

Sample Paper 3

Class IX 2022-23

Science (086)

Time: 3 Hours

Max. Marks: 80

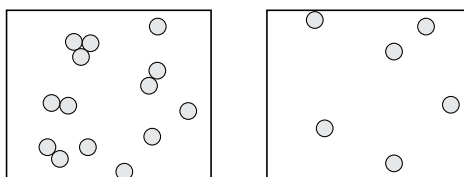
General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
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.

SECTION-A

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

1. The diagrams show the arrangement of particles of a substance at temperatures 20°C and 40°C .



What are the likely melting and boiling points of the substance?

	Melting point/ $^{\circ}\text{C}$	Boiling point/ $^{\circ}\text{C}$
(a)	-12	35
(b)	-25	45
(c)	-98	100
(d)	44	80

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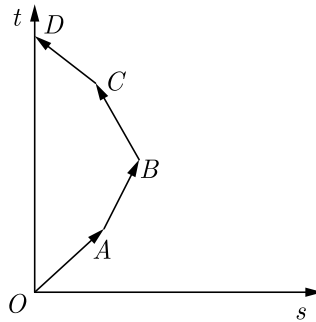
2. Select the incorrect statements(s).
1. Although ice, water and water vapour all look different and display different physical properties, they are chemically the same.
 2. During burning of a candle, both physical and chemical changes take place.
 3. Both water and cooking oil are liquid but their chemical characteristics are different. They differ in odour and inflammability.
 4. It is the physical property of oil that makes it different from water.
- (a) 1 and 2 (b) 2 and 3
(c) 1, 2 and 3 (d) Only 4
3. Which of these is/are conserved during a chemical reaction?
- (a) mass only (b) charge only
(c) both mass and charge (d) neither mass nor charge
4. We know that like charges repel each other. Then how do the protons, which are all positively charged, stay together in an atom's nucleus?
- (a) The neutral charge of the neutron keeps them together.
(b) Nuclei keep decaying in short intervals because of this.
(c) The nucleic force is stronger than their mutual repulsion.
(d) That like charges repel is not true at the level of the nucleus.
5. Plasma membrane is composed of



- (a) cellulose and lipids (b) lipids and proteins
(c) peptidoglycan and lipids (d) cellulose and proteins
6. Which of the following protects the animal cell from the outside environment?
- (a) Cell wall (b) Plasma membrane
(c) Nuclear membrane (d) Cytoplasm

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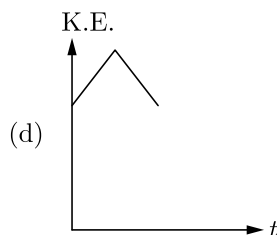
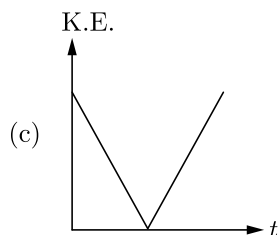
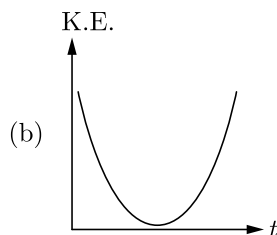
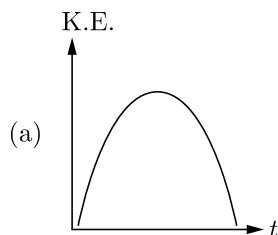
7. Which of the following options is correct for the object having a straight line motion represented by the following graph?



- (a) The object moves with constantly increasing velocity from O to A and then it moves with constant velocity.
- (b) Velocity of the object increases uniformly.
- (c) Average velocity is zero.
- (d) The graph shown is impossible.
8. A hockey player pushes the ball on the ground. It comes to rest after travelling certain distance because
- (a) the player stops pushing the ball. (b) balanced force acts on the ball.
- (c) the opposing force acts on the ball. (d) none of these
9. Which of the following statements is/are correct?
1. Mass of an object is the measure of its inertia.
 2. Heavier the object smaller is the inertia.
 3. The mass of an object is variable.
- (a) Only 1 (b) 1 and 3
- (c) 2 and 3 (d) 1 and 2

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10. A cricket ball is projected vertically upward such that it returns back to the thrower. The variation in kinetic energy with time is best represented by



11. The sound waves having a frequency more than 20,000 Hz are called
- (a) infrasonic waves (b) supersonic waves
(c) ultrasonic waves (d) hypersonic waves
12. A waxy, water resistant layer is observed in the xerophytic plants. What is the layer called as?
- (a) Endodermis (b) Cortex
(c) Phloem (d) Epidermis
13. If the component of the substance can be separated by a chemical change only then it is
- (a) element (b) compound
(c) mixture (d) both (a) and (b)
14. The atomic mass of calcium (Ca) is 40 g. The number of moles in 60 g of calcium are
- (a) 0.5 mol (b) 2.0 mol
(c) 1.5 mol (d) 0.75 mol
15. A cell loses water by osmosis when kept in a solution having a lower concentration of water than the cell. The given solution is
- (a) hyper-tonic (b) hypo-tonic
(c) isotonic (d) dilute

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16. Which component of sclerenchyma tissues harden and thicken their secondary walls?
- (a) Suberin (b) Calcium
(c) Lignin (d) Magnesium

Question no. 17 to 20 are Assertion-Reasoning based questions.

17. **Assertion :** Motion with uniform velocity is always along a straight line path.
Reason : In uniform velocity a motion, speed is the magnitude of the velocity and is equal to the instantaneous velocity.
- (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) Both assertion and reason are false.
18. **Assertion :** Linear momentum is conserved in both elastic and inelastic collisions.
Reason : Total energy is conserved in all collisions.
- (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) Both assertion and reason are false.
19. **Assertion :** A man is sitting in a boat which floats on a pond. If the man drinks some water from the pond, the level of water in the pond will decrease.
Reason : The weight of the liquid displaced by the body is greater than the weight of the body.
- (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) Both assertion and reason are false.
20. **Assertion :** A spring has potential energy, both when it is compressed or stretched.
Reason : In compressing or stretching, work is done on the spring against the restoring force.
- (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.

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SECTION-B

Question no. 21 to 26 are very short answer questions.

21. Write down four properties of a Solution.

or

State the principle of the process of centrifugation.

22. Why the number of atoms in one mole of hydrogen gas is double the number of atoms in one mole of helium gas? Explain.

23. Who discovered cells in living organisms? Give an example of unicellular organism.

24. A ball moving on a table reaches the edge and falls. Sketch the path it will follow while falling.

25. What is the range of frequencies associated with :

- (a) Infrasound
- (b) Ultrasound

or

What are longitudinal waves? Give two examples.

26. What are the three advantages of shorter duration of the crop in between sowing and harvesting?

SECTION-C

Question no. 27 to 33 are short answer questions.

27. A karate expert can easily move his hand through a solid block of wood but we cannot. Why ?

28. Write characteristics of compounds.

29. What would happen if when we put an animal cell into a solution of sugar or salt in water?

or

What is the function of plastids?

30. What are the four main functions of epithelial tissue?

31. In a long distance race, the athletes were expected to take four rounds of the track such that the line of finish was same as the track was 200 m.

- (i) What is the total distance to be covered by the athletes?
- (ii) What is the displacement of the athletes when they touch the finish line?
- (iii) Is the motion of the athletes uniform or non-uniform?
- (iv) Is the distance moved by and displacement of athletes at the end of the race equal?

32. (a) What is meant by potential energy? Is potential energy vector or scalar quantity?
(b) Give one example of a body having potential energy.

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or

Define : (a) power (b) work done (c) kinetic energy. Give SI unit of each.

33. Distinguish between transverse and longitudinal waves (three points).

SECTION-D

Question no. 34 to 36 are Long answer questions.

34. Explain Rutherford's atomic model.

or

Define isotopes. Why do isotopes have same atomic number but different mass number ? Explain with the help of an example.

35. Explain the structure of three types of muscle fibres. Also write the locations where they are found in the body.

or

How many types of meristems are present in plants, on the basis of position?

36. Give brief sketch on advantages and disadvantages on manure and fertilizers.

SECTION-E

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

37. The nucleus of atom contains positively charged particles called protons and neutral particles called neutrons. The number of protons in an atom is called the atomic number and is denoted by the symbol ' Z '. All atoms of an element have the same atomic number. The electrons occupy the space outside the nucleus. In order to account for the electrically neutral nature of the atom, the number of protons in the nucleus is exactly equal to the number of electrons.

Thus, Atomic number = Number of protons = Number of electrons

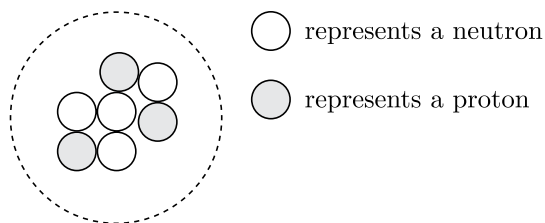
You would remember that according to Dalton's theory, the atoms of different elements are different from each other. We can now say that this difference is due to difference in the numbers of protons present in the nucleus of the element. In other words, different elements differ in terms of their atomic number.

For example, the atoms of hydrogen and helium are different because hydrogen has one proton in its nucleus whereas the nucleus of helium atom contains two protons. Their atomic numbers are 1 and 2, respectively. You have learnt in the Rutherford's model that the mass of the atom is concentrated in its nucleus. This is due to the presence of two heavy particles namely protons and neutrons in the nucleus. These particles are called nucleons. The number of nucleons in the nucleus of an atom is called its mass number. It is denoted by ' A ' and is equal to the total number of protons and neutrons present in the nucleus of an element.

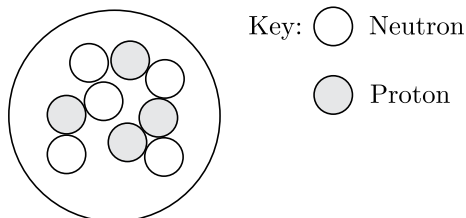
Thus, Mass number (A) = Number of protons (Z) + Number of neutrons (n) Atomic number and mass number are represented on the symbol of an element.

- (i) The diagram shows the nucleus of an atom of X . What is the X in the given diagram?

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- (ii) The diagram given below shows the sub-atomic particles present in the nucleus of atom X .



What is the symbol for atom X ?

- (iii) The formula of a molecule is X_2 . One molecule of X_2 , contains 18 protons. If the nucleon number of X is 19, how many neutrons are there in one atom of X ?

or

- (iv) Find the number of neutrons in $^{31}\text{X}_{15}$?

38. Fish is one of the easily available, highly affordable and nutritious food for people, especially in coastal regions. Fish is a rich source of proteins. Fish liver oil is obtained for vitamin A and vitamin D.

The different type of fish obtained for food are :

- (i) Agnatha (jawless fish)
- (ii) Chondrichthyes (cartilagenous fish)
- (iii) Osteichthyes (bony fish)

Other fish include Jelly fish (Aurelia), Star fish, shell fish (prawns and molluscs), cattle fish etc.

The establishments which are associated with production, preservation, capture and exploitation of fishes, crabs, lobsters, prawns etc. are called fisheries. Both true fish (gill containing finned vertebrates which contain scales on their skin) and shelled fish are produced in fisheries. Fisheries are of following types, based on mode of obtaining fish.

- (i) What do you mean by mariculture.?
- (ii) What is the common name of *Penaeus monodon*?
- (iii) Which of the marine fish of high economic value?
- (iv) What is the correct function of the figure given below?



or

- (v) What is fresh water prawn called?

39. Newton's first law of motion states that a body continues to remain in state of rest or of uniform motion along a straight line unless an external unbalanced force acts on it. Thus, a body cannot change its state of rest or motion unless compelled by an external force. In other words, every body possesses a property by virtue of which it resists any change in its state of rest or of uniform motion. This property is known as inertia of that body.

Inertia is an inherent property or the tendency of a body to oppose any change in its state of rest or of uniform motion in a particular direction. Thus, Newton's first law of motion is also called law of inertia as it defines inertia in its statement.

To change the state of rest or motion of the body, force is required. If greater force is required to do so, it means the body has more inertia. Since more force is required to change the state of heavier objects than light objects, we conclude that greater the mass of a body, more is the inertia possessed by it. We can also state that mass is a measure of inertia of the body.

- (i) A hockey player pushes the ball on the ground. Why it comes to rest after travelling certain distance?
- (ii) What is velocity-time graph of a moving particle on which net external force is zero?
- (iii) On what factor does the inertia of a body depend?
- (iv) Which has more inertia, a cricket ball or rubber of the same size?

or

- (v) Does inertia change with velocity?

□□□□□□

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