

# Sample Paper 2

Class IX 2022-23

Science (086)

Time: 3 Hours

Max. Marks: 80

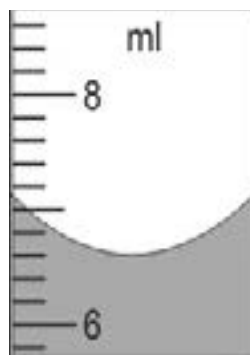
## General Instructions:

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.

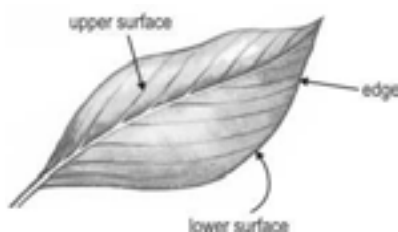
1. The figure shows the amount of water in a graduated test-tube. The curved surface shown is called the meniscus. What is the correct reading of the volume of liquid?



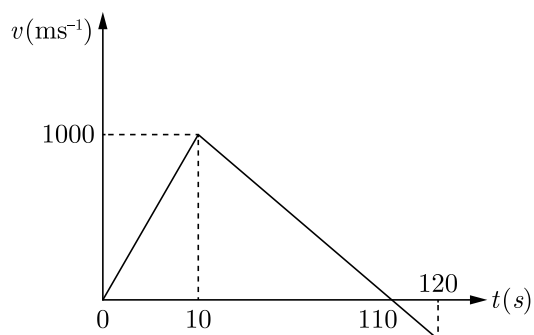
- |            |            |
|------------|------------|
| (a) 7.1 ml | (b) 7.2 ml |
| (c) 6.8 ml | (d) 6.6 ml |
- 
2. If the component of the substance can be separated by a chemical change only then it is  
(a) element (b) compound  
(c) mixture (d) both (a) and (b)

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3. A sample of pure water, irrespective of its source contains 11.1% hydrogen and 88.9% oxygen. The data supports
- (a) law of constant proportions (b) law of conservation of mass  
(c) law of reciprocal proportions (d) law of multiple proportions
4. Atoms consist of electrons, protons and neutrons. Isotopes of an element show similar chemical properties, but have different atomic weights. Thus they are likely to have:
- (a) same number of electrons, protons and neutrons  
(b) same number of electrons and neutrons; different number of protons  
(c) same number of neutrons and protons; different number of electrons  
(d) same number of electrons and protons; different number of neutrons
5. A plant cell placed in a hypo-tonic solution will not burst because of presence of
- (a) plasma membrane (b) cell wall  
(c) chloroplast (d) cytoplasm
6. In a leaf, chloroplast-containing cells are known to be the sites of photosynthesis. In which part of the leaf are the majority of chloroplast-bearing cells likely to be found?



- (a) upper surface of the leaf (b) lower surface of the leaf  
(c) equally throughout the leaf (d) edges of the leaf
7. The graph shows the variation of velocity of a rocket with time. Then, the maximum height attained by the rocket is

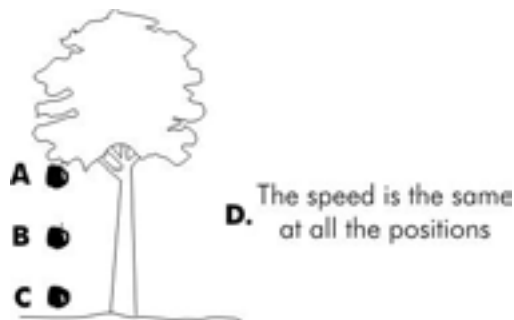


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- (a) 1.1 km
- (b) 5 km
- (c) 55 km
- (d) none of these

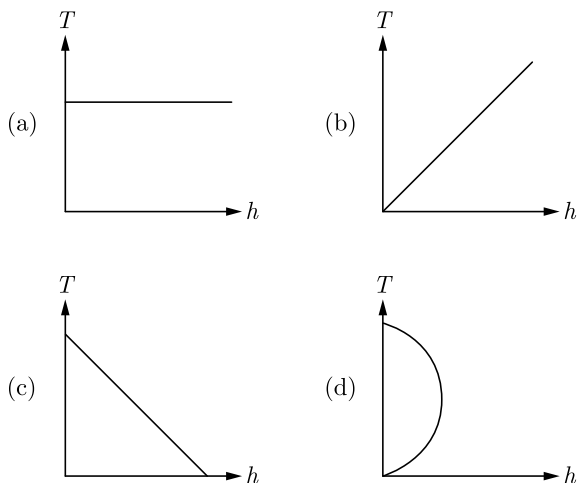
8. Identify the correct statement(s).
1. To accelerate the motion of an object, a balanced force is required.
  2. Balanced forces do not change the state of rest or of motion of an object.
  3. Balanced forces do not produce any acceleration, they can change the shape or size of the body.
- (a) 1 and 2
  - (b) 2 and 3
  - (c) 1 and 3
  - (d) None of these

9. An apple falling from a tree is an example of \_\_\_\_\_ motion.



- (a) Rectilinear
- (b) Oscillatory
- (c) Periodic
- (d) Rotational

10. Which of the following graph best represents the total energy ( $T$ ) of a freely falling body and its height ( $h$ ) above the ground?

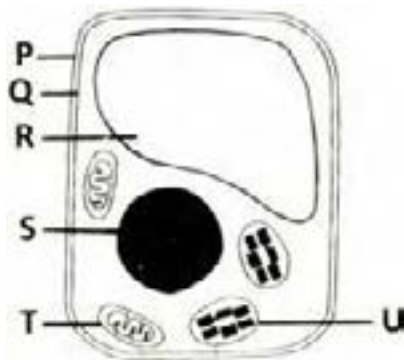


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11. When a sound wave travels in air, the physical quantity which is transferred from one place to the other is
- (a) mass (b) force  
(c) air particle (d) energy
12. The muscle fibre shown in the diagram is:



- (a) involuntary (b) voluntary  
(c) voluntary and involuntary (d) none of these
13. What type of mixtures are separated by crystallisation?
- (a) A mixture in which one component is soluble in a solvent.  
(b) A mixture in which impurities are soluble in a solvent.  
(c) A mixture in which both the components are soluble in a solvent.  
(d) A mixture in which both the components are insoluble in water.
14. All samples of carbon-dioxide contain carbon and oxygen in the mass ratio 3 : 8. This is in agreement with the law of
- (a) conservation of mass (b) constant proportions  
(c) multiple proportions (d) gaseous volumes
15. Which labelled organelles helped a student to conclude that it is a plant cell?



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- (a) P and R only (b) P and S only  
(c) P, R and T only (d) P, R and U only

16. There are specific regions of plant body that constantly remain in the state of division. What are they?

- (a) Perisperm (b) Endosperm  
(c) Meristem (d) Stele

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

17. **Assertion :** The graph between two physical quantities  $P$  and  $Q$  is straight line, when  $P/Q$  is constant.

**Reason :** The straight line graph means that  $P$  is proportional to  $Q$  or  $P$  is equal to constant multiplied by  $Q$ .

- (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 :** A boy facing forward in a moving bus throws a ball straight up. At the same instant the bus begins to accelerate. The ball goes up and falls in front of the boy.

**Reason :** As the ball rises, velocity remains constant.

- (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 :** The density of a liquid depends upon the nature and temperature of the liquid.

**Reason :** The volume of the liquid depends upon temperature.

- (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 :** When the force retards the motion of a body, the work done is zero.

**Reason :** Work done depends on angle between force and displacement.

- (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.

## SECTION-B

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

21. What makes water as a universal solvent ?

or

Identify the following as physical or chemical changes:

- (a) Formation of cloud
- (b) Magnetizing a iron nail
- (c) Water boils to form steam
- (d) An almirah gets rusted

22. How can Dalton's atomic theory explain the Law of Constant Proportions ?

23. State the difference between smooth endoplasmic reticulum and rough endoplasmic reticulum.

24. Write four phenomenons which were successfully explained using universal law of gravitation.

25. Explain, why can echoes not be heard in a small room?

or

Sound is produced due to a vibratory motion, then why a vibrating pendulum does not produce sound?

26. What are the different ways/methods of hybridisation?

## SECTION-C

Question no. 27 to 33 are short answer questions.

27. Two cubes of ice are pressed hard between two palms and after releasing the pressure, the cubes join together. Why ?

28. Why is water considered as compound ?

29. What is the difference in chromatin, chromosomes and gene?

or

List any six functions of nucleus of a cell.

30. Differentiate between collenchyma, parenchyma and sclerenchyma.

31. What is the difference between uniform linear motion and uniform circular motion?

32. When a constant force is applied to a body moving with constant acceleration, is the power of the force constant? If not, how would force have to vary with speed for the power to be constant?

or

- (a) An arrow moves forward when released from a stretched bow. Explain the transformation of energy in the process.
- (b) A boy of mass 50 kg climbs up a vertical height of 100 m. Calculate the amount of potential energy he gains.

33. A person fires a gun standing at a distance of 55 m from a wall. If the speed of sound is  $330 \text{ ms}^{-1}$ , find the time for an echo to be heard.

## SECTION-D

Question no. 34 to 36 are Long answer questions.

34. Give the number of electron, proton and neutron in  ${}_{59}\text{CO}^{27}$  and  ${}_{108}\text{Ag}^{47}$ .

or

Give the postulates of Dalton's atomic theory.

35. Explain connective tissue along with its types.

or

Give the difference between the types of muscle fibres diagrammatically.

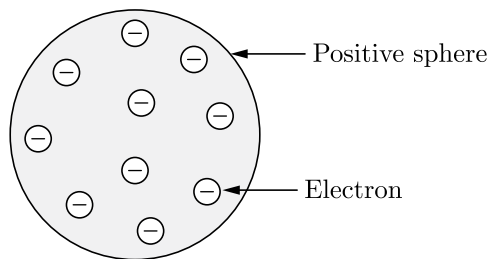
36. Large amount of food grains get spoiled every year in India due to improper storage of food grains. How can this be avoided?

## 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.

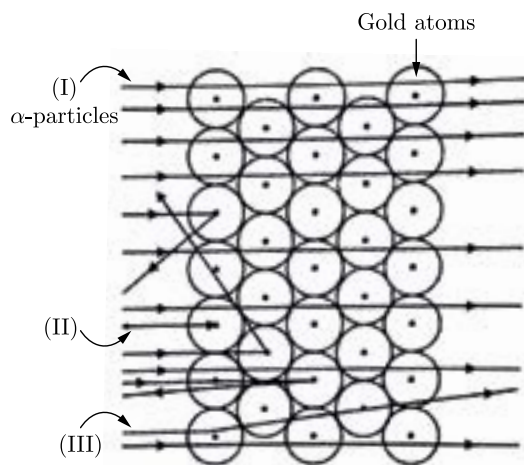
37. The atom is divisible and contains three smaller particles in it. On the basis of experimental observations, different models have been proposed for the structure of an atom. Firstly Thomson's gives the atomic model which is known as raisin pudding model. According to this model atom can be considered as a large sphere of uniform positive charge with a number of small negatively charged electrons scattered throughout it. After the Thomson model, Rutherford discover the nucleus of atom in our experiment.

- (i) What is relation between the mass number  $A$ , atomic number  $Z$  and number of neutrons  $n$ ?  
(ii) Who was the first one to propose a model for the structure of an atom?  
(iii) Which model of an atom is depicted by the given figure ?



- (iv) What is the observation of the given figure?

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or

(v) Who was known as the 'Father' of nuclear physics?

**38.** The cells of connective tissue are loosely spaced and embedded in an inter-cellular matrix. The nature of matrix differs in concordance with the function of the particular connective tissue. Blood is a type of connective tissue. Blood flows and transports gases, digested food, hormones and waste materials to different parts of the body. Bone is another example of a connective tissue. It is a strong and non-flexible tissue. Two bones are connected to each other by another type of connective tissue called the ligament. Another type of connective tissue, cartilage, has widely spaced cells. Areolar connective tissue is found between the skin and muscles, around blood vessels and nerves and in the bone marrow. It fills the space inside the organs, supports internal organs and helps in repair of tissues. Fat-storing adipose tissue is also a type of connective tissue.

- (i) What are the three loose connective tissues?
- (ii) What are areolar tissue junctions?
- (iii) What is the function of fibroblast in areolar tissue?
- (iv) What is present inside plasma?

or

(v) What is adipose tissue?

**39.** Basically momentum is a measure of quantity of motion possessed by a body. It helps to measure the impact of force exerted by a body on another. Consider an example a car and a bicycle are moving with same velocity. The impact of force exerted by this car on an object is much greater than that of bicycle. This is because car has greater mass than bicycle. Similarly, when two trucks of same mass, moving with velocity  $v_1$  and  $v_2$  ( $v_1 > v_2$ ), strike a surface, the impact of force exerted by truck moving with greater velocity is more.

Both the above cases make it clear that the quantity of motion possessed by a body is directly proportional to its mass as well as velocity. Momentum of a body is defined as the product of its mass and velocity.

The rate of change in momentum of a body is directly proportional to the unbalanced force acting on it, and the momentum change occurs in the direction of applied force.

- (i) Which quantity is proportional to the momentum of a body of given mass ?
- (ii) How much force acts on a body whose momentum ( $p$ ) is constant with time ( $t$ )?
- (iii) What happens if velocity is doubled?
- (iv) Can objects with different masses have the same momentum?

or

(v) What is the mathematical expression of Newton's second law?

□□□□□□



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