

ANNUAL EXAMINATION (2023-2024)

CLASS - IX

SCIENCE

Time: 3 hrs.

Max. Marks: 80

General Instructions:

- i. This question paper consists of 39 questions in 5 sections.
- ii. Section A consists of 20 objective type questions carrying 1 mark each.
- iii. 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.
- iv. 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.
- v. 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.
- vi. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts

SECTION -A

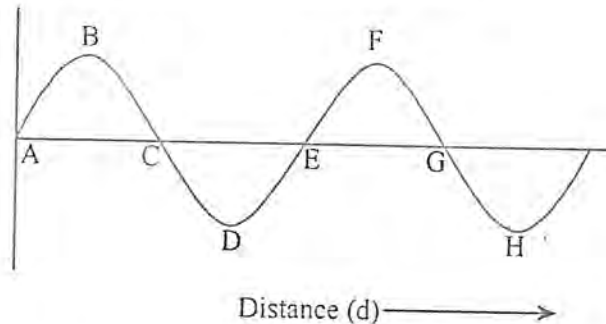
Select and write one most appropriate option out of the four options given for each of the questions 1 – 20.

1. Choose the correct formula c 1
 - a) K_2CO_3
 - b) $CaCO_3$
 - c) $Ca(CO_3)_2$
 - d) Ca_2CO_3
2. The formula unit mass of $K_2Cr_2O_7$ (At mass of K=39u, Cr=52u and O=16u) 1
 - a) 44 u b) 332u c) 294u d) 107u
3. Choose the correct explanation for the following statement:
It is easy to move our hands through air but not through a wooden block: 1
 - a) Interparticle space is very large and intermolecular force is very small in solids
 - b) Air has low intermolecular force of attraction and less interparticle space.
 - c) Air and wooden block both has large intermolecular space
 - d) Air has large intermolecular space and negligible intermolecular forces of attraction.
4. The atomic number of an element with completely filled 'L' shell is: 1
 - a) 2 b) 10 c) 18 d) 12
5. The mass of sodium sulphate required to prepare 10% solution in 100g of water 1
 - a) 11.1g b) 90g c) 1.11g d) 10g
6. Which of the following statements is true about $^{14}C_6$, $^{15}N_7$, $^{16}O_8$? 1
 - a) They have equal number of protons
 - b) They have equal number of electrons
 - c) All three have equal mass number
 - d) All three have equal number of neutrons

7. What happens when the temperature of ice is increased above 0°C ? 1
 a) The molecules gain kinetic energy and ice changes into water
 b) The molecules lose kinetic energy and ice changes into water
 c) The molecules gain kinetic energy and ice changes into vapour
 d) The molecules lose kinetic energy and ice changes into vapour
8. The proteins and lipids, essential for building the cell membrane, are manufactured by 1
 a) endoplasmic reticulum b) golgi apparatus
 c) centrosomes d) mitochondria
9. Select the incorrect statement 1
 a) The movement of water across a semi permeable membrane is affected by the amount of substances dissolved in it.
 b) Membranes are made of organic molecules like proteins and lipids
 c) Golgi bodies are involved in the synthesis of plastids.
 d) Cell wall constitutes cellulose in plants
10. Plasmolysis in a plant cell is defined as 1
 a) break down (lysis) of plasma membrane in hypotonic medium
 b) shrinkage of cytoplasm and cell contents in hypertonic medium
 c) shrinkage of cell wall in hypertonic medium
 d) cell membrane extended outward to the cell wall and exerting pressure on it.
11. Match the contents of column A with column B 1
- | COLUMN A | COLUMN B |
|-----------------------------------|------------------|
| A) Husk of coconut | p) Cork Cells |
| B) Waxy layer upon leaf surface | q) Phloem Tissue |
| C) Sieve tube and companion cells | r) Sclerenchyma |
| D) Bark of tree trunk | s) Cuticle |
- a) A-s, B-r, C-p, D-q
 b) A-r, B-p, C-q, D-s
 c) A-r, B-s, C-q, D-p
 d) A-q, B-p, C-r, D-s
12. Three different cropping patterns, viz. X, Y and Z are applied to get the maximum benefits from a crop field. In X, two or more crops are grown together in the same field in different rows or strips. In Y also, two or more crops are grown together but not in definite rows. In Z, different crops are grown on a piece of land in a pre-planned succession. These cropping patterns maintain soil fertility and crop yield. Select the option that correctly identifies any two of these cropping patterns. 1
 a) X- Mixed cropping, Y- Intercropping
 b) X- Intercropping, Z- Crop rotation
 c) Y- Mixed cropping, Z- Intercropping
 d) X- Mixed cropping, Z- Crop rotation
13. To hear a distinct echo distance between the source and the reflecting surface must be: 1
 a) 34.4m
 b) 34m
 c) 17.2m
 d) 70m

14. Two bodies have equal weight and are kept at heights of h and $1.5h$ respectively. The ratio of their potential energies is
- 3:2
 - 2:3
 - 1:1
 - 4:3

15. In the curve shown in figure the wavelength is



- a) AC b) FG c) DE d) BF
16. A ship rises when it enters from river to sea, because:
- The force of buoyancy decreases
 - The force of buoyancy increases
 - The volume of ship increases
 - The mass of ship decreases

Q. no 17 to 20 are Assertion - Reasoning 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 and R is not the correct explanation of A
- A is true but R is false
- A is False but R is true

17. Assertion (A): A gas exerts pressure on the walls of the container in which it is placed. Reason (R): Gas has very low density.
18. Assertion (A): As plants grow older, the outer protective tissue undergoes certain changes to provide strength. Reason (R): The cells from meristem form the bark.
19. Assertion (A): The inner mitochondrial membrane is highly folded to form cristae. Reason (R): They increase the surface area for ATP synthesis.
20. Assertion (A): The value of 'g' is greater at the poles than at the equator. Reason (R): Radius is more at the equator than at the poles.
21. a) Animals of colder regions have a thicker layer of sub-cutaneous fat. Name the tissue that will be prominent in this part.
b) Why is it difficult to pull out the husk of a coconut? Relate the answer to the characteristic feature of tissue in it.

22.

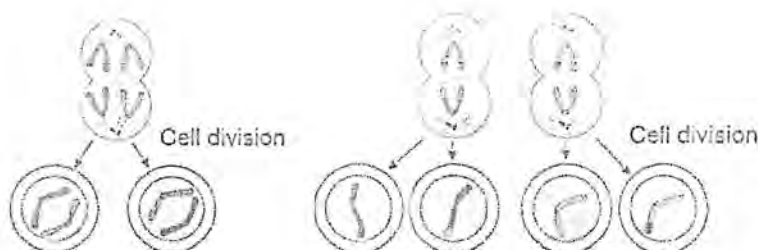


Fig 'I'

Fig 'II'

- Name the two types of cell division shown in the figure.
- Compare the two types of cell division in relation to number of chromosomes in the daughter cells.

23.

'X' substance is found in aerated drinks. It shows the following change when temperature and pressure are changed.



- Identify the substance X.
- Name and define the process

24. Observe the image given below and answer the following questions:



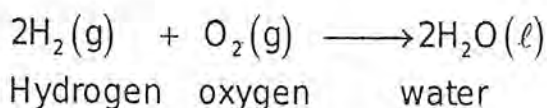
- Name the type of solution shown in each beaker.
- Compare the the two solutions on the basis of particle size of the solutes in each case.

- Mention any two differences between mass and weight.
- What is the weight of object on moon if the mass of object is 10kg on earth? ($g=9.8\text{m/s}^2$)

- Name the type of energy in a stretched rubber band.
- A bag of rice weighs 400kg. What height should it be raised to, so that its potential energy is 98000 joules? ($g = 9.8 \text{ m/s}^2$)

SECTION-C

- State an example in each case and represent them with chemical formula
 - A molecule of an element with atomicity 4,
 - A molecule having three different kind of atoms.
 - A divalent polyatomic anion.
- Observe the chemical change carefully.



The following properties are shown by one of the pure substances involved in the

chemical change.

i. It has a fixed composition throughout the substance.

ii. Its properties are different from its constituents

iii. It can be divided into simpler substances by chemical means

iv. It always combines in a definite ratio by mass

a) Name the pure substance and also categorise it as an element or a compound.

b) Which of the property agrees with law of constant proportion? Explain by taking proper example.

c) How many grams of oxygen has completely reacted with 4g of hydrogen to form 36 gms of water?

29. a) Draw neat labelled diagram of tissues specified below:

i) living tissue that provides mechanical support in plants

ii) animal tissue with elongated cells and contractile proteins responsible for movement.

b) Name the following:

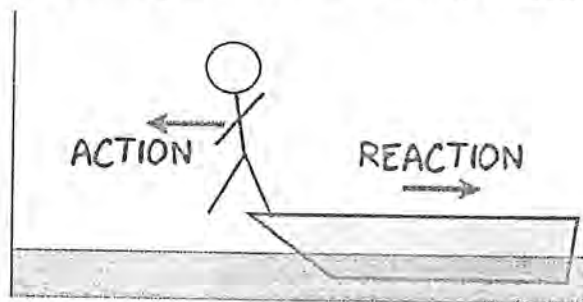
i) The tissue that performs the functions of binding, supporting, and packing together different organs of the body of an animal.

ii) Substances deposited in cork cells to make it impervious to gases and water.

30. a) What is meant by composite fish culture? What criteria should be considered while selection of fishes in this culture? 3

b) How does the pasturage affect the taste of honey in different places?

31. Observe the picture given below and answer the following questions: 3



a) Name and state the law which is depicted in the above diagram.

b) Explain why the runner presses the ground with his feet before he starts his run.

c) An automobile vehicle has a mass of 1500 kg. what must be the force between the vehicle and road, if the vehicle is to be stopped with a negative acceleration of 1.7m/s^2 ?

32. a) Flash and thunder are produced simultaneously. But why is the thunder heard a few seconds after the flash is seen? 3

b) Why do we hear more clearly in room with curtains than in room without curtains?

c) How is it that bats are able to fly at night without colliding with other objects.

33. a) Define SI unit of pressure.

b) Why is the depression much more when a man stands on the cushion than when he lies down on it. 3

c) A piece of steel has a volume 12 cm^3 and a mass of 96 g. Determine the density of steel?

SECTION-D

34. a) What information do you get from the figures about the atomic number and valency of atoms shown below? 5

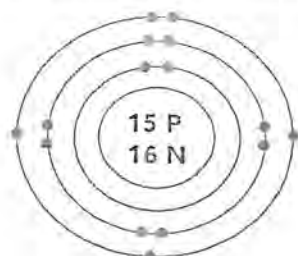


figure A

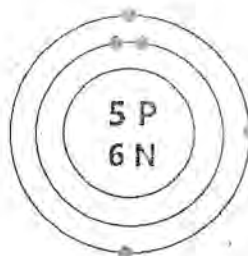
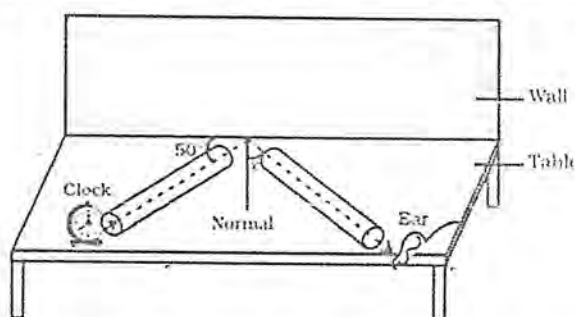


figure B

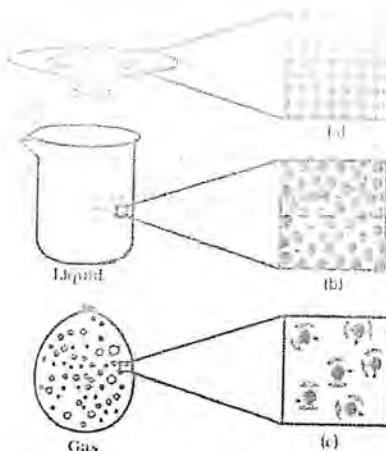
- b) What is an isotope? Give a suitable example.
 c) Determine the number of neutrons of an element with atomic number 18 and atomic mass 40.
35. a) Both green manure and vermicomposting have played a significant role in making organic farming a success. How are both these manures different from each other. 5
 b) Highlight any two environmentally friendly practices in agricultural practices for protecting the crops against weeds and pests.
 c) What is meant by genetically modified crops?
 d) What are the desired agronomic characters for fodder and cereal crops?
36. Observe the image carefully and answer the following question: 5



- a) For hearing the loudest ticking sound heard by the ear, find the angle x in the figure.
 b) Explain any two applications of reflection of sound.
 c) A person clapped his hands near a cliff and heard the echo after 6 s. What is the distance of the cliff from the person if the speed of the sound is 342 m/s?

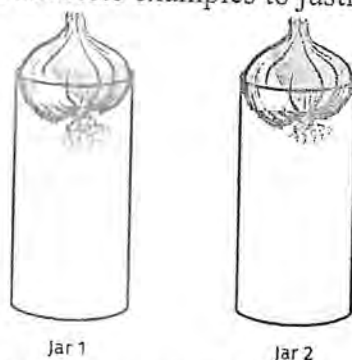
SECTION-E

37. Gases are highly compressible as compared to solids and liquids. The liquefied petroleum gas (LPG) cylinder that we get in our home for cooking or the oxygen supplied to hospitals in cylinders is compressed gas. Compressed natural gas (CNG) is used as fuel these days in vehicles. The liquid takes up the shape of the container in which they are kept. Liquids flow and change shape, so they are not rigid but can be called fluid. Solids and liquids can diffuse into liquids. The aquatic animals can breathe underwater. The rate of diffusion of liquids is greater than solid. 4



- a) A large amount of air can be filled into the small volume of cycle tube. Explain
 b) Why does the smell of perfume spread everywhere when the bottle of perfume is opened in one corner of the room?
 c) Interconvertibility of states of matter is extremely beneficial in our daily life. Give two concrete examples to justify the statement.

38.



4

The growth of Onion roots were observe and measured in both the jars on day 1, 2 & 3. On day 4 the root tips of the onion bulb was cut by half a centimetre. The growth of the roots was measured for a few more days.

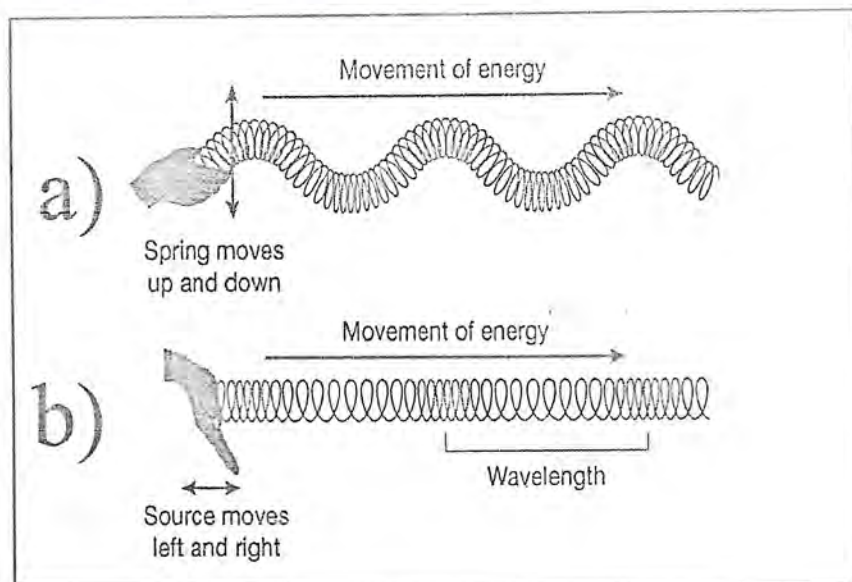
Length of the root of an onion bulb

Length	Day 1	Day 2	Day 3	Day 4	Day 5
Jar 1	3	3.5	4	4.5	5
Jar 2	3	3.5	4	4*	4

* Root tip removed on day 4

- i) Which of the following options marks the difference in observation noted on Day 5 in both the Jars 1 and 2 in relation to growth of root tips.
- Roots stop growing after sometime.
 - No difference is seen in the root growth of the two jars
 - Roots in jar 1 are longer
 - Roots in jar 2 are longer
- ii) This investigation of removing the root tip led to the removal of which type of meristematic tissue? And how did it affect the growth of root tips?
- iii) Define the term Cell differentiation.
- iv) Why do meristematic cells lack any vacuole?

39. a) Rajiv moved the spring in two ways as shown in the diagram given below. Based on your concept of 'sound', answer the following questions: 4



- Name the type of wave in case a) and case b).
- Write one difference in both the types of waves in part (i).
- Draw case (b) again and mention compression and rarefaction in it.
- A bat can hear sound wave of frequency up to 120000Hz. Determine the wavelength of the sound in air at this frequency. Take the speed of sound in air as 344 m/s.