

SECOND SEMESTER
MODEL QUESTION PAPER YEAR 2024-25

GRADE : IX

TIME: 3 HRS.

MARKS: 70

SUB: SCIENCE

GENERAL INSTRUCTIONS: Read the following instructions carefully and strictly follow them:

1. There are 49 questions in the question paper. All questions are compulsory.
2. Questionn No. 1 to 35 are multiple choice questions carrying one mark each.
3. Question No. 36 to 44 are short answer type (i) question, carrying two mark each.
4. Question No. 45 to 47 are short answer type (ii) questions, carrying 3 marks each.
5. Question No. 48 to 49 are long answer type questions, carrying 4 Marks each.
6. There is no overall choice in the question paper. However, an internal choice has been provided for 3 questions of 2 marks, 2 questions of 3 marks and one question of 4 marks. .

PART – I (MULTIPLE CHOICE QUESTIONS)

Select the most correct alternative from those given below each statement.

1.The molecular formula of calcium carbonate is:

- $\text{Ca}(\text{CO}_3)_2$
- $\text{CaH}(\text{CO}_3)_2$
- $\text{Ca}(\text{HCO}_3)_2$
- CaCO_3

2. The atomic mass of Hydrogen is 1u, Nitrogen is 14 u, and that of oxygen is 16 u then the Molecular mass of HNO_3 is:

- 69 u
- 68 u
- 65u
- 63 u

3. The number of atoms present in a molecule of $\text{Al}_2(\text{SO}_4)_3$ is :

- 9
- 13
- 14
- 17

4. The ratio by mass of carbon and oxygen in a molecule of carbon dioxide is:

- 1:8
- 3:8
- 14:3
- 14:8

5. According to the atomicity of the element chlorine is diatomic. What would be the atomicity of phosphorous?

- monoatomic
- diatomic
- tetra-atomic
- Poly –atomic

6. The electronic configuration of magnesium atom is :

- 3, 8, 1
 - 1, 8, 3
 - 2, 8, 2
 - 8, 2, 2
7. The particles that determine the mass of an atom is:
- Electrons and protons
 - Protons and neutrons
 - Neutrons and electrons
 - Protons, neutrons and electrons
8. The maximum number of electrons that can be accommodated in 'M' shell of an atom is:
- 32
 - 26
 - 18
 - 2
9. In Rutherford's experiment it was observed that very few alpha particles bounce back in the same path after striking the gold foil. The conclusion drawn from this observation was:
- there is no empty space in the atom
 - nucleus is negatively charged
 - atom contains only electrons
 - all positive charge and the mass of the atom is concentrated in a small volume within an atom
10. The credit for the discovery of electron and proton goes respectively to:
- E. Goldstein and J.J. Thomson
 - J.J. Thomson and E. Goldstein
 - J. Chadwick and E. Goldstein
 - J.J. Thomson and J. Chadwick
11. The number of electrons in the outermost orbit of an inert gas element is :
- 2 or 8
 - 7 or 8
 - 2 or 7
 - 3 or 8
12. Canal rays are radiations consisting of :
- Positively charged particles
 - Negatively charged particles
 - Neutral particles
 - Cathode rays
13. If "n" is the number of the orbit, the number of electrons in the orbit is given by the formula:
- n^2
 - $2n^2$
 - $3n^2$
 - $4n^2$
14. Neutrons are present in the nuclei of all atoms except :
- Hydrogen
 - Helium

- Lithium
- sodium

15. The frequency which is not audible to the human ear is:

- 30 Hz
- 300 Hz
- 3000 Hz
- 30000 Hz

16. When a body falls freely towards the earth, then its total energy:

- Increases
- decreases
- remains constant
- first increases then decreases

17. When you compress a spring you do work on it, then the elastic potential energy:

- Increases
- decreases
- disappears
- remains unchanged

18.. In case of a negative work, the angle between the force and displacement is:

- 0 degree
- 45 degrees
- 90 degrees
- 180 degrees

19. If you lift a block of mass 1 kg through a distance of 1 m in 2 seconds, what is the work done? ($g=9.8 \text{ m/s}^2$)

- 19.6 J
- 9.8 J
- 4.9 J
- 2.5 J

20. The unit of work is joule. The other physical quantity that has same unit as joule is:

- power
- velocity
- energy
- force

21. If 20 waves are produced in 2 seconds, what is the frequency in hertz?

- 40 Hz
- 20 Hz
- 10 Hz
- 1 Hz

22. A wave is generated at one end of the slinky of length 10 m. The wave returns back to its point of generation in 10 seconds. The speed of the wave in the slinky will be:

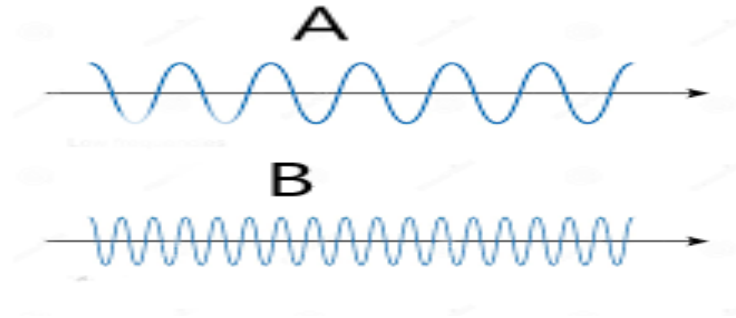
- 4 m/s
- 3 m/s
- 2 m/s
- 1 m/s

23. When the speed of a moving object is doubled its:

- kinetic energy is doubled
- kinetic energy remains the same
- kinetic energy becomes half
- kinetic energy increases four times

24. The figure below shows snapshots of two waves (A, B). Both the figures are drawn in the same scale:

Which of the following statement is true?



- wave **A** has shorter wave length and higher pitch than the wave **B**
- wave **B** has shorter wave length and higher pitch than wave **A**
- wave **A** and wave **B** has same wave length and same pitch
- wave **B** has longer wave length and higher pitch **than** wave **A**

25. Using a slinky:

- both transverse wave as well as longitudinal wave can be generated
- both types of waves cannot be generated
- only a transverse wave can be generated
- only longitudinal wave can be generated

26. The frequency of a wave whose time period is 0.05 seconds is :

- 20 Hz
- 10 Hz
- 5Hz
- .05 Hz

27. Two biologically important compounds that both contain oxygen and nitrogen are:

- Carbohydrates and fats
- Carbohydrates and protein
- Protein and nucleic acids
- Protein and lipids

28. Soil erosion can be prevented by:

- Raising forests
- deforestation
- excessive use of fertilizers
- over grazing by animals

29. Major source of minerals in the soil is/are:

- plants
 - animals
 - bacteria
 - the parent rock from which soil is formed
30. Many of the marine animals use carbonates dissolved in sea water to make their:
- gills
 - scales
 - shells
 - fins
31. Marked temperature difference in aquatic environment can affect::
- breeding of fishes
 - more growth of aquatic animals
 - process of digestion
 - availability of nutrients
32. If there was no atmosphere around the earth, the temperature of the earth will:
- increase
 - go on decreasing
 - increase during the day and decrease during the night
 - be unaffected
33. Surface of the moon, with no atmosphere, the temperature ranges from:
- -270°C to -200°C
 - -190°C to 110°C
 - -100°C to 200°C
 - 0°C to 210°C
34. In large parts of India, rains are mostly brought by the:
- south west or north east monsoons.
 - west south or east north monsoons
 - south east or north west monsoons
 - north south or east west monsoons
35. Choose the correct sequence for biological nitrogen fixation:
- Nitrogen fixation → Ammonification → Nitrification → Denitrification
 - Nitrification → Ammonification → Nitrogen fixation → Denitrification
 - Nitrogen fixation → Nitrification → Ammonification → Denitrification
 - Denitrification → Nitrification → Ammonification → Nitrogen fixation

PART – II (SUBJECTIVE)

36. What are binary compounds? Write the molecular formulae of calcium chloride and ammonium Sulphate
37. Draw a schematic atomic structure of an atom of magnesium and of neon to show the distribution of electrons in different orbits.
38. Calculate the number of particles in each of the following:
- (a) 46 g of Na atoms (b) 8 grams of O_2 molecules
39. State any two features of Rutherford's model of an atom
40. Write an expression for the work done when a force is acting on an object in the direction of its displacement. When do we say one joule of work is done?

OR

40. Write an expression for the kinetic energy of an object. What are the energy transformations that occur when you are riding a bicycle?

41. Draw the diagram of bell jar experiment showing sound cannot travel in vacuum and label switch and electronic bell.

42. Differentiate between an echo and a reverberation. Give one example of each.

OR

42. Distinguish between loudness and intensity of sound. State the unit of loudness.

43. Describe the role of sun and water in the formation of soil. .

OR

43. Modern agricultural practices cause soil pollution. Explain with the help of two examples

44. When do we say that work is done? What are the necessary conditions for work to be done?

45. Complete the following table by writing the correct values in places marked as A, B, C, D, E, F and G.

Atomic number	Mass number	Number of Neutrons	Number of Electrons	Number of Protons	Name of the Element
-----A----- --	1	-----B----- ---	1	1	Hydrogen
-----C-----	24	12	12	-----D----- --	Magnesium
11	23	-----E-----	11	11	-----G----- ----

46. (i) Distinguish between Atoms and molecules.

(ii) A 0.24 g sample of compound of oxygen and boron was found by analysis to contain 0.096 g of boron and 0.114 g of oxygen . Calculate the percentage composition of the compound by weight.

OR

46. (i) Distinguish between cations and anions .

(ii) Hydrogen and oxygen combine in the ratio of 1:8 by mass to form water . What mass of oxygen gas would be required to react completely with 2.5 g of hydrogen gas ?

47.. Draw the schematic diagram of oxygen cycle in nature. List any two activities that you think would lead to air pollution.

OR

47. Draw the schematic diagram of water cycle in nature. List two human activities that can impact water cycle

48. Establish the relationship between speed of sound, its wavelength and frequency. If the speed of sound in air is 340 m/s. Calculate;

(i) Wavelength when frequency is 170 Hz

(ii) Frequency when wavelength is 2 m

(iii) Why are sound waves are classified as mechanical wave

49. 75 kg missile is dropped downwards from an air, and has a speed of 20m/s at an altitude of 160 m above the ground. Determine: [Consider, $g = 10 \text{ m/sec}$]

(i) The kinetic energy possessed by the missile at 160 m.

(ii) The potential energy by the missile at 160 m.

(iii) The total mechanical energy possessed by the missile.

(iv) The kinetic energy and velocity with which it strikes the ground.

OR

49. Calculate the electricity bill amount for a month of 30 days, if the following devices are used as specified:

(i) 2 bulbs of 40 W for 6 hours

(ii) 2 tube lights of 50 W for 8 hours

(iii) A TV of 120 W for 6 hours

Given the cost of electricity is Rupees 2.50 per unit.