

SET-A

No. of printed pages / Questions:8/39

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Class: IX
Subject: Science

MM: 80
Time: 3 Hrs .

(Fifteen minutes extra will be given for reading the question paper.)

General Instructions:

This question paper consists of 39 questions in 5 sections.

- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section A consists of 20 objective type questions carrying 1 mark each.
- 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.
- Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words
- Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
- Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION-A

1. An object is put one by one in three liquids having different densities. The object floats with $\frac{1}{9}$, $\frac{2}{11}$ and $\frac{3}{7}$ parts of their volumes outside the liquid surfaces in the liquids of densities d_1, d_2, d_3 respectively. Which of the following statement is correct?
(a) $d_1 < d_2 < d_3$ (b) $d_1 > d_2 > d_3$
(c) $d_1 = d_2 = d_3$ (d) $d_1 < d_2 > d_3$
2. A body moving in a circle of radius r covers $\frac{3}{4}$ th of the circle. The ratio of distance to displacement is
(a) $3:2\sqrt{2}$ (b) $3\pi:2\sqrt{2}$
(c) $3\sqrt{2}:2\pi$ (d) $2\sqrt{2}:3\pi$
3. How much time will be required to perform 520 J of work at the rate of 20 W?
(a) 24s (b) 16s
(c) 20 s (d) 26 s
4. A force produces acceleration of 5 cm s^{-2} when it acts on a body of mass 20g. Find the force acting on the body.
(a) $2 \times 10^{-3} \text{ N}$ (b) $4 \times 10^{-3} \text{ N}$
(c) $1 \times 10^{-3} \text{ N}$ (d) $5 \times 10^{-3} \text{ N}$
5. Two particles are at some distance . If the mass of each of two particles is doubled and distance between them is halved then value of gravitational force between them will be
(a) 4 times (b) 6 times
(c) 8 times (d) 16 times

6. A source emits sound of frequency 600Hz inside water. The speed of sound in water is 1500 m/s and in air is 300m/s .The frequency heard in air will be
 (a)300Hz (b)120Hz
 (c)600Hz (d)6000Hz
7. An atom of each element has a definite combining capacity known as
 (a) Tendency (b) Charge
 (c) Electronic configuration (d) Valency
8. Number of neutrons present in hydrogen atom are
 (a) 1 (b) 2
 (c) 3 (d) 0
9. Conversion of gaseous state to solid state is called...
 (a) Deposition (b) Sublimation
 (c) Vaporization (d) Evaporation
10. Mixture of water and milk shows.....
 (a) Solubility (b) Diffusion
 (c) Tyndall effect (d) Brightening
11. If the solution is 400 ml and solvent is 300ml so what is percentage of solute...
 (a) 30 (b) 40
 (c) 45 (d) 25
12. Solid carbon dioxide stored under.....
 (a) High temperature, high pressure (b) High volume, high pressure
 (c) High pressure, low temperature (d) Low temperature, high volume
13. Which structure provides support and protection to plant cells?
 (a) Nucleus (b) Cell wall
 (c) Cell membrane (d) Cytoplasm
14. Which organelle is responsible for protein synthesis?
 (a) Endoplasmic reticulum (b) Golgi apparatus
 (c) Lysosomes (d) Mitochondria
15. Which structure contains genetic material and controls cell activities?
 (a) Nucleus (b) Cell wall
 (c) Cell membrane (d) Cytoplasm
16. Nervous tissue is not found in
 (a) brain (b) spinal cord
 (c) tendons (d) nerves

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below:

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

(d) A is false but R is true.

17.Assertion: Work done by coolie on luggage while moving in a horizontal platform is zero.

Reason: The force applied by the coolie and displacement are in the same direction.

18.Assertion: Liquids diffuses more easily as compared to gases.

Reason: Intermolecular forces are greater in liquids than in gases.

19.Assertion: Legumes increases the soil fertility.

Reason: Microbes in the root nodules of leguminous plants fix atmospheric nitrogen.

20.Assertion: Some weeds produce substances toxic for the crops.

Reason: Weeds take up nutrients and reduce the growth of crops.

SECTION-B

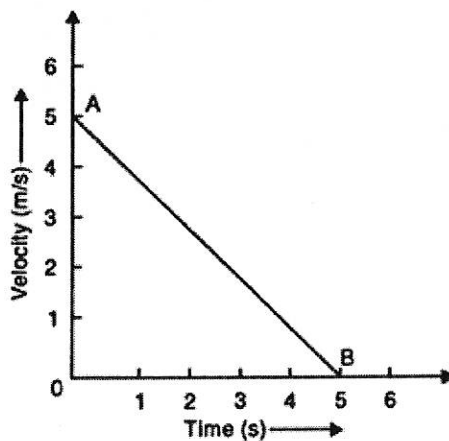
21. A body moving with uniform acceleration has initial and final velocities 20ms^{-1} and 30ms^{-1} when passing through A and B point respectively. Find the average velocity of it.

22.(a) Differentiate between balanced and unbalanced forces.

(b) What is inertia of rest? Give an example

OR

The velocity time graph of a ball of mass 30g moving along a straight line is shown in below figure. Calculate the opposing force that brings the ball to rest.



23. A solution of urea in water contains 16 grams of it in 120 grams of solution. Find out the mass percentage of the solution.

24. An element 'X' contains 6 electrons in 'M' shell as valence electrons:

(i) What is the atomic number of 'X'?

(ii) Identify whether 'X' is a metal or non-metal.

OR

(i) Give the names of the elements present in the following compounds:

(a) Quicklime

(b) Hydrogen sulphide.

(ii) The atomic number of lithium is 3 its mass number is 7. How many protons and neutrons are present in a lithium atom?

25.(i) How is prokaryotic cell different from a eukaryotic cell?

(ii) Which organelle is known as the powerhouse of the cell? Why?

26. What are the differences between broilers and layers and in their management.

SECTION-C

27.(i) Assuming that the mass of earth is 100 times larger than that of Moon and radius of Earth is about 4 times as that of Moon, show that the weight of an object on Moon is one-sixth of that on Earth.

(ii) A boy on a cliff 49m high drops a stone. One second later he throw another stone. Both the stone hit the ground at same time. With what speed is the second stone thrown?

OR

(i) A cubical block of each side 2cm is lying on the ground. If its mass is 2kg the find pressure exerted by the block on the ground.

(ii) The density of an turpentine at 293K is given as 870kg/m³. Identify and write the name of substance that sink in turpentine at same temperature. Give reason for your answer.

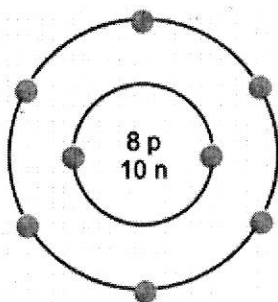
| Sl. No. | Substance | Density(kg/m ³) |
|---------|--------------|-----------------------------|
| 1 | Wood | 690 |
| 2 | Ice | 920 |
| 3 | Rubber | 970 |
| 4 | Parrafin Wax | 900 |
| 5 | Cork | 240 |
| 6 | Bone | 1850 |

28.(i) An ultrasonic wave is sent from a ship towards the bottom of sea. It is found that the time interval between the sending and receiving of wave is 1.6s. What is depth of sea, if the velocity of sound in sea water is 1400m/s?

(ii) What is longitudinal waves? How it formed? Explain using diagram.

(iii) Write two difference between ultrasonic and infrasonic sound.

29.(i) The given figure depicts the atomic structure of an atom of an element 'X'.



Write the following information about the element 'X'.

(a) Atomic number of 'X'

(b) Atomic mass of 'X'

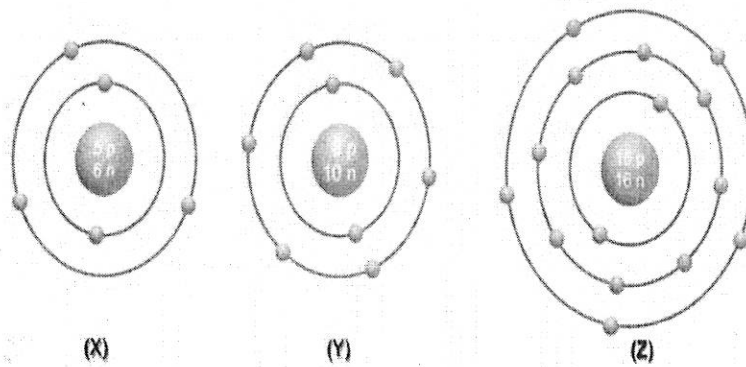
(c) Valence electrons

(d) Symbol of element

(ii) Water as ice has a cooling effect, whereas water as steam may cause severe burns. Explain these observations.

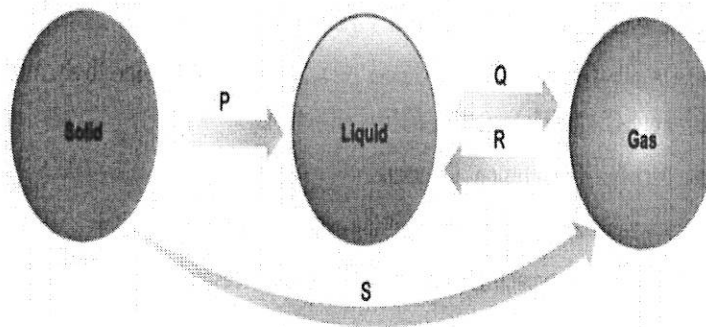
OR

(i) What information do you get from the figures about the atomic number, valency of atoms X, Y and Z? Give your answer in a tabular form.



(ii) Why are we able to sip hot tea or milk faster from a saucer rather than a cup? Explain.

30. (i) Name the changes in the terms of process P, Q, R and S



(ii) It is a hot summer day, Priyanshi and Ali are wearing cotton and nylon clothes respectively. Who do you think would be more comfortable and why?

31. Give three characteristic features of simple permanent tissue.

OR

Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and site/location in the body.

32. (i) How does Amoeba obtain its food?

(ii) Explain different types of meristematic tissues with well labeled diagram.

- 33.(i)What are the advantages of composite fish culture?
(ii)Explain any one method of crop production which ensures high yield.

SECTION-D

- 34.(i)State Archimedes principle.
(ii)What is law of conservation of energy? Name the energy transformation taking place in a car engine.
(iii)A body of mass 5kg is thrown vertically upward with speed 20ms^{-1} . (Take $g= 10\text{ms}^{-2}$)
(a) When does its potential energy becomes maximum and what is its value
(b) When does its Kinetic energy becomes maximum and what is its value

OR

- (i)Define one Watt.
(ii)Write an expression of average power.
(iii)If the momentum of body is doubled , the kinetic energy becomes _____.
(iv)Write the conditions when it is said that a work is done.
- 35.(i)The average atomic mass of a sample of an element X is 16.2 u. What are the percentages of isotopes $^{16}_8\text{X}$ and $^{18}_8\text{X}$ in the sample?
(ii) Why do helium, neon and argon have a zero valency?
(iii) Calculate the molecular mass of the following:
(a) H_2CO_3 (b) NH_4Cl

OR

- (i)Write atomicity of the following:
(a) Sulphur (b) Phosphorus
(ii) Write the formula of the compounds formed by the ions Mg^{2+} and S^{2-} . Name the compounds formed .
(iii) Identify the dispersed phase and dispersing medium in the following colloids.
(a) Fog
(b) Cheese
(iv) An unknown substance 'A' on thermal decomposition produces 'B' and 'C'. What is 'A' an element, a compound or a mixture?
36. (i)Give a brief account of the discovery of the cell.
(ii)Write down the differences between diffusion and osmosis.
(iii)Why lysosomes are known as suicidal bag of cell?

OR

- (i) Name the following:
(a) Smallest cell organelle
(b) Largest cell organelle;
(c) ER studded with ribosomes
(d) Functional segments of the DNA molecule.
(ii)Enumerate functions of the plasma membrane.
(iii)Describe the structure of stomata with well labeled diagram.

SECTION –E

37. Sound bounces off a solid or a liquid like a rubber ball bounces 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 the 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?

38. Read the passage and answer the following questions

Atoms and molecules are the building blocks of matter. An atom is the smallest unit of an element that retains its chemical properties, while a molecule is a group of two or more atoms held together by chemical bonds. Atoms consist of a positively charged nucleus, which contains protons and neutrons, surrounded by negatively charged electrons in energy levels or shells. The number of protons in an atom determines its atomic number and defines its unique identity as an element. The electrons in an atom occupy specific energy levels, and the outermost shell is known as the valence shell. Atoms gain, lose, or share electrons to achieve a stable electron configuration, forming chemical bonds and giving rise to molecules. Understanding the concept of atoms and molecules is crucial for comprehending various chemical reactions and the composition of substances.

- (i) What is the smallest unit of an element that retains its chemical properties?
- (ii) What is a group of two or more atoms held together by chemical bonds called?
- (iii) What is valance shell? Give example.

OR

What do atoms do to achieve a stable electron configuration

39. Honey is widely used and therefore bee keeping for making honey has become an agricultural enterprise. Since bee-keeping needs low investments, farmers use it as an additional income generating activity. In addition to honey, the beehives are a source of wax which is used in various medicinal preparations. The local varieties of bees used for commercial honey production are *Apis cerana indica*, commonly known as the Indian bee, *A. dorsata*, the rock bee and *A. florae*, the little bee. An Italian bee variety, *A. mellifera*, has also been brought in to increase yield of honey. The Italian bees have high honey collection capacity. They sting somewhat less. They stay in a given beehive for long periods, and breed very well. For commercial honey production, bee farms or apiaries are established. The value or quality of honey depends upon the pasturage, or the flowers available to the bees for nectar and pollen collection. In addition to adequate quantity of pasturage, the kind of flowers available will determine the taste of the honey.

- (i) Which species of bee is commonly known as the Indian bee?
- (ii) Which species of bee is commonly known as the rock bee?
- (iii) Which species of bee is commonly known as the little Bee?
- (iv) Enlist the local varieties of bees used for commercial honey production.
