HALF YEARLY EXAMINATION, 2024-25

SCIENCE

Time – 3:00 Hrs. **Class – IX** **M.M. : 80**

Date – 14.09.2024 (Saturday)

Name of the student _____Section _____

General Instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, internal choices are provided in some questions. A student is expected to attempt only one of choice.
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.
v. **Section C** consists of 7 Short Answer type questions carrying 03 marks each.
vi. **Section D** consists of 3 Long Answer type questions carrying 05 marks each.
vii. **Section E** consists of 3 source-based/case-based questions of 04 marks each with sub-parts.

SECTION - A

Q.1 The inertia of an object causes the object to 1

a) decrease its speed b) Increase its speed

c) resist any change in the state of its motion d) decelerate due to friction

Q.2 Which of the following is the SI units of momentum? 1

a) $Kgms^{-1}$ b) $Kgms^{-2}$ c) Newton – Meter d) Newton/meter

Q.3 If an object of mass 5 kg moves with velocity 2 m/s, its momentum will be: 1

a) 5 kgm/s b) 2 kgm/s c) 2.5 kgm/s d) 10 kgm/s

Q.4 Which of the following statements is true of the value of acceleration due to gravity? 1

a) The value is the same on the equator and poles

b) The value is least on the poles

c) The value is least on the equator

d) The value increases from pole to equator

Q.5 Keeping the masses constant if we double the distance between two bodies, then the force of attraction between them: 1

a) Becomes double b) Becomes half c) Increases 4 times d) Decreases 4 times

Q6. Cell arises from pre-existing cell was stated by : 1

a) Haeckel b) Virchow c) Hooke d) Schleiden

Q.7 Plasmolysis in a plant cell is defined as – 1

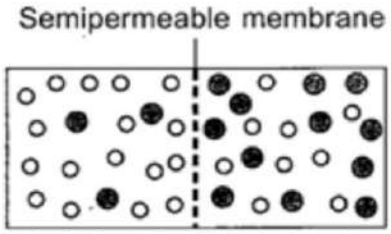
a) breakdown(lysis) of plasma membrane in hypotonic medium.

b) shrinkage of cytoplasm in hypertonic medium.

c) shrinkage of nucleoplasm.

d) none of these

Q8. Study the given figure carefully. In which direction the net movement of water will take place ? 1



[Key : ○ Water molecule; ● Solute molecule]

a) From solution 1 to solution 2 b) From solution 2 to solution 1

c) Both (a) and (b) d) No movement will take place

Q9. Which of the following are covered by a single membrane? 1

a) Mitochondria b) Vacuole c) Plastid d) None of these

Q10. Meristematic tissues are those which help in increasing the length and girth of the plant. Which of the following statements given below is correct about the meristematic tissue? 1

(a) It is made up of cells that are incapable of cell division.

(b) It is made up of cells that are capable of cell division.

(c) It's cell contains large vacuole.

(d) It is composed of more than one type of cells.

Q11. Xylem is the specialized tissue of the plants that transports water and nutrients from the soil to the upper parts like stems and leaves of plant and provides mechanical support to them. It is composed of four different types of the cells. Which of the following is not one a type of cell found in xylem tissues? 1

(a) Tracheid (b) Vessels (c) Xylem parenchyma (d) Sieve tubes

Q12. If the tip of the sugarcane plant is removed from the field, even then it keeps on growing in length. It is due to the presence of: 1

(a) Cambium (b) Apical meristem (c) Lateral meristem (d) Intercalary meristem

Q13. In which of the following conditions, the distance between the molecules of hydrogen gas would increase? 1

(i) Increasing pressure on hydrogen contained in a closed container.

(ii) Some hydrogen gas leaking out of the container.

(iii) Increasing the volume of the container of hydrogen gas.

(iv) Adding more hydrogen gas to the container without increasing the volume of the container.

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

Q14. White gold is used in jewellery and contains two elements, gold and palladium. A jeweller has two different samples that are both identical in appearance and have a uniform composition throughout. What can be said about the samples? 1

(a) They are homogeneous mixtures and be 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.

Q15. Two substances A and B when bought together form a substance C with the evolution of heat. The properties of C are entirely different from those of A and B. The substance C is: 1

(a) A compound (b) An element (c) A mixture (d) None of these

Q16. Among the substances ,choose the correct sequence of element , compound and mixture- 1

a) Brass, lime stone and Diamond b) Diamond, Brass and limestone

c) Diamond, limestone and Brass d) limestone, Diamond and Brass

Q17. Which condition out of the following will increase the evaporation of water? 1

a) Increase in temperature of water. b) Decrease in temperature of water.

c) Less exposed surface area of water. d) Adding common salt in water.

In Q. no. 18 to 20, a statement of Assertion is given followed by a corresponding statement of Reason just below it. Of the statements given below, mark the correct answer as -

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Assertion is false but reason is true

Q18. **Assertion :** Permanent tissues are derived from meristematic tissue when they lose the ability to divide. 1

Reason : Meristematic tissue is the dividing tissue in the growing region of Plants

Q19. **Assertion :** An object may acquire acceleration even if it is moving at a constant speed. 1
Reason : With change in the direction of motion, an object can acquire acceleration.

Q20. **Assertion** - Oxygen atom is pure substance. 1

Reason - Oxygen is always found in combined state.

SECTION - B

Q21. Give scientific reason for the following : 2

(a) Inner membrane of mitochondria is deeply folded.

(b) Mitochondria are able to make some of their proteins.

OR

Differentiate between nucleus and nucleoid. (Any two points)

Q22. Give reasons : 2
We get a crunchy and granular feeling, when we chew pear fruit.

Q23. The brakes were applied in a car travelling with a velocity of 15 m/s and it stops in 5 sec. Find the acceleration of the car in the interval. 2

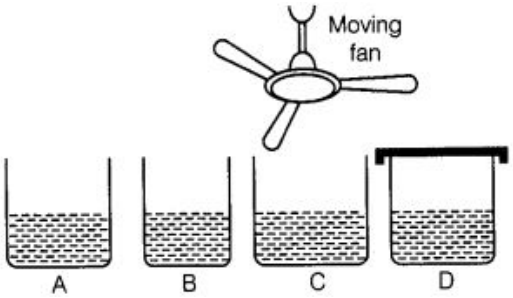
OR

Draw the V – T graph of a car moving with uniform velocity 5 m/s and find the distance travelled by it in 5 sec from the graph.

Q24. Write two importance of universal law of gravitation. 2

Q25. Sea water is considered as homogeneous as well as heterogeneous mixture. Comment on it. 2

Q26. Look at the figure and suggest in which of the vessels, the rate of evaporation will be the highest? Explain. 2

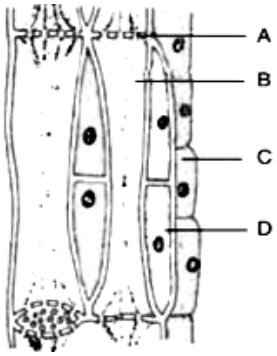


SECTION -C

Q27. Draw the diagram of chloroplast and label any three parts. 3

Q28. (i) Label the parts A, B, C and D. 2

(ii) Name the tissue shown in the following figure and write the function of it. 1



Q29. a) Under what condition the distance and magnitude of displacement are equal? 1+2

b) Can a body have acceleration even if its velocity is zero? Explain with an example.

Q30. a) Define Newton's second law of motion. 1+2

b) A car of mass 1000 kg moving with a velocity of 72 km/h applies its brake and stops in 8 second. What must be the force applied to stop the car?

Q31. Fill in the blanks. 6x½

(a) _____ and _____ are forms of complex tissue.

(b) _____ have guard cells.

(c) Cells of cork contain a chemical called _____.

(d) Husk of coconut is made of _____ tissue.

(e) _____ gives flexibility to plants.

(f) Cell wall of Schlerenchyma has deposition of _____.

Q32. A. Boiling of four liquids X,Y, Z and W are respectively 60°C,100°C,80°C and 75°C. When vapour of these substances are condensed which of them liquefy most easily. Why?

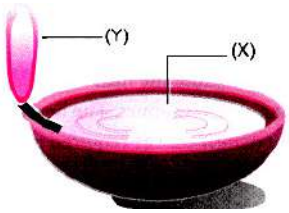
B. Why does ice floats in water even though solids have high density.

C. Identify from the given figure states of substance based on arrangement of particles. 3

A B C

OR

The diagram below shows burning of an oil lamp.



(i) Draw the arrangement of particles of position 'X' and 'Y' when the lamp is burning 1

(ii) What is the state of X and Y? 1

(iii) State a difference between X and Y based on compressibility. 1

Q33. A Teacher provided three materials X, Y and Z to students and asked to segregate these substances. Student has been given information about the substance, X is a good conductor of electricity & is malleable, Y exist as solid, liquid or gas & has low M.P as well as B.P. Z exhibits properties of both X & Y. 3

A. Identify X, Y & Z.

B. Name two substances that has property of X.

C. Name two substances that has property of Y.

D. Name one substance that has property of Z.

SECTION - D

Q34. Answer the following questions :-

a) Name the two organelles in a plant cell that contain their own genetic material and ribosomes. 1

b) How are chromatin and chromosomes related to each other? 2

c) Why are lysosomes also known as "scavengers of the cells"? 2

OR

(i) Draw a plant cell and 2½

(ii) Label the parts which :-

a) determines the function and development of the cell ½

b) packages materials coming from the endoplasmic reticulum ½

c) provides resistance to microbes to withstand hypotonic external media without bursting ½

d) is site for cell organelles. ½

e) is a fluid contained inside the nucleus. ½

Q35. a) Define free fall. 1+2+2

b) Derive the mathematical form of universal law of gravitation.

c) Let the force of attraction between two bodies of mass 10 kg each and kept separated by a distance of 1 m is F. Find the new force of attraction in terms of F if the two bodies are kept at half the previous distance.

OR

a) Define acceleration due to gravity.

b) Establish a relation between acceleration due to gravity 'g' and the universal gravitational constant 'G'.

c) The mass of planet X is double that of earth but its radius is same as that of earth. Find the acceleration due to gravity of planet X. Assume the acceleration due to gravity of earth is 10 m/s^2.

Q36. A. Identify from the given figure metal and non-metal . 1

A

B

B. A solution of 50 g of sugar in 450 g of water. Calculate the concentration in terms of mass by mass percentage of each component of the solution. 1.5

C. Smoke and fog both are aerosols. How do they differ? 1

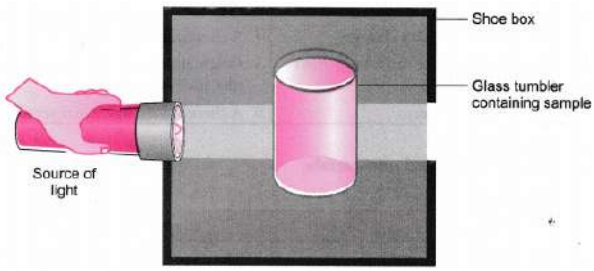
D. Why do we see Tyndall effect in spot light of OPJS Auditorium? 1

E. How can be a saturated solution converted into unsaturated solution? ½

OR

A. A group of students took an old shoe box and covered it with a black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. They placed a milk sample contained in a beaker/tumbler in the box as shown in the figure. They were amazed to see that milk taken in the tumbler was illuminated. They tried the same activity by taking a salt solution but found that light simply passed through it. 2

Why the milk sample was illuminated but the same results were not shown with a salt solution?



B. Pragya tested the solubility of three different substances at different temperatures and collected, the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

Substance Dissolved	Temperature in K				
	283	293	313	333	353
Potassium nitrate	21	32	62	106	167
Sodium chloride	36	36	36	37	37
Potassium chloride	35	35	40	46	54
Ammonium chloride	24	37	41	55	66

a) What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 30 grams of water at 313 K? 1

b) Pragya makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to cool at room temperature. What would she observe as the solution cools? Explain. 1

c) What is the effect of change of temperature on the solubility of a salt? ½

d) Which salt has the highest solubility at 293 K? ½

SECTION - E

Q37. A few layers of cells beneath the epidermis are generally simple permanent tissue. Parenchyma is the most common simple permanent tissue. It consists of relatively unspecialized cells with thin cell walls. They are living cells. Collenchyma allows bending of various parts of the plant-like tendrils and stems of climbers without breaking. Sclerenchyma tissue makes the plant hard and stiff. We have seen the husk of a coconut. It is made of sclerenchymatous tissue. They are long and narrow as the walls are thickened due to lignin. The tissue is present in stems, around vascular bundles, in the veins of leaves and in the hard covering of seeds and nuts.

I. Differentiate between the Collenchyma and Sclerenchyma tissue on the basis of cell wall. 1

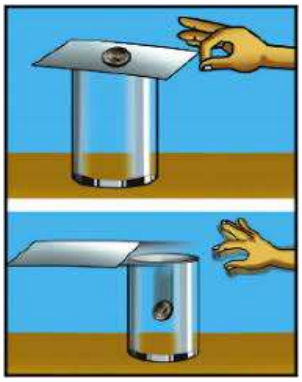
II. Mention the function of Parenchyma and Collenchyma. (One function for each) 1

III. What is aerenchyma and chlorenchyma ? 2

OR

III. If a potted plant is covered with a glass jar, water vapours appear on the wall of glass jar. Explain why? 2

Q38. In the adjacent figure it is observed that the coin falls in the tumbler when the card is flicked with a push.



a) Which specific inertia is involved in it? 1

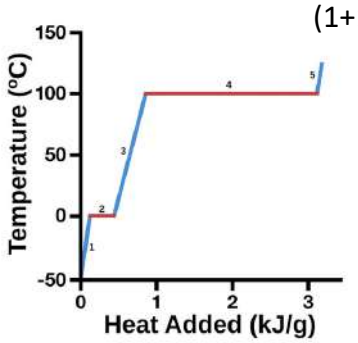
b) Which one has greater inertia: a loaded truck or an empty truck? 1

c) State the law involved in this case. 2

OR

c) What do you mean by inertia?

Q39. A teacher asked a group of students to heat a given sample of substance and draw a heating curve representing temperature rise as a function of heat added. After performing experiment at one atmospheric pressure, the students gave the following curve. Teacher marked points 1, 2, 3, 4 & 5 on the graph and asked students to provide the following information. (1+1+2)



a) What is the physical state of the substance at point 2 and 4?

b) At what temperatures complete change of states takes place?

c) Why does the temperature remain constant in the above graph at 0^0C ? Convert the boiling point of water into Kelvin scale.

OR

c) Name the two terms for heat involved in above processes when temperature remains constant.