9th CBSE Science Ankur School

Student Name:_____ Roll. No._____

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 Answer type 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 Long Answer type questions carrying 05 marks each. Answers 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

1. The inertia of an object causes the object to
(a) decrease its speed (b) increase its speed
(c) resist any change in the state of its motion (d) decelerate due to friction

2. Which of the following is not a pure substance?
(a) Water (b) Air (c) Diamond (d) Gold

3. The property of a substance to be hammered into thin sheets is called
(a) Ductility (b) Malleability (c) Solubility (d) Viscosity

4. What does the slope of the distance-time graph give?
(A) Speed (b) Velocity (c) Acceleration (d) Displacement

5. What is the smallest particle of an element that retains its properties?
(a) Atom (b) Molecule (c) Ion (d) Neutron

6. The atomic number of an element is alter mined by the number of
(a) Proton (b) Electron (c) Neutrons (d) Nucleons

7. Which scientist's experiment led to the discovery of the nucleus of an atom?
(a) JJ. Thomson (b) Ernest Rutherford (c) Niels Bohr (d) Dmitri Mendeleev

8. Which of the following is a pure substance?
(a) Air (b) Sail (c) Mercury (d) Vinegar

9. Which of the following is not a property of gas?
(a) have a definite shape (b) Cases have no definite volume
(c) The rate of diffusion of a gas is higher. (d) The intermolecular force of attraction is less

10. The weight of an object on the Moon's surface is
(a) 1/3rd of the weight on Earth (b) 1/5th of the weight on Earth
(c) 1/6th of the weight on Earth (d) 1/2nd of the weight on Earth

11. The phenomenon where a sound produced is heard again due to reflection is called-
(a) Sound bounce (b) Mirage (c) An echo (d) Interference

12. Tonoplast is associated with the
(a) EP (b) Vacuoles (c) Plasma membrane (d) Nucleus

13. Which one of the following nutrients is not available in fertilisers?
(a) Nitrogen (b) Phosphorus (c) Iron (d) Potassium

14. Nerve cells do not contain
(a) Axon (b) Nerve Ending (c) Tendons (d) Nerves

15. In desert plants, rate of water loss gets reduced due to the presence of
(a) cuticle (b) stomata (c) lignin (d) suberin

16. Cartilage is not found in
(a) Nose (b) Ear (c) Kidney (d) Larynx

DIRECTION: In each of the following questions (from 17 to 20), a statement of Assertion is given and a corresponding statement of Reason is given 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.
(e) Both Assertion and Reason are false.

17. Assertion: The flash of lightening is seen before the sound of thunder is heard.
Reason: Speed of sound is greater than speed of light.

18. Assertion: A plant cell bursts if placed in water.
Reason: High turgor pressure causes bursting of plant cells.

19. Assertion: The inner lining of intestine has tall epithelial cells.
Reason: Columnar epithelium facilitates absorption and secretion.

20. Assertion-The symbol of iron is Fe.
Reason-Latin name of iron is ferrum.

SECTION-B

21. Give difference between Mass and Weight?

22. When a carpet is beaten with a stick, dust comes out of it. Explain.

23. What is pisciculture? Name one marine and one fresh water fish.

24. Name the various elements of Phloem.

25. Define Valency. The Helium atom has 2 electrons in its outermost shell, but its valency is not 2. Explain.

26. Na has filled K and L shells. Give reason.

SECTION-C

27. The kinetic energy of an object of mass, m moving with a velocity of 5 ms-1 is 25 J. What will be its kinetic energy when its velocity is doubled?

28. (a) Compare the use of manure and fertilizers in maintaining soil fertility.
(b) Which organelle is known as kitchen of a plant cell?

29. Which organelle is known as the power house of the cell? Why?

30. Derive the mathematical expression of Kinetic Energy.

31. (a) State the universal law of gravitation. (b) Write three differences between 'g' and 'G'.

32. Describe Bohr's model of an atom with the help the Diagram.

33. Differentiate between a suspension and a colloid.

SECTION-D

34. Which wave property determines (a) loudness (b) pitch?
(ii) A stone is dropped from the top of a tower 500 m high into a pond of water at the base of the tower. When is the splash heard at the top? (Given $g=10m/s^2$ and speed of sound=340m/s.)

35. (a) Differentiate between Sclerenchyma and Parenchyma tissues.
(b) Write differences between plant and animal cell.

36. (a) What is Isotope and Isobar? Explain with examples.
(b) If bromine atom is available in the form of say, two isotopes $^{79}_{35}Br(49.7\%)$ and $^{81}_{35}Br(50.3\%)$, calculate the average atomic mass of bromine atom.

SECTION-E

37. Sound is produced by vibrating objects. The matter or substance through which sound is transmitted is called a medium. It can be solid, liquid or gas. Sound moves through a medium from the point of generation to the listener. When an object vibrates, it sets the particles of the medium around it vibrating. The particles do not travel all the way from the vibrating object to the ear. Sound waves are characterized by the motion of particles in the medium and are called mechanical waves. When a vibrating object moves forward, it pushes and compresses the air in front of it creating a region of high pressure; this region is called a compression (C). When the vibrating object moves backwards, it creates a region of low pressure called rarefaction (R). Hence sound is longitudinal wave.

(1) Sound waves are…….. waves. (2) Sound travel in medium with
(a) compression and rare fraction (b) crest and trough
(c) both can be possible (d) none of these
(3) What is sound and how is it produced?
(4) Why sound wave is called as longitudinal wave?

38. According to Dalton's atomic theory, all matter whether an element, a compound, or a mixture is composed of small particles called atoms which can neither be created nor destroyed during a chemical reaction. Dalton's theory provides a simple explanation for **the laws** of chemical combination. He used his theory to explain the law of conservation of masses, the law of constant proportions, and the law of multiple proportions, based on various postulates of the theory. Dalton was the first scientist to use the symbols for the elements in a very specific sense. When he used a symbol for an element he also meant a definite quantity of that element that is one atom of that element.

(1) Which postulate of Dalton's atomic theory is the result of the law of conservation of mass?

(2) Which postulate of Dalton's atomic theory explains law of definite proportions?

(3) "If 100 g of calcium carbonate (whether in the form of marble or chalk) is decomposed, 56 g of calcium oxide and 44 g of carbon dioxide are formed." Which law of chemical combination is illustrated by this statement?

(4) When 5 g calcium is burnt in 2 g oxygen, 7 g of calcium oxide is produced. When 5 g of calcium is burnt in 20 g of oxygen, then also 7 g of calcium oxide is produced. Which law of chemical combination is being followed?

39. Plasma membrane or Cell membrane is the outermost covering of the cell that separates the contents of the cell from its external environment. The plasma membrane is flexible and is made up of organic molecules called lipids and proteins. The flexibility of the cell membrane also enables the cell to engulf in food and other material from its external environment. Such processes are known as endocytosis. The plasma membrane allows or permits the entry and exit of some materials in and out of the cell. It also prevents movement of some other materials. The cell membrane, therefore, is called a selectively permeable membrane.

Some substances like carbon dioxide or oxygen can move across the cell membrane by a process called diffusion. There is spontaneous movement of a substance from a region of high concentration to a region where its concentration is low. Similar thing happens in cells - some substance like CO_2 (carbon dioxide is cellular waste and requires to be excreted out by the cell) accumulates in high concentrations inside the cell. In the cell's external environment, the concentration of CO_2 is low as compared to that inside the cell. As soon as there is a difference of concentration of CO_2 inside and outside a cell, CO_2 moves out of the cell, from a region of high concentration, to a region of low concentration outside the cell by the process of diffusion.

Water obeys the law of diffusion. The movement of water molecules through such a selectively permeable membrane is called osmosis. The movement of water across the plasma membrane is also affected by the amount of substance dissolved in water. Thus, osmosis is the net diffusion of water across a selectively permeable membrane toward a higher solute concentration.

(1) The plasma membrane is made up of

(a) Proteins (b) Lipids

(c) Proteins and Lipids (Lipoproteins) (d) none of above

(2) Which of the following substance is known as cellular waste?

(a) Oxygen (b) Nitrogen (c) Carbon dioxide (d) None of above

(3) The movement of a substance from the region of higher concentration to the region where its concentration is lower is called as

(a) Osmosis (b) Diffusion (c) Excretion of CO_2 (d) All of the above

(4)Why cell membrane is known as selectively permeable membrane?

Motion

- Q4. What does the slope of the distance-time graph give?
- Q21. Give difference between Mass and Weight?
- Q30. Derive the mathematical expression of Kinetic Energy.

🔷 Force and Laws of Motion

- Q1. The inertia of an object causes the object to...
- Q22. When a carpet is beaten with a stick, dust comes out of it. Explain.

🔷 Gravitation

- Q10. The weight of an object on the Moon's surface is...
- Q31. (a) State the universal law of gravitation. (b) Write three differences between 'g' and 'G'.
- Q34(ii). A stone is dropped from a tower... splash is heard?

🔷 Work and Energy

- Q27. Kinetic energy of mass m with 5 m/s velocity is 25 J. Find when velocity is doubled.
- Q30. Derive the mathematical expression of Kinetic Energy. *(Also fits Motion)*

🔷 Sound

- Q11. The phenomenon where a sound produced is heard again...
- Q17. Assertion: Flash of lightning is seen before thunder... *(Sound vs Light speed)*
- Q34(i). Which wave property determines (a) loudness (b) pitch?
- Q37. Passage-based questions about Sound as a longitudinal wave.

🔷 The Fundamental Unit of Life

- Q12. Tonoplast is associated with...
- Q28(b). Which organelle is known as kitchen of a plant cell?
- Q29. Which organelle is known as the power house of the cell?
- Q39. Passage-based questions about Plasma membrane and diffusion/osmosis.

🔷 Tissues

- Q14. Nerve cells do not contain...
- Q15. In desert plants, rate of water loss gets reduced due to...
- Q16. Cartilage is not found in...
- Q19. Assertion: Inner lining of intestine has tall epithelial cells...
- Q35(a). Difference between Sclerenchyma and Parenchyma
- Q35(b). Write differences between plant and animal cell.
- *(No direct questions from this chapter in the list provided)*

Improvement in Food Resources

- Q13. Which one of the following nutrients is not available in fertilizers?
- Q23. What is pisciculture? Name one marine and one freshwater fish.
- Q28(a). Compare manure and fertilizers.

Matter in Our Surroundings

- Q9. Which of the following is not a property of gas?

Is Matter Around Us Pure?

- Q2. Which of the following is not a pure substance?
- Q3. Property of a substance to be hammered into thin sheets...
- Q8. Which of the following is a pure substance?
- Q33. Differentiate between a suspension and a colloid.

Atoms and Molecules

- Q5. Smallest particle of an element that retains its properties?
- Q6. Atomic number determined by number of...
- Q20. Assertion: The symbol of iron is Fe...
- Q25. Define Valency. Helium has 2 electrons but valency not 2.
- Q26. Na has filled K and L shells. Give reason.
- Q38. Passage-based questions on Dalton's atomic theory.

Structure of the Atom

- Q7. Scientist who discovered nucleus...
- Q32. Describe Bohr's model of atom.
- Q36. (a) What is Isotope and Isobar? (b) Calculate avg. atomic mass of bromine.