

HALF YEARLY EXAMINATION 2024-25

SCIENCE

Time : 3 hrs.]

Class IX

[M.M. : 80

General Instructions—

Read the following instructions very carefully and strictly follow them :

- (i) This question paper comprises 39 questions. All questions are compulsory.
- (ii) This question paper is divided into five sections - A, B, C, D and E.
- (iii) Section A - Question Nos. 1 to 20 are Multiple Choice Questions. Each question carries 1 mark.
- (iv) Section B - Question Nos. 21 to 26 are Very Short Answer (VSA) type questions. Each question carries 2 marks. Answer to these questions should be in the range of 30 to 50 words.
- (v) Section C - Question Nos. 27 to 33 are Short Answer (SA) type questions. Each question carries 3 marks. Answer to these questions should be in the range of 50 to 80 words.
- (vi) Section D - Question Nos. 34 to 36 are Long Answer (LA) type questions. Each question carries 5 marks. Answer to these questions should be in the range of 80 to 120 words.
- (vii) Section E - Question Nos. 37 to 39 are of 3 source-based/ case-based units of assessment carrying 4 marks each with sub-parts.
- (viii) There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.

SECTION-A

1. Chemically, dry ice is—

- (a) Solid SO_2
(c) Solid CO_2

- (b) Solid NO_2
(d) Solid H_2

2. The boiling points of diethyl ether, acetone, and n-butyl alcohol are 35°C , 56°C and 118°C respectively. Which of the following correctly represents their boiling points in Kelvin scale ?
- (a) 306 K, 329 K, 391 K (b) 308 K, 329 K, 392 K
(c) 308 K, 329 K, 391 K (d) 329 K, 392 K, 308 K
3. During rainy season, rate of evaporation decreases because—
- (a) Humidity is high in air (b) Humidity is low in air
(c) Humidity does not change (d) There is no effect of humidity
4. Which of the following statements are correct for pure substances ?
- (i) Pure substances contain only one kind of particles.
(ii) Pure substances may be compounds or mixtures.
(iii) Pure substances have the same composition throughout
(iv) Pure substances can be exemplified by all elements other than copper
- (a) (i) and (ii) (b) (i) and (iii)
(c) (iii) and (iv) (d) (ii) and (iii)
5. Which of the following does not show "Tyndall effect" ?
- (a) Fog (b) Smoke
(c) Milk (d) Salt solution
6. Which of the following is a chemical change ?
- (a) Burning of wood (b) Cutting of wood
(c) Hammering on wood (d) Melting of wax
7. Who Proposed the cell theory ?
- (a) Schleiden and Schwan (b) Watson and crick
(c) Darwin and Wallace (d) Mendel and Morgan
8. Cell Organelle found only in plant is :
- (a) Golgi apparatus (b) Mitochondria
(c) Plastids (d) Ribosomes

9. Transpiration and exchange of gases are functions of—
(a) Stomata (b) Xylem
(c) both a and b (d) Phloem
10. Which tissue forms new cells in plants?
(a) Meristematic (b) Permanent
(c) Simple (d) None of the above
11. Which is not found in Xylem tissues ?
(a) Sieve tubes (b) Xylem Parenchyma
(c) Tracheids (d) Vessels
12. The inertia of an object tends to cause the object—
(a) to increase its speed (b) to decrease its speed
(c) to resist any change in its state of motion (d) to decelerate due to friction
13. If the mass of the body is doubled and its velocity become half, then the linear momentum of the body will :
(a) become double (b) remains the same
(c) become half (d) become four times
14. Suppose a boy is enjoying a ride on a merry-go-round, which is moving with a constant speed of 10 m/s. It implies that the boy is :
(a) at rest (b) moving with no acceleration
(c) moving with uniform velocity (d) in accelerated motion.
15. The numerical ratio of displacement to distance for a moving object is :
(a) always less than 1 (b) equal to 1 or less than 1
(c) always more than 1 (d) equal to 1 or more than 1
16. The weight of an object at the centre of the Earth of radius R is :
(a) zero (b) infinite
(c) R times the weight at the surface of the earth
(d) $1/R$ times the weight at the surface of the Earth.

For Q. Nos. 17 to 20, two statements are given - One labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false, but Reason (R) is true.

17. **Assertion (A) :** Suspension is a heterogeneous mixture.

Reason (R) : The solute particles do not dissolve but remain suspended throughout the bulk of the medium.

18. **Assertion (A) :** A cell swells up when present in a hypotonic solution.

Reason (R) : More water molecules ^{move} into the cell than they leave.

19. **Assertion (A) :** Xylem and phloem are complex tissues.

Reason (R) : Complex tissue is a collection of different types of cells.

20. **Assertion (A) :** A fielder lowers his hands while catching a cricket ball and suffers less reaction force.

Reason (R) : The time of catch increases when ~~field~~ ^{fielder} lowers his hand, resulting in decreasing the force.

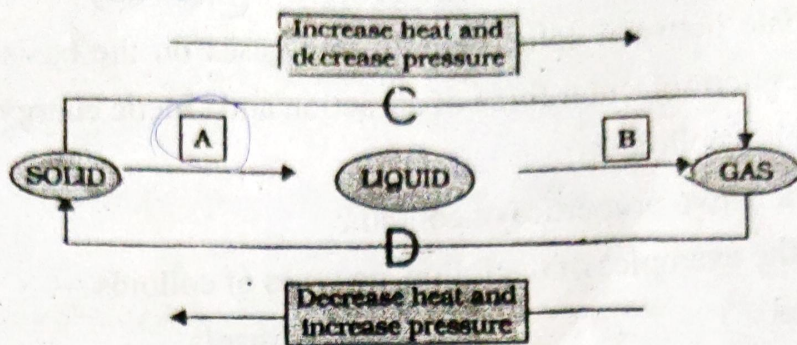
SECTION-B

21. Give reasons—

- (a) A gas fills completely the vessel in which it is kept.
- (b) Naphthalene balls disappear with time without leaving any solid.

OR

Name A, B, C, D in the following diagram showing change in state of matter—



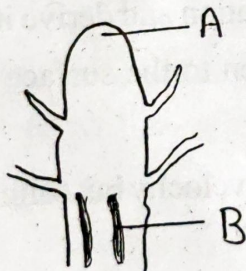
22. Give reasons—

- (a) Lysosomes are called suicidal bags of the cell
- (b) Skin of your fingers shrink when you wash clothes for a long time.

23. What is the role of epidermis in plants? (Write any two points)

24. (a) What does the given figure show ?

(b) Write the functions of A and B ?



25. A hammer of mass 600 g moving at 60 m/s, strikes a nail. The nail stops the hammer in a very short time of 0.01 second, what is the force of the nail on the hammer?

OR

✓ Explain why some of the leaves may get detached from a tree if we vigorously shake the branch.

26. Differentiate between rough and smooth endoplasmic reticulum. (Write any two points)

OR

Why is nucleus called "director of the cell"?

SECTION-C

27. Differentiate between solids, liquids and gases on the basis of their rate of diffusion, intermolecular force of attraction and kinetic energy of molecules.
28. (a) What is a colloid ?
 (b) State any two properties of colloid ?
 (c) Give the examples of the following types of colloids—
 (i) gel (ii) aerosols

OR

Give three points of difference between sol, solution and suspension. Also give suitable examples of all three.

29. (a) A solution contains 80 g of Ammonium chloride in 320 g of water. Calculate the concentration in terms of mass by mass percentage of the solution.
 (b) How will the solubility of a solution be affected by change in temperature?
30. (a) State the universal law of gravitation and derive its mathematical expression.
 (b) An object of mass 5 Kg is taken to the surface of moon. What will be its mass there and why ?
31. (a) An object can have zero average velocity but cannot have zero average speed. Justify.
 (b) A ball is gently dropped from a height of 20 m. If its velocity increases uniformly at the rate of 10 m/s^2 , with what velocity will it strike the ground. After what time will it strike the ground?

OR

- (a) What can you say about the motion of an object whose distance time graph is a straight line parallel to the time axis?
- (b) State which of the following situations are possible and give an example for each of these :
- (i) an object with a constant acceleration with zero velocity
 (ii) An object moving with an acceleration but with uniform speed

32. (a) A horse continues to apply a force in order to move a cart with a constant speed. Explain why?
- (b) Explain any two instances of application of second law of motion from your daily life.
33. Why is mitochondria called a "power house of cell"? Give two similarities and one difference between Mitochondria and Plastid?

OR

- (a) How is prokaryotic cell different from eukaryotic cell ?
- (b) How is plasma membrane different from cell membrane?

SECTION-D

34. (a) What is a compound ? Which of the following can be categorised as a compound ?
- Common salt, Brass, Marble, Smoke, Nitrogen, Calcium.
- (b) A substance shows the following characteristics malleable, sonorous, good conductor of heat and electricity.
- (i) Identify the type of substance.
- (ii) Give two examples of such substances.
- (iii) Can you categorise the above substance as pure? Give reason for your answer.

OR

- (a) Differentiate between Homogenous and Heterogenous Mixtures (2 points each)
- (b) Classify the following as homogenous/heterogenous mixtures :
- Soil, Stainless steel, Aerated drinks, Clouds
- (c) If Carbon and Oxygen react with each other in a fixed ratio, Carbon dioxide is formed. Will the product formed retain the properties of Carbon and Oxygen? Give reason(s) for your answer.

35. (a) Define diffusion.
 (b) With the help of self explanatory diagram. Describe the process of meiosis and mitosis.

OR

(1) Name the following—

(a) Name the kidney shaped cells that enclose stomata.

(b) Name the process of taking up a permanent shape, size and function. *of cells.*

(2) Draw diagram of plant cell and label any six parts of it.

36. (a) When will you say a body is in :

(i) uniform acceleration

(ii) non-uniform acceleration

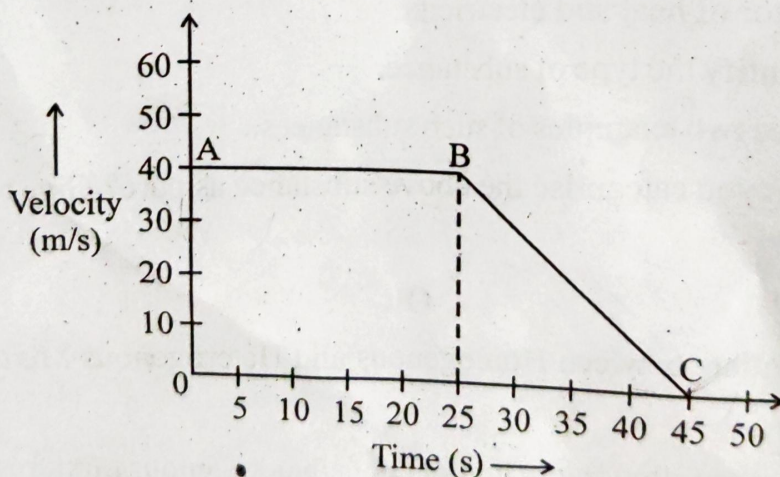
(b) The brakes apply to a car produces an acceleration of 6 m/s^2 in the opposite direction to motion. If Car takes 3 seconds to come to rest after applying brakes. Calculate :

(i) initial velocity of the car

(ii) the distance covered by the car

OR

The velocity time graph of an object is shown—



(a) State the kind of motion that object. *☑*

☑ has from A to B and from B to C.

- (b) Identify the part of graph where the object has zero acceleration. Give reason for your answer.
- (c) Identify the part of graph where the object has negative acceleration. Give reason for your answer.
- (d) With what velocity the object is moving at $t = 25$ seconds.
- (e) Calculate the retardation of the body.

SECTION-E

37. Particles in water at 0°C (273 K) have more energy as compared to particles in ice at the same temperature. When we supply heat energy to water, particles start moving even faster. At a certain temperature, a point is reached when the particles have enough energy to break free from the forces of attraction of each other. At this temperature the liquid starts changing into gas. The temperature at which a liquid starts boiling at the atmospheric pressure is known as its boiling point.
- Define latent heat of vaporisation.
 - Why does steam produces more burns on body as compared to boiling water?
 - Give two points of difference between Boiling and Evaporation.

OR

Illustrate two practical applications of the process of Evaporation.

38. Parenchyma forms the bulk of the plant body. These cells possess the power of diffusion. The Parenchyma cells are oval, round, polygonal in shape. Some Parenchyma tissue also consist of chlorophyll.
- Where is parenchyma found in plants ?
 - Is Parenchyma a living or dead tissue? Show Parenchyma cells with diagram.
 - Write down two main functions of Parenchyma.

OR

What is the role of parenchyma in hydrophytes?

39. You must have seen rowing of boats in rivers and lakes. While rowing his boat, a boat man pushes the water backwards with his oars. In turn, the water exerts an

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equal and opposite force on the boat and the boat moves in water in forward direction.

- (a) What names are given to forces exerted by boatman and by water? What is the relationship between the two forces?
- (b) Which law of motion is involved here? Define it.
- (c) Give another illustration of the said law.

OR

Why does a ball rebound on striking a hard surface.