

Class – IX
Final Examination
(2022-2023)
Science



Date : 11.03.2023

Time : 3 hrs

Roll No:

M.M. : 80

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 questions carrying 02 marks each. Answer 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. Answer to these questions should be in the range of 50 to 80 words.
- vi) 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.
- vii) 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. Identify the incorrect statement.
 - a) The building blocks of all matter are atoms.
 - b) Atoms are very small. They cannot be seen by the naked eye.
 - c) The size of an atom is expressed in metres.
 - d) An atom of hydrogen has the radius of the order of 10^{-10} m.
2. 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.
3. Elements belonging to different groups of the periodic table are given below. If the element *X* forms a chloride whose formula is ' XCl_2 ' then element '*X*' belongs to the group whose representative element is
 - a) Al
 - b) Na
 - c) Mg
 - d) Si

11. The inertia of an object causes the object to
- decrease its speed
 - Increase its speed
 - resist any change in the state of its motion
 - decelerate due to friction
12. The organelle that is called the powerhouse of the cell is _____.
- Golgi bodies
 - Lysosomes
 - Mitochondria
 - Ribosome
13. Vacuoles provide:
- Rigidity
 - Turgidity
 - Shape
 - Both (a) and (b)
14. Which of the following statements is incorrect?
- Some tissues in plants divide throughout their lifespan.
 - Animals have more dead tissues as compared to plants.
 - Cells in animals are more uniform as compared to plants.
 - There is no demarcation of dividing and non-dividing regions in animals.
15. A student was asked to write the characteristic feature of a nerve cell, after viewing it under the microscope. What will be the correct feature?
- A cell body with branched cytoplasmic extensions at one end and a long projection at the other end
 - Oval cells with lobed nucleus
 - Loosely packed cells floating in matrix
 - Spindle-shaped cells with bands
16. Given below is a list of different types of muscles in a human body,
- Smooth
 - Striated
 - Cardiac
 - Skeletal
- Which of the above-mentioned muscles are termed involuntary?
- (i) & (ii)
 - (i) & (iii)
 - (ii) & (iii)
 - (ii) & (iv)

Direction (Q. no. 17-20) are Assertion-Reason based questions.

These consist of two statements- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below

- Both A and R are true and R is the correct explanation of A**
- Both A and R are true but R is not the correct explanation of A**
- A is true but R is false**
- A is false but R is true**

17. **Assertion :** The distribution of electrons in different orbits or shells is governed by a scheme known as Bohr-Bury scheme.

Reason : Electrons are filled in the shells in a stepwise manner in increasing order of energy of the energy shell.

18. **Assertion :** An object may acquire acceleration even if it is moving at a constant speed.

Reason : With change in the direction of motion, an object can acquire acceleration.

19. **Assertion :** Inter cropping prevents pests.

Reason : Plant pests can be controlled biologically by their natural parasites and pathogens.

20. **Assertion :** Fish and few other varieties of aquatic animals are used as food.

Reason : Fish and other varieties of sea food constitute good source of protein.

Section-B

(Q. no. 21 to 26 are very short answer questions)

21. An element E has a valency of 4.



i) What will be the formula of its chloride?



ii) What will be the formula of its sulphide?



OR

An element X shows two valencies of 3 and 5. Work out the formulae of two oxides of this element.

22. If the velocity of an object is doubled. What will be change in its kinetic energy?

23. Name the tissues for the following:

- Stores fat in animal body.
- Divides and re-divides to grow in plants.
- Tissue that joins bone to bone.
- Covers the external surface of animal body.

24. A group of students completed the project of finding the botanical names of all the trees present in the school campus. They prepared metal plates with names carved on it, to fix it on the plant trunks. Shreya was concerned that if the metal plate is fixed into tree many cells of the tree may get damaged. But the group members explained her that the outer layer of trunk does not have living cells and there won't be any damage to the tree.

a) What type of cells are present on the outer layer of the bark/tree trunk?

b) How does the cork act as a protective tissue?

25. Write a paragraph in your own words on each of the following:

- Preparation of soil
- Sowing

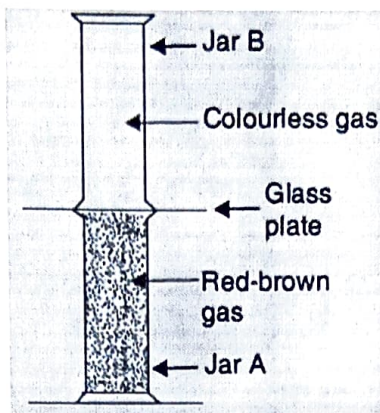
26. If cells of onion peel and RBC are separately kept in hypotonic solution, what will happen to each of them? Explain the reason for your answer.

- Both the cells will swell.
- RBC will burst easily while cells of onion peel will resist the bursting to some extent.
- (a) and (b) both are correct.
- RBC and onion peel cells will behave similarly.

Section-C

(Q. no. 27 to 33 are short answer questions)

27. Look at the diagram given below. Jar A contains a red-brown gas whereas jar B contains a colourless gas. The two gas jars are separated by a glass plate placed between them



- What will happen when the glass plate between the two jars is pulled away ?
- What name is given to the phenomenon which takes place ?
- Name the brown gas which could be in jar A.
- Which is the colourless gas most likely to be present in jar B ?
- Name one coloured solid and one colourless liquid which can show the same phenomenon.

OR

When a beam of sunlight enters a room through a window, we can see tiny particles X suspended in a gas (or rather a mixture of gases) Y which are moving rapidly in a very haphazard manner.

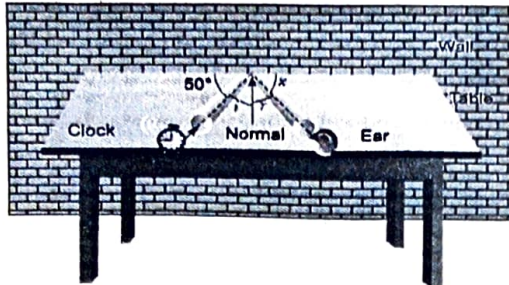
- What could particles X be ?
- Name the gas (or mixture of gases) Y.
- What is the phenomenon exhibited by particles X known as?
- What is causing the movement of particles X?
- What conclusion does the existence of this phenomenon give us about the nature of matter ?

28. When the solid A is added to water, it dissolves with the evolution of a lot of heat and making little explosions to form two products B and C. The properties of products B and C are entirely different from those of solid A as well as water. Moreover, products B and C cannot be reconverted into solid A and water. When another solid D is added to water, it dissolves with the absorption of a little heat to form a product E which cools down. The product E shows the properties of both, solid D as well as water. Moreover, product E can be converted into solid D and water.

- What type of change occurs when solid A is dissolved in water ? Why ?
- What type of change occurs when solid D is dissolved in water ? Why ?
- Name a metal which you think could behave like solid A. Also name the products B

and C.

- d) Name the solid D if it is the one which is used in making ordinary dry cells.
e) Name the process by which D can be recovered from E.
29. a) Why do we hear the sound produced by the humming bees while the sound of vibrations of pendulum is not heard?
b) For hearing the loudest ticking sound heard by the ear, find the angle x in the figure.



the path of sound
is perpendicular to the wall

OR

- Write the difference between transverse waves and longitudinal waves.
30. Suppose that the radius of the earth becomes twice of its original radius without any change in its mass. Then what will happen to your weight?
31. Name and state one function each of different types of meristematic tissue and draw diagram to show their location.
32. A paralytic patient was unable to walk. 'The family member of the patient took the utmost care of the patient.'
- a) Name two tissues responsible for the movement of a body.
b) Name the tissues present in brain and spine.
c) What value of the family members is seen in the above case?
33. Give the formulae of the compounds formed from the following sets of elements :
- a) Calcium and Fluorine
b) Hydrogen and Sulphur
c) Nitrogen and Hydrogen

Section-D

(Q. no. 34 to 36 are long answer questions)

34. a) Bromine occurs in nature mainly in the form of two isotopes ${}_{35}\text{Br}^{79}$ and ${}_{35}\text{Br}^{81}$. If the abundance of ${}_{35}\text{Br}^{79}$ isotope is 49.7% and that of ${}_{35}\text{Br}^{81}$ isotope is 50.3%. Calculate the average atomic mass of bromine.
b) Which two of the following atomic species are isotopes of each other and which two are isobars?
 ${}_{90}\text{Z}^{231}$, ${}_{91}\text{Z}^{230}$, ${}_{88}\text{Z}^{230}$, ${}_{90}\text{Z}^{233}$

OR

- a) Hydrogen has three isotopes written as :
 ${}_{1}\text{H}^1$, ${}_{1}\text{H}^2$, ${}_{1}\text{H}^3$
Explain why :

- i) these isotopes have almost identical chemical properties.
 - ii) they are electrically neutral.
- b) Give reasons for the following :
- i) Isotopes of an element are chemically similar.
 - ii) An atom is electrically neutral.
 - iii) Noble gases show least reactivity.

35. a) What is active transport? Differentiate between active and passive transport.
- b) Draw a labelled diagram of mitochondria. Write the functions of mitochondria.
- c) Draw a labelled diagram of Neuron.

OR

- a) Draw a neat diagram of plant cell and label any three parts which differentiate it from animal cell.
- b) How will absence of any one of the cell organelle affect the cell's working?
- c) Write a note on Golgi apparatus and the functions it performs.

36. a) A body of mass 300 g kept at rest breaks into two parts due to internal forces. One part of mass 200 g is found to move at a speed of 12 m/s towards the east. What will be the velocity of the other part?
- b) Derive the mathematical relation of Newton's second law of motion.

OR

- c) Derive all three equations of motion by graphical method.

Section-E

(Q. no. 37 to 39 are case-based/data-based questions with 3 to 4 short sub-parts.

Internal choice is provide in one of these sub-parts)

37. The knowledge of valencies of various radicals helps us to write the formulae of chemical compounds. The total positive charge on positive ions (cations) is equal to the total negative charge on negative ions (anions) in a molecule. Therefore, in writing the formula of a compound, the positive and negative ions are adjusted in such a way that the total number of positive charges of positive ions (cations) becomes equal to the total number of negative charges of negative ions (anions). There is another simple method for writing the formulae of ionic compounds. In this method, the valencies (or positive or negative charges) of the ions can be 'crossed over' to give subscripts. The purpose of crossing over of charges is to find the number of ions required to equalise the number of positive and negative charges.

- i) Element X has two valencies 5 and 3 and Y has valency 2. The elements X and Y are most likely to be respectively

a) Copper and Sulphur	b) Sulphur and Iron
c) Phosphorus and Fluorine	d) Nitrogen and Iron.
- ii) The formula of the sulphate of an element X is $X_2(SO_4)_3$. What will be the formula of nitride of element X .

iii) An atom of element E contains 3 protons, 3 electrons and 4 neutrons :

- a) What is its atomic number?
- b) What is its mass number?

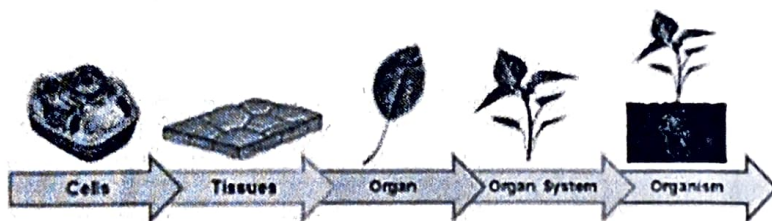
OR

An element has atomic number 13 and an atomic mass of 27.

- a) How many electrons are there in each atom of the element?
- b) How are these electrons distributed in the various energy levels?

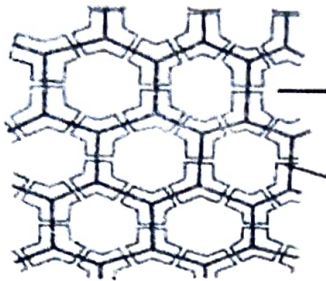
38. Read the following any answer any four questions:

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.



1. The flexibility in plants is due to
 - a) collenchyma
 - b) parenchyma
 - c) chlorenchyma
 - d) aerenchyma
2. Function of aerenchyma:
 - a) It performs photosynthesis
 - b) It helps the aquatic plant to float
 - c) It provides mechanical support
 - d) none of these
3. Which of the following tissues has dead cells?
 - a) Parenchyma
 - b) Sclerenchyma
 - c) Collenchyma
 - d) Epithelial tissue
4. Which of the following statement is incorrect
 - I. Parenchyma tissues have intercellular spaces.
 - II. Collenchymatous tissues are irregularly thickened at corners.
 - III. Apical and intercalary meristems are permanent tissues.
 - IV. Meristematic tissues, in its early stage, lack vacuoles, muscles
 - a) (I) and (II)
 - b) (II) and (III)
 - c) (III) and (I)
 - d) Only (III)

5. Which of the following is the function of the tissue which is shown in the below diagram?



- a) Transpiration
b) Provides mechanical support
c) Provides strength to the plant parts
d) None of these

39. Sound bounces off a solid or a liquid like a rubber ball bounce off a wall. Like the light, sound gets reflected at the surface of a solid or liquid and follows the same laws of reflection.

The directions in which the sound is incident and is reflected make equal angles with the normal to the reflecting surface at the point of incidence, and the three are in the same plane. If we clap near a suitable reflecting object such as a tall building or a mountain, we will hear the same sound again a little later. This sound that we hear is called an echo. The sensation of sound persists in our brain for about 0.1 s. To hear a distinct echo the time interval between the original sound and the reflected one must be at least 0.1s. Hence, for hearing distinct echoes, the minimum distance of the obstacle from the source of sound must be 17.2 m. This distance will change with the temperature of air. Another phenomenon of reflection of sound is reverberation.

A sound created in a big hall will persist by repeated reflection from the walls until it is reduced to a value where it is no longer audible. The repeated reflection that results in this persistence of sound is called reverberation. Excessive reverberation is highly undesirable.

- i) Which of the following is true related to the reflection of sound?
- a) Directions in which the sound is incident and is reflected make equal angles with the normal to the reflecting surface at the point of incidence.
b) Incident wave reflected wave and normal lies in the same plane
c) Both a and b are true.
d) None of these
- ii) For hearing distinct echoes, the minimum distance of the obstacle from the source of sound must be
- a) 10m
b) 20m
c) 17.2m
d) None of these
- iii) Excessive reverberation is
- a) Desirable phenomenon
b) Undesirable phenomenon
c) Does not exist
d) None of these

iv) A person makes a sound near an obstacle and heard the echo after 1 s. What is the distance of the obstacle from the person if the speed of the sound, v is taken as 346 m/s?



$$\begin{array}{r} 36 \\ 8 \\ \hline 44 \end{array}$$

$$\begin{array}{r} 64 \\ 86 \\ 497 \\ \hline 79 \\ 17 \\ \hline 4473 \\ 3479 \times \\ \hline 39263 \end{array}$$

$$\begin{array}{r} 503 \\ 81 \\ \hline 503 \\ 4024 \times \\ \hline 40743 \end{array}$$

$$\begin{array}{r} 40743 \\ 39263 \\ \hline 80006 \end{array}$$