transpiration and in exchange of gases.  d. The epidermal cells of the roots bear thin hair like structures called root hairs which increase the total absorptive area for absorption of water and mineral salts. | **½ x 4=2** |
| 24. | We know that F = GMm/R2as a weight of a body is the force with which a body is attracted towards the earth, ∴ W =mg= GMm/R2, M= mass of earth, m= mass of body, R= radius of earth, G= gravitational constant. According to question, If the radius of the earth (R') becomes twice of its original radius(R),  Then, New weight, W' = GMm= GMm= W  (2R)2  4R2. 4  i.e., the weight will be reduced to one-fourth of the original weight of body. | **½**  **½**  **½**  **½** |
| 25. | (i) Pα 1/A . The area of contact increases due to the continuous chain thereby reducing the pressure of the tank on the ground  (ii) P= = = 2X10-4 Pa | **1**  **½+½** |
| 26. | Draw a well labelled diagram of nucleus. | **Diagram 1**  **Labelling - ½+½** |
|  | **SECTION C** |  |
| 27 | a. Sanitizer absorbs heat from our palm for evaporation  b. Steam has more heat energy than water due to its latent heat of vaporisation and additionally latent heat of condensation.  c. The rate of diffusion of hot food is more/ kinetic energy increases with temperature. | **1**  **1**  **1** |
| 28 | a)The amount of the solute present in the saturated solution at this temperature is called its solubility.  (b) Temperature in x axis , solubility in y axis, directly proportional.    (c) mass %= X 100  X 100 = 24.24% | **1**  **1**  **(½)**  **(½)** |
| 29. | Muscle structure – muscle under the microscope — Science ...  (Note only skeletal tissue to be drawn)  The other muscular tissues are – Smooth muscle tissue – it is involuntary, have spindle shaped cells with a single nucleus.  Cardiac muscle tissue – it is involuntary, have elongated branched cells, uninucleate, striations and intercalated discs. | **Diagram 1 mark**  **½+½**  **½+½** |
| 30. | (i) a) – Mitosis b) – Meiosis  (ii) Mitosis- Equational division; daughter cells are genetically similar to the parent cell  Meiosis – Reduction division; daughter cells are not genetically similar to the parent cell.  (ii) It takes place in the body cells or somatic cells and in the reproductive cells.  (iv) If b doesn’t occur then gametes are not formed and reproduction doesn’t occur. | **½+½**  **½**  **½**  **½+½**  **1** |
| 31. | **(I)Buoyant Force:** The buoyant force is the upward force exerted by a fluid on an object submerged in it. It is equal to the weight of the fluid displaced by the object.  (ii)The weight of the object is the force due to gravity acting on the object. If the weight of the object is greater than the buoyant force, the object will experience a net downward force and will sink.  If the buoyant force is greater than the weight of the object, the object will experience a net upward force and will float.  (iii) An everyday example of this principle is a boat floating on water. The boat is designed to be less dense than the water it displaces, so the buoyant force acting on it is greater than its weight. As a result, the boat floats on the water's surface. Conversely, if you have a heavy object, such as a stone, and you place it in water, the weight of the stone is greater than the buoyant force, causing it to sink to the bottom of the water. | **1**  **½**  **½**  **1** |
| 32. | i. Speed of B = Slope of PQ = 150-100 = 25 m/s2  2-0  ii. Speed of A = Slope of OQ = 150 = 75 m/s2  2  Difference between speeds = 75 - 25 = 50 m/s  iii. The speed of both the trains is uniform as s-t graph is a straight line | **1**  **½**  **½**  **1** |
| 33. | a) i) The sheet of paper has **larger surface area** and experiences **greater air resistance during freefall**. So it falls slowly  ii) Value of ‘g’ is greater at the poles as compared to the equator because rp < req and g  b) It means that a **freely falling body accelerates at the rate of 9.8ms-2** towards the centre of the earth, during its course of fall towards the earth. | **½ + ½**  **1**  **1** |
|  | **SECTION D** |  |
| 34 | (a) (i) Rahul  Total weight of solution = 10+100=110g  Mass percentage = 10x 100/110 = 9.09%  (ii) Priya  Total weight of solution = 100g  Mass percentage = 10x 100/100 = 10%  (b) Solvent is water, solution is sodium chloride, suspension is sand grains, colloid is clay particles which cannot be filtered  (c) (i)A solution of Potassium chloride prepared at 60oC crystallises when allowed to cool at room temperature.  (ii) The path of light is not visible. Or it does not show Tyndall effect. | **½**  **½**  **½**  **½**  **½ x 4=2**  **½**  **½** |
| 35. | . (i) A – Stratified squamous epithelium – It helps prevent wear and tear.  B – Bone cells – Provide a place for muscles to get anchored; protects and supports the vital organs of the body.  (note - Identification + function **½** mark each)  (ii) Connective tissue are made of different types of cells; the cells are loosely spaced and are embedded in an intercellular matrix; it connects the different parts of the body,etc  Nervous tissue are made up of nerve cells called neurons; they help transmit messages across the body in the form of nerve impulses.  (note – any two appropriate points each can be written for the above)  (iii) Cuboidal epithelium – provides mechanical support, in absorption, secretion & excretion  File:Simple cuboidal epithelium.svg - Wikimedia Commons | ½+½  ½+½  ½+½  ½+½  ½  ½ |
| 36. |  |  |
|  | **SECTION E** |  |
| 37 | **Ans : (i) K= oC+273**  **= 100+273 = 373 K**  **(ii) The amount of heat required to change 1 g of a solid completely into its liquid state at its melting point.**  **(iii) a) at 0°C, physical state of water is both liquid and solid.**  **b) at 100°C, physical state of water is both liquid and gas(vapour).**  **(iv) The intermolecular spaces between the particles are largest in a gas, because of which they move randomly with very high speeds. Hence a gas diffuses faster than a liquid.** | ½  ½  1  ½  ½  ½  ½ |
| 38. | (i) (c) Mitochondria  (ii) (b) Chromoplasts  (iii) (d) Plastids are present only in animal cell.  (iv) (b) Chloroplasts | 1  1  1  1 |
| 39. | 1. Newton's first law of motion, often referred to as the law of inertia, states that an object in motion tends to stay in motion unless acted upon by an external force. In the context of the car coming to a stop, even after the brakes are applied, the car tends to continue moving forward due to its inertia.  2. When the driver applies the brakes, the tires exert a backward force on the road (action). According to Newton's third law, the road exerts an equal and opposite forward force on the tires (reaction). This frictional force between the tires and the road is what allows the car to decelerate and eventually come to a stop.  3. When the brakes are applied, they generate a backward force (opposite to the car's direction of motion). This force causes the car to decelerate. The greater the force applied by the brakes, the greater the deceleration. Conversely, a heavier car (greater mass) requires more force to decelerate at the same rate. | **1** |