 **SINDHI HIGH SCHOOL, BENGALURU**

**HALF YEARLY EXAMINATION [2023-24]**

**Subject: SCIENCE**

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

**Duration : 3 hrs 15 mins**

**Date: 05.10.2023 Reading time: 15 mins**

**No. of sides: 7 Writing time : 3 hrs**

**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.

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** |  |
| **Q. NO** | **Section A consists of 20 questions of 1 mark each.** | **MARKS** |
| **1)** | Which of the following statements best explains why a closed balloon filled with helium gas rises in air?  a) Helium is a mono-atomic gas, whereas nearly all the molecules that make up air, such as nitrogen and oxygen, are diatomic.  b) The average speed of helium atoms is higher than the average speeds of air molecules, and the higher speed of collisions with the balloon walls propels the balloon upward.  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.  d) Because the helium atoms are in faster motion. This means that they have higher kinetic energy and more temperature. Hot gases tend to rise. | **1** |
| **2)** | Which of the following describes the liquid phase?  a) It has a definite shape and a definite volume  b) It has a definite shape but not a definite volume  c) It has a definite volume but not a definite shape  d) It has neither a definite shape nor a definite volume | **1** |
| **3)** | Which one of the following sets of phenomena would increase on raising the temperature?  a) Diffusion, evaporation, compression of gases  b) Evaporation, compression of gases, solubility  c) Evaporation, solubility, diffusion, compression of gases  d) Evaporation, diffusion, expansion of gases | **1** |
| **4)** | The image shows three substances that can change from one physical state to another by different processes.    What are X, Y, and Z?  a) X – gas, Y – liquid, Z – solid  b) X – liquid, Y – solid, Z – gas  c) X – gas, Y – solid, Z – liquid  d) X – solid, Y – gas, Z – liquid | **1** |
| **5)** | A student listed some mixtures and classified them into various types. As mentioned in the table :  Which mixtures are classified correctly?  a) X and Y b) W and X  c) Y and Z d) W and Z | **1** |
| **6)** | Ankita listed some items as shown in the picture. Which of these substances cannot be broken into simpler substances?  a) methane and silicon  b) silicon and hydrogen  c) acetic acid and hydrogen  d) methane and acetic acid | **1** |
| **7)** | The Colloidal mixture with the dispersed phase and dispersing medium as liquid and gas respectively from the following examples can be:  a) Fog b) Cheese c) Coloured gemstone d) foam | **1** |
| **8)** | A body moves on three - quarters of a circle of radius r. The displacement and distance travelled by it  a) displacement = 0, distance =  b) displacement = r, distance = 3r  c) distance = 2r, displacement =  d) displacement = Distance = | **1** |
| **9)** | An object weights 10 N in air. When immersed fully in water, it weighs only 8 N. The weight of the liquid displaced by the object will be  a) 12 N b) 8 N c) 2 Nd) 10 N | **1** |
| **10)** | The two states of motion treated alike by Newton’s first law, among A, B, C, and D are A : Rest, B: Uniform motion, C: Uniformly accelerated, D: Non -uniformly accelerated  a) A, D b) A, C c) B, C d) A, B | **1** |
| **11)** | While performing an experiment a solid was immersed fully in water and it was observed that the solid has suffered an apparent loss in its weight. This apparent loss in weight of the solid must be equal to the:  a) weight of water displaced by the solidb) weight of the solid in water  c) weight of the solid in air d) weight of water filled in the vessel | **1** |
| **12)** | With the help of a self-designed microscope, Robert Hooke observed cork cells in the year  a) 1665 b) 1675 c) 1685 d) 1695 | **1** |
| **13)** | Osmosis is a special case of diffusion because  a) Movement of substance takes place from a region of high concentration to a region of low concentration through permeable membrane.  c) Movement of substance takes place from a region of high concentration to a region of low concentration through a semi permeable membrane.  c) Movement of substance takes place from a region of low concentration to a region of high concentration through a semipermeable membrane  d) Movement of substance takes place from a region of low concentration to a region of high concentration through permeable membrane. | **1** |
| **14)** | In the liver cells of vertebrates SER plays a crucial role in  a) Producing pigments b) Inhibiting the production of bile  c) Detoxifying many poisons and drugs d) Expelling excess water from the cell. | **1** |
| **15)** | The cell wall of cork comprises of suberin, so that they are impervious to water, these cells are dead and are produced by  a) Permanent tissues b) Vascular tissues c) Epidermis d) Secondary meristem | **1** |
| **16)** | Which among the following tissue acts as an insulator  a) Areolar b) Lymph c) Blood d) Adipose | **1** |
|  | **Assertion Reason based questions:**  **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):** Colloidal solutions are stable in nature.  **Reason (R):** Colloidal particles settle down in the bottom of a container when left undisturbed for some time as they are heterogeneous mixtures. | **1** |
| **18)** | **Assertion (A):** The central vacuole of some plant cells may occupy 50% - 90% of the cell volume.  **Reason (R):** In some unicellular organisms like Amoeba there are two types of vacuoles present, one for digestion and other for expelling waste. | **1** |
| **19)** | **Assertion (A):** Inertia is that property of the body due to which it resists a change in its state of rest or of uniform motion.  **Reason (R):** Heavy objects have less inertia than lighter objects. | **1** |
| **20)** | **ASSERTION(A) :** The functional combination of nerve and muscle enables animals to move rapidly in response to stimuli  **REASON(R):** Many nerve fibres bound together by connective tissue make up a nerve. | **1** |
|  | **SECTION B** |  |
|  | **Section B consists of 6 questions of 2 marks each.** |  |
| **21)** | From the list given below identify the metals and non-metals and state the property on the basis of which you make your choice  Chlorine, silver, sodium, carbon | **2** |
| **22)** | How does the cell wall protect the cell in various media? Explain in detail | **2** |
| **23)** | Apart from being a protective layer Epidermis plays many other roles. Justify. | **2** |
| **24)** | Suppose that the radius of the earth becomes twice of its original radius without any change in its mass. Then what will happen to your weight? | **2** |
| **25)** | Main battle tank - Wikipedia  Observe the diagram and explain why should army tank weighing a thousand tonne rest upon continuous chain  (ii) Find pressure, when a thrust of 20N is applied on a surface area of 10cm2. | **2** |
| **26)** | Draw a neat labelled diagram of the double membrane spherical shaped cell organelle which can be viewed clearly under the compound microscope stained with safranin or methylene blue. | **2** |
|  | **SECTION C** |  |
|  | **Section C consists of 7 questions of 3 marks each.** |  |
| **27)** | Account for the following observations:  (a) On cleaning with sanitizer, our palm feels cold .  (b) Steam causes severe burns  (c) The smell of hot cooked food reaches us in seconds | **3** |
| **28)** | Observe the data provided to answer the questions.  a) Define solubility.    b) Plot a graph representing the variation of solubility with temperature.  c) Calculate the mass by mass percentage of the solution at 293K.  **In 100g of water** | **3** |
| **29)** | Draw the tissue which is made up of contractile proteins and explain how it is structurally different from its similar group of tissues. | **3** |
| **30)** | Observe the given picture and answer the following:-  a b  1,200+ Meiosis Stock Photos, Pictures & Royalty-Free Images - iStock |  Mitosis meiosis, Meiosis i 1,200+ Meiosis Stock Photos, Pictures & Royalty-Free Images - iStock |  Mitosis meiosis, Meiosis i  i) Identify a & b  ii) Give any one difference between a & b.  iii) Where does a & b take place?  iv) What would happen if ‘b’ doesn’t occur? | **3** |
| **31)** | (i)What is buoyant force?  (ii)Explain how the buoyant force and the weight of an object submerged in a fluid determine whether the object will float or sink.  (iii)Provide an example of an everyday object that demonstrates this principle. | **3** |
| **32)** | imageThe distance - time graph of the two trains is shown in the figure. The trains start simultaneously in the same direction.   1. What is the speed of B? 2. What is the difference between speeds of A and B? 3. Is the speed of both the trains uniform or   non - uniform? Justify your answer. | **3** |
| **33)** | a) Give reason for the following  i. A sheet of paper falls slower when it is opened than when it is crumpled into a  ball  ii. A body weighs more at the poles tan at equator  b) What is meant by the statement that acceleration due to gravity is 9.8ms-2 | **3** |
|  | **SECTION D** |  |
|  | **Section D consists of 3 questions of 5 marks each.** |  |
| **34)** | a) During an experiment the students were asked to prepare a 10% (mass/mass) solution of salt in water .Rahul dissolved 10g of salt in 100g of water while Priya prepared it by dissolving 10g of salt in water to make 100g of solution. Calculate mass by mass % in each case.  b) Rain water which contains sand grains, clay particles which cannot be filtered, pieces of paper, bubbles of air is stored in a tank containing traces of sodium chloride. Select an example each of a solvent, solution, suspension, and colloid from the above.  c) Write your observations when  (i) A solution of Potassium chloride prepared at 60oC is allowed to cool at room temperature.  (ii) A beam of light is passed through sugar solution | **2+2+1** |
| **35)** | i) Give any two functions of A and B of the given two diagrams.  SUBJECT – BIOLOGY CLASS - IX CHAPTER – TISSUE (Notes) CLASSIFICATION OF  ANIMAL TISSUES Epithelial Tissue Types of Epitheli A Definition Of Connective Tissue Class 9 B  ii) Give any two differences between connective tissue and nervous tissue.  iii) Draw the type of epithelial tissue present in kidney tubules and ducts of salivary glands and write their function. | **2+2+1** |
| **36)** | The velocity - time graph of an object of mass m = 50 g  image is shown in the figure. Observe the graph carefully and  answer the following questions.  i) Calculate the force on the object in time  interval 0 to 3 s.  ii) Calculate the force on the object in the time  interval 6 to 10 s.  iii) Is there any time interval in which no force  acts on the object? Justify your answer. | **5** |
|  | **SECTION E** |  |
|  | **Section E consists of two Case study of 4 marks** |  |
| **37)** | Temperature can be expressed in three important scales. These are Celsius scale (oC), Fahrenheit scale (oF) and Kelvin scale (K). Kelvin scale is often used to express temperature in scientific data. The temperature of any system during phase change remains constant.  i) Calculate the boiling point of water in Kelvin scale?  ii) Define latent heat of fusion.  iii) What is the physical state of water at -  (a) 0°C (b) 100°C  iv) Which of the two diffuses faster: a liquid or a gas? State the reason. | **4** |
| **38)** | Plastids are of different types. Leucoplasts are colourless plastids. They store starch, oil, proteins. Chromoplasts are coloured plastids. They contain pigments. e.g. Chloroplasts contain green pigment Chlorophyll. The internal organisation of the chloroplast consists of numerous membranous layers embedded in a material called the stroma which helps perform functions that are essential for the survival of living organisms.  **(i)** Which are the plastids that are present mostly in the underground parts of the plants like roots, underground stems, etc. Mention one characteristic function of them.  **(ii)** Plastids share some common characters with which organelle of the cell? Write those characters.  **(iii)** Which of the following statement is not true?  a) Plastids are present in Photosynthetic and non-photosynthetic regions of plants. b) Plastids are absent in animal cell. c) Plastids are present only in plant cell. d) Plastids are present only in animal cell. | **4** |
| **39)** | A car travelling on a straight road suddenly comes to a stop. The driver applied the brakes to avoid colliding with an obstacle that appeared suddenly in front of the car. Analyse this situation using the concepts of Newton’s laws of motion and explain the following:   1. According to Newton’s first law of motion, explain why the car tends to continue moving forward even after the brakes are applied. 2. Use Newton’s third law of motion to explain the interaction between the car’s tires and the road during the braking process. 3. Describe how Newton’s second law of motion relates to the deceleration of the car when the brakes are applied. | **4** |