SET NO. 1

ROLL NO.: | | | | | | | |

Candidates must write the Set No. on the title page of the answer book.

DAV PUBLIC SCHOOLS, ODISHA ZONE
PERIODIC ASSESSMENT-II (2023-24)

- Check that this question paper contains **8** printed pages.
- Set number given on the right hand side of the question paper should be written on the title page of the answer book by the candidate.
- Check that this question paper contains **39** questions.
- Write down the Serial Number of the question in the left side of the margin before attempting it.
- 15 minutes cooling time has been allotted to read this question paper only and do not write any answer on the answer book during this period

CLASS-IX
SUBJECT: SCIENCE (086)

Time Allowed: 3Hours **Maximum Marks: 80**

General Instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 objective type questions carrying 1 mark each.
iv. 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.
v. 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.
vi. 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.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

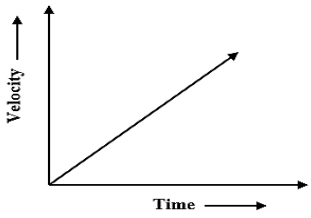
SECTION-A

Select and write the most appropriate option out of the four options given for each of the questions 1-20.

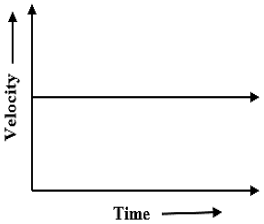
1. A car is travelling at a speed of 90 km/h. Brakes are applied so as to produce a uniform acceleration of $-0.5\ m/s^2$. Find how far the car will go before it is brought to rest. 1
   (a) 8100 m
   (b) 900 m
   (c) 625 m
   (d) 620 m

2. Sweety swims in a 90m long pool from one end to another and back. Her average velocity is
   (a) Zero 1
   (b) 180m/s
   (c) 90m
   (d) 2m/s

3. Choose the correct velocity-time graph of a moving particle on which net external force acting is zero. 1



(a)



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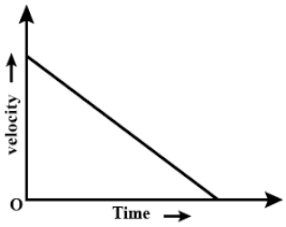

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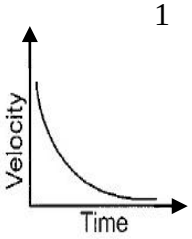
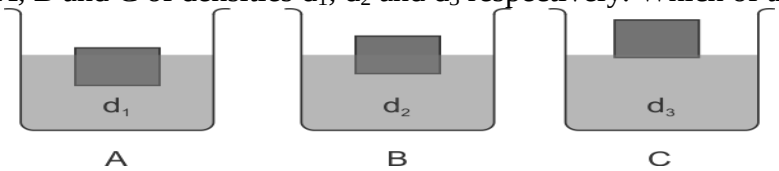


(d)

4. Area under a v-t graph represents a physical quantity which has the unit 1
   (a) m^2
   (b) m
   (c) m/s^2
   (d) m/s

5. In collision between a heavier body and a lighter body 1
   (a) both experiences the same force
   (b) both undergo same change in momentum
   (c) lighter body is likely to be damaged more than the heavier body
   (d) all the above

6. The following figure shows three identical blocks of wood floating in three different liquids A, B and C of densities d_1, d_2 and d_3 respectively. Which of these has the highest density? 1



   (a) Liquid A
   (b) Liquid B
   (c) Liquid C
   (d) All the three liquids

7. The boiling point of alcohol is 78°C. What is this temperature in Kelvin scale? 1
   (a) 373 K
   (b) 351 K
   (c) 375 K
   (d) 78 K

8. Two substances, A and B were made to react to form a third substance, A_2B according to the following reaction 1

$$2A + B \rightarrow A_2B$$

Which of the following statements concerning this reaction are incorrect ?
   (i) The product A_2B shows the properties of substances A and B.
   (ii) The product will always have a fixed composition.
   (iii) The product so formed cannot be classified as a compound.
   (iv) The product so formed is an element

   (a) (i), (ii) and (iii)
   (b) (ii), (iii) and (iv)
   (c) (i), (iii) and (iv)
   (d) (ii) and (iv)

9. White gold is used in jewelry and contains two elements, gold and palladium. A jeweler has two different samples that are both identical in appearance and have a uniform composition throughout. Identify the correct statement about the samples. 1

(a) They are homogeneous mixtures and are classified as metallic alloys.
(b) The materials are heterogeneous mixtures and can be classified by their components.
(c) The samples have variable compositions and are classified as metallic solutions.
(d) The samples are heterogeneous mixtures that can be separated using magnetic properties.

10. Rusting of an article made up of iron is called 1

(a) corrosion and it is a physical as well as chemical change
(b) dissolution and it is a physical change
(c) corrosion and it is a chemical change
(d) dissolution and it is a chemical change

11. Which among the following is not a postulate of Dalton's atomic theory? 1

(a) Atoms cannot be created or destroyed.
(b) Atoms of different elements have different sizes, masses and chemical properties.
(c) Atoms of a given element are not identical in mass and chemical properties.
(d) Atoms are very tiny particles which cannot be further divided.

12. During the decomposition of water by passing electricity, 36g of water produce 4g of hydrogen gas. Then predict the mass of oxygen gas produced. 1

(a) 30g
(b) 31g
(c) 16g
(d) 32g

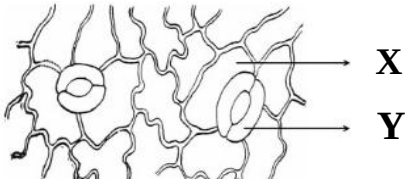
13. Rahul puts four raisins in two beakers, A and B. Beaker A contains 50 ml of distilled water and beaker B contains 50 ml of saturated sugar solution. After some time he would observe that 1

(a) raisins in beaker A are more swollen than those in beaker B
(b) raisins in beaker B are more swollen than those in beaker A
(c) raisins in both beakers A and B are equally swollen
(d) raisins in beaker A do not swell up at all.

14. Lignified or thickened cell wall is a characteristic feature of 1

(a) Collenchyma
(b) Sclerenchyma
(c) Parenchyma
(d) Phloem

15. From the diagram given below identify X and Y. 1



(a) X-Cork Y-Guard cell
(b) X- Epidermal cell Y-Stomata
(c) X- Epidermal cell Y- Guard cell
(d) None of the above.

16. A nail is inserted in the trunk of a tree at a height of 1m from the ground level. After 3 years the nail will 1
    (a) move downwards
    (b) move upwards
    (c) remain at the same position
    (d) move sideways

Question No. 17 to 20 consist of two statements Assertion (A) and Reason (R).
Answer these questions selecting the appropriate option given below:
(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:** Delicate materials are having soft packing. 1
    Reason: Soft packing decreases the time of impact so as to increase the rate of change of momentum.

18. **Assertion:** It is easier to cook food at sea level as compared to higher altitudes. 1
    Reason: The boiling point of water increases at high altitudes.

19. **Assertion:** When a beam of light is passed through a colloidal solution placed in a dark place the path of the beam becomes visible. 1
    Reason: Light gets scattered by the colloidal particles.

20. **Assertion:** Osmosis is movement of water from its higher concentration to the area of lower concentration. 1
    Reason: A semipermeable membrane is seldom required for it.

SECTION- B
Question No. 21 to 26 are very short answer questions.

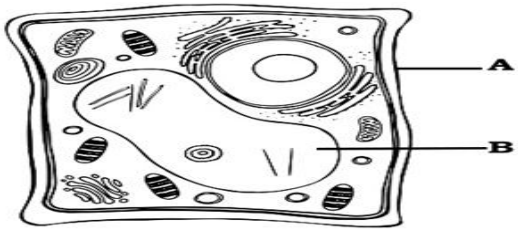
21. (a) When a galloping horse stops suddenly, what happens to the rider and why?
    (b) It is difficult for a fireman to hold a hose, which ejects large amount of water at a high velocity. Give reason. 2

22. Nitrogen and hydrogen combine in the ratio of 14:3 by mass to form ammonia.
    Calculate the mass of nitrogen gas would be required to react completely with 9g of hydrogen gas. State the law of chemical combination applied in the above case. 2

23. (a) Write the action of lysosome towards the foreign materials entering the cell.
    (b) Mention the importance of smooth endoplasmic reticulum in the liver cells of vertebrates. 2

24. The shell of an egg can be removed by dissolving in solution X. 2
    (a) Identify X.
    (b) State your observation when a de-shelled egg is placed in a concentrated salt solution.

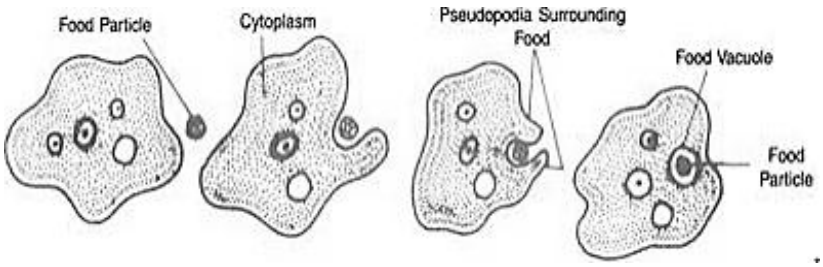
25. The picture given below represents the diagram of a plant cell under compound microscope. 2



(a) Identify the labelled part A and B from the above diagram.
(b) Write one important function of each labelled part A and B in the above diagram.

OR

(a) Identify the process undergoing in the given diagram and define it.
(b) The process given below is not found in plants. Why?



26. **'A'** is the outer covering of a plant that is usually made of a single layer of cells. **'B'** are the small pores on **'A'**. Recognize **'A'** & **'B'**. Also state any one role of **'B'** in plants. 2

OR

Name two special types of parenchyma tissue. Mention their specific roles in plants.

SECTION- C
Question No. 27 to 33 are short answer questions.

27. A bullet of 10 g strikes a sand bag at a speed of 10^3 m/s and gets embedded after travelling 5 cm. Calculate 3
(a) the resistive force exerted by the sand on the bullet.
(b) the time taken by the bullet to come to rest.

OR

A bullet of mass 10 g travelling horizontally with a velocity of 150 m/s strikes a stationary wooden block and comes to rest in 0.03 s. Calculate the distance of penetration of the bullet into the block. Also calculate the magnitude of the force exerted by the wooden block on the bullet.

28. (a) State Archimedes' principle.
(b) Give two applications of Archimedes' principle.
(c) An object weighs 15 N in air. When immersed fully in water, it weighs only 13 N. Find the weight of the liquid displaced by the object. 3

29. (a) The weight of a body on the surface of the earth is 392 N. Calculate the weight of the body on a planet whose mass is two times the mass of the earth and radius is four times the radius of the earth.
(b) How is pressure related to the thrust? Write the SI unit of pressure. 3

30. (a) Distinguish between evaporation and boiling. (any two)
(b) People perspire a lot on a hot humid day. Give reason. 3

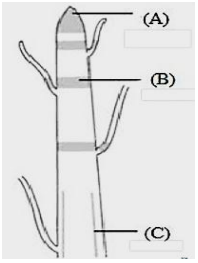
OR

(a) Why does the temperature remain constant during the change of state of matter?
(b) Ice and water both co-exist together at 273K. Which of these two will have more cooling effect? Justify your answer.

31. (a) Classify the following as true solution, colloid and suspension.
milk, coloured gemstone, tincture of iodine, soil in water
(b) Mention the dispersed phase and dispersing medium in aerosol. 3

32. (a) List two similarities between mitochondria and plastids.
(b) Viruses do not show characteristics of life until they enter a living body. Explain. 3

33. Obseve the location of meristematic tissue in plant body given below and identify A, B & C. State the function of each of the identified parts. 3



SECTION- D
Question No. 34 to 36 are long answer questions.

34. (a) The gravitational force between two objects is 200N. How should the distance between the objects be changed so that force between them becomes 100 N?
(b) An apple attracts the earth and the earth also attracts the apple towards its centre. Then, why only apple falls towards the earth but earth is not moved towards the apple?
(c) A stone is thrown vertically upward with an initial velocity of 40 m/s. Taking $g = 10\ m/s^2$, find the maximum height reached by the stone. Calculate the net displacement and the total distance covered by the stone**.** 1+2+2

OR

(a) A ball is thrown up vertically returns to the thrower after 8s. Find
(i) the velocity with which it was thrown up,
(ii) the maximum height it reaches, and
(iii) its position after 5s.
(b) Write importance of the universal law of gravitation. (Any two) 3+2

35. (a) Calculate the amount of ammonium chloride required to prepare a solution of 15% concentration (mass by mass percentage) in 120g of water.
(b) What would you observe when
(i) a saturated solution of potassium chloride prepared at 60°C is allowed to cool to room temperature?
(ii) a mixture of iron filings and sulphur powder is heated strongly?
(c) You are given two samples of water labelled as 'A' and 'B'. Sample 'A' boils at 100°C and sample 'B' boils at 102°C. Which sample of water will not freeze at 0°C? Comment. 2+2+1

OR

Sudha tested the solubility of four salts X, Y, Z and T at different temperatures and collected the following data. (Solubility refers to the amount of salt in grams dissolved in 100 g of water to give a saturated solution.) 1+2+1+1

Salt dissolved	Temperature in Kelvin				
	290 K	313 K	323 K	343 K	353 K
	Solubility				
X	22	34	40	93	109
Y	43	43	46	50	50
Z	27	30	34	37	40
T	25	38	42	54	64

Answer the following questions from the table:

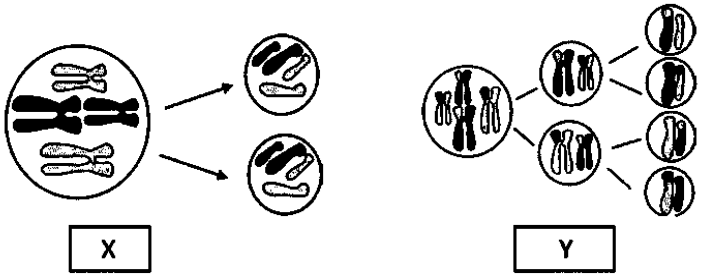
(a) Identify the salts having the highest and lowest solubility at 323 K.

(b) A student prepared a saturated solution of X at 323 K and then added 25 g water to it. What mass of X must be added again to make the solution saturated?

(c) Find the mass of T required to make saturated solution in 200 g of water at 290 K.

(d) Define a super saturated solution.

36. Observe the figure given below and answer the followings. 1+1+3



(a) Mention the type of cell division found in X and Y.

(b) Which type of cell division is required for the formation of gametes? What happens to chromosome numbers of the newly produced daughter cells during this cell division?

(c) In brief state what happens when

(i) a red blood cell is kept in concentrated saline solution?

(ii) the Plasma-membrane of a cell breaks down?

(iii) onion scale leaves are boiled in water first and then a drop of sugar syrup is put on it?

SECTION- E

Question No. 37 to 39 are case-based/source -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. The speed of an object is the distance covered per unit time and velocity is the displacement per unit time. To specify the speed of an object, we require only its magnitude while velocity is the speed of an object moving in a definite direction. The speed of an object need not be constant. In most cases, objects will be in non-uniform motion. Therefore, we describe the rate of motion of such objects in terms of their average speed. The rate of change of velocity of an object is called acceleration. 1+1+2

(a) Write one difference between uniform linear motion and uniform circular motion.

(b) State the numerical ratio of average velocity to average speed of an object moving along a straight line path.

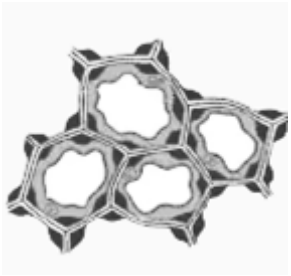
(c) The brakes applied to a car produce an acceleration of 6 m/s^2 in the opposite direction to the motion. If the car takes 2 sec to stop after the application of brakes, calculate the distance it travels during this time.

OR

(c) The average speed of a person in driving to school is 30 km/h. On the return trip along the same route, the average speed is 25 km/h. Calculate the average speed of the round trip.

38. Permanent tissues may be defined as a group of living or dead cells formed by meristematic tissue and have lost their ability to divide and have permanently placed at fixed positions in the plant body. Meristematic tissues take up a specific role and lose the ability to divide. This process of taking up a permanent shape, size and function is called differentiation. Cells of meristematic tissue differentiate to form different types of permanent tissues.1+1+2

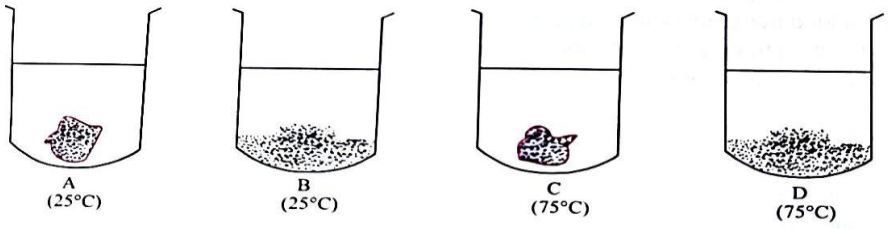
(a) Water hyacinth floats on water surface. Justify.
(b) It is difficult to pull out the husk of a coconut tree. Give reason.
(c) Identify the tissue shown below and list its function in plants.



OR

(c) State any two characteristics of meristematic tissues.

39. In certain investigatory project, 200 ml of water is taken in each of the four beakers A, B, C and D. Beaker A and B are maintained at 25^0C while C and D are maintained at 75^0C. Four crystals of copper sulphate of approximately same mass are taken and two of them are ground to powder form. Now, crystals are added in beaker A and C while powdered forms of the salt are added to B and D. 1+1+2



(a) In which beaker out of A, B, C and D intermixing will be quickest?
(b) Compare the rate of intermixing in beaker A and C.
(c) How does the rate of diffusion affected with the change in temperature? Give reason.

OR

(c) (i) Compare the rate of diffusion in three states of matter in the increasing order.
(ii) Write two characteristics of particles of matter on which rate of diffusion depends.

* * *