

BUDHA DAL PUBLIC SCHOOL PATIALA
Final Examination (12 March 2025)
CLASS IX
PAPER- SCIENCE (SET-B)

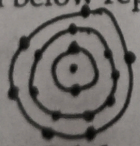
M.M. 80

Time: 3 hr.

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. Answers 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. Answers 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

- Q1. Evaporation is a phenomenon where as boiling is a phenomenon. (1)
a) Bulk, surface b) Surface, bulk c) Fast, slow d) none of these
- Q2. On Kelvin scale 59°C is equal to: (1)
a) 330 K b) 332 K c) 335 K d) 331 K
- Q3. Which of the following statement is always true when a substance undergoes physical change? (1)
a) It change colour
b) A new substance is formed
c) It boils
d) Its composition remains the same
- Q4. A solution can be called a dilute, concentrated depending upon the amount of present in a (1)
a) Solute, solvent b) Solvent, solution c) Solute, solution d) none of these
- Q5. The same proportion of carbon and oxygen in CO_2 obtained from different source proves the law of (1)
a) Reciprocal proportion b) Conservation of mass
c) multiple proportion d) Constant proportion
- Q6. The diagram given below represent an atom of (1)

a) Chlorine b) Sulphur c) Aluminium d) Phosphorus
- Q7. An element 'X' has a valency of 2. The chemical formula of its oxide is (1)
a) X_2O_3 b) XO_3 c) XO d) none of these

B-1

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- Q8. Scientist who coined the term 'cell'
- Robert Hooke
 - Schleiden and Schwann
 - Robert Brown
 - Leeuwenhoek
- (1)
- Q9. The undefined nuclear region of prokaryotes is also known as
- Nucleus
 - Nucleolus
 - Nucleic acid
 - Nucleoid
- (1)
- Q10. Rohan examined the cheek cell and made observation. The correct feature of cheek epithelium is :
- Absence of cell wall, nucleus and plastid
 - Absence of nucleus, plastids
 - Absence of cell wall, plastids and intercellular spaces
 - Absence of intercellular spaces and nucleus
- (1)
- Q11. Blubber in whales is, infact, an
- adipose tissue
 - aerolar tissue
 - dense regular connective tissue
 - cartilage
- (1)
- Q12. Which of the following are exotic breeds?
- Brown
 - Jersey
 - Brown swiss
 - Jersey swiss
- (i) and (iii)
 - (ii) and (iii)
 - (i) and (iv)
 - (ii) and (iv)
- (1)
- Q13. The area under velocity - time graph gives
- Acceleration
 - Speed
 - Retardation
 - Displacement
- (1)
- Q14. Match Column I with Column II and choose appropriate option from the codes given below:

Column I

- Acceleration
- Momentum
- Force
- Mass

Column II

- Kg
- N
- Kg ms^{-1}
- m/s^2

- A - 3, B - 4, C - 1, D - 2
- A - 4, B - 1, C - 2, D - 3
- A - 4, B - 3, C - 2, D - 1
- A - 1, B - 2, C - 3, D - 4

- Q15. A body attached to spring balance is put in water. The reading of spring balance.
- decreases
 - increases
 - remains unchanged
 - may increase or decrease
- (1)
- Q16. Two bodies of equal weight are kept at heights of h and 1.5h, respectively. The ratio of their potential energy is
- 3:2
 - 2:3
 - 1:1
 - 4:3

For the following questions, two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- Both A and R are true and R is the correct explanation of the assertion.
- Both A and R are true but Reason R is not a correct explanation of Assertion.
- A is true but R is false.
- A is false but R is true.

B-2

Assertion : Path of light is not visible in solution. (1)
Reason: Particles of solution do not scatter light due to very small size. (1)

Assertion : A cell membrane shows fluid behaviour. (1)
Reason: A membrane is a mosaic of lipids and proteins. (1)

Assertion : To hear a distinct echo the time interval between the original sound and the reflected one must be at least 0.1 sec. (1)
Reason : The sensation of sound persists in our brain for about 0.1 sec. (1)

Assertion : Ciliated epithelium helps in movement of particles. (1)
Reason : Cilia helps in movement. (1)

Section - B

Q21. What are the main features of Bohr Model of atom? (2)

Q22. Define the following giving one example of each (2)
a) Emulsion b) Heterogeneous mixture

Q23. Give one reason why? (2)

- a) Muscles of heart are involuntary?
- b) It is difficult to pull out the husk of coconut?

Q24. Differentiate between animal cell and plant cell. (Give two points) (2)

OR

Name the cell organelles for the following:

- a) Packaging and dispatching unit of the cell
- b) Suicidal bags of the cell

Q25. A man throws a ball of mass 0.8kg vertically upward with a velocity of 20 m/s. (2)
What will be its initial momentum? What would be its momentum at the highest point of its reach?

OR

Why does a boat tend to leave the shore, when passengers are alighting from it?

Q26. A bus starting from rest moves with a uniform acceleration of 0.1 m/s^2 for 2 minutes. Find (i) the speed acquired (ii) the distance travelled (2)

Section - C

Q27. Give reasons. (3)

- a) Sponge though compressible is a solid.
- b) Gases have highest rate of diffusion among all three states of matter.
- c) Write (i) and (ii) on the arrows showing change of state

Solids state $\xrightleftharpoons[\text{(ii)}]{\text{(i)}}$ Liquid state

Q28. a) Calculate Molecular mass of following

H_2SO_4 given (Atomic mass of H = 1u, S = 32u, O = 16u)

b) Write names of the compounds represented by following formulae

(i) AlCl_3 (ii) CaCO_3

c) Hydrogen and oxygen combine in the ratio 1 : 8 by mass to form water. What mass of oxygen gas would be required to completely react with 3gm of hydrogen gas?

- Q29. a) What type of tissue is cartilage?
b) What is matrix of cartilage made up of?
c) Write one function of tendon. (3)
- Q30. a) Why do raisins and apricots swell up when placed in water? Explain and name the phenomenon involved. (3)
b) When swollen raisins and apricots are put in concentrated sugar solution, what will happen to them? Explain and also name the phenomenon.
- Q31. a) Define 1W of power
b) The kinetic energy of an object of mass, m moving with a velocity of 5m/s is 25J . What will be its kinetic energy when its velocity is tripled? (3)
- Q32. a) Derive an expression for acceleration due to gravity in terms of mass of earth (M) and universal gravitational constant. (3)
b) At what place on the Earth's surface is the weight of a body maximum? (poles/equator)
- Q33. a) Name the devices based on Archimedes' Principle. (3)
b) When an object is immersed in a fluid, name the two forces acting on it.
c) Draw diagrams to represent soft sound and loud sound.

Section - D

- Q34. The composition of the Nuclei of two atomic species X and Y are given as (5)
a) X and Y is given as

	X	Y
Protons	6	6
Neutrons	6	8

Give the Mass number of X and Y.

- b) i) Define Isobar. Give example.
ii) What is common in isobars?
c) An element P has protons 14, electrons 14 and neutrons 28.

Answer the following:

- i) What is the distribution of electron in element P?
ii) What is its valency?
iii) Write the name and symbol of element.

OR

- a) On the basis of the following table answer the following questions:

Element	Mass No.	Atomic No.
A	3	4
B	9	10
C	13	14
D	17	18
E	18	22

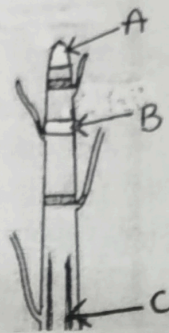
- i) What is number of protons in an atom of D?
ii) Which is an inert gas?
iii) Which atom will form positively charged ion?
iv) Which element has Mass number equal to 35?

- b) An element has 11 protons and 11 electrons. What is the distribution of electrons and name the valence shell of this element? (5)

- a) Define composite fish culture?
b) What is the problem associated with it and how it can be solved?
c) What are leucoplasts? Give their function.

OR

- a) Label the parts A, B, C



- b) Write the function of part C.
c) Differentiate between Xylem and Phloem. (Give 3 points)

- Q36. (a) Why the stage of an auditorium has curved background, curtains, carpets and false ceiling? (5)
(b) The wavelength of waves produced on the surface of water is 20 cm. If the wave velocity is 24m/s. Calculate (i) the number of waves produced in one second.
(ii) the time required to produce one wave.
(c) Name the principle on which the stethoscope works.

OR

- a) What is a sound board? Explain the working of sound board with the help of labelled diagram.
b) Why do we hear the sound produced by the humming bees while the sound of vibrations of pendulum is not heard?
c) If any explosion takes place at the bottom of a lake, what type of shock waves in water will take place?

Section - E

- Q37. Read the passage and answer the following questions : (4)

Molecules are the essential building blocks of life. Without water molecules, life on Earth would not exist. All living organisms need protein molecules for structure and function. Therefore, an understanding of how atoms combine to form molecules is key to understanding the origins of life. An atom or a molecule can lose or gain electron(s) to form an ion. When an atom/molecule gains negatively charged electron(s), a negative ion is formed. When an atom/molecule loses negatively charged electron(s), a positive ion is formed. A molecule is a neutral particle, composed of a set number of atoms bonded together. The particle of the substance is the molecule, rather than the atoms that make up the molecule. By contrast, ionic compounds are made up of an indeterminate number of ions, in a fixed ratio. The particle of the ionic substance remains the ion.

- a) What is atomicity of ozone?
b) How many atoms are there in H_2SO_4 .
c) Give one word for (i) Negatively charged ion (ii) positively charged ion
d) What are polyatomic ions? Give example.

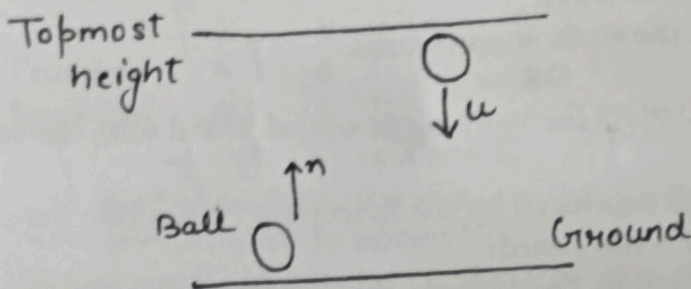
Different crops require different climatic conditions for growth and completion of their life cycle. Growth of plants and flowering are dependent on sunlight.

1. What are Rabi crops? (1)
2. Which is not a Kharif crop? (1)
 - a) Rice b) Maize c) Soyabean d) Wheat
3. What is Rabi season period? (1)
 - a) November to March b) November to April
 - c) November to January d) November to February
4. Which one is not a source of carbohydrate? (1)
 - a) Rice b) Millets c) Sorghum d) Gram

Q39.

Read the passage and answer the following questions :

A ball is thrown vertically upwards. When it rises, the gravitational force does negative work on it, decreasing its kinetic energy. As the ball descends, the gravitational force does positive work on it, increasing its kinetic energy. The ball falls back to the point of projection with same velocity and kinetic energy with which it was thrown up. The net work done by the gravitational force on the ball during the round trip is zero because work done by the gravity on displacing a body from one point to another point depends only on the end positions of the body.



- a) Answer the following questions.
 - i) Why do we say work done against gravity is negative?
 - ii) A man is holding a suitcase at his hand at rest. What is work done by him?
- b) Name the energy of the ball which remains same during round trip of the ball.
- c) A ball is thrown vertically upwards with an initial velocity of 20 m/s. Calculate the maximum height reached by the ball. (Assume the acceleration due to gravity is 9.8 m/s^2)

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CLASS IX

PAPER- SCIENCE (SET-A)

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Section - A

- Q1. Which condition out of the following will increase the evaporation of water? (1)
- a) Increase in temperature of water
 - b) Decrease in temperature of water
 - c) Less exposed surface area of water
 - d) Adding common salt to water.
- Q2. On Celsius scale 400K is equal to (1)
- a) 227 °C b) 27 °C c) 127 °C d) 100 °C
- Q3. Which of the following is a chemical change? (1)
- a) Melting of butter in a pan
 - b) Water boiling to form steam in a container
 - c) Dissolving common salt in water
 - d) Burning of paper
- Q4. Which of the following will show 'Tyndal Effect'? (1)
- i) Salt solution ii) Copper sulphate solution iii) Milk iv) Starch solution
- a) i & iv b) i, ii c) iii, iv d) iv only
- Q5. The atom is indivisible was proposed by (1)
- a) Einstein b) Lavoisier c) Dalton d) Proust
- Q6. An element 'X' has a valency of 3 formula of its carbonate is (1)
- a) XCO_3 b) $X_3(CO_3)_2$ c) $X_2(CO_3)_3$ d) X_3CO_3
- Q7. The diagram given below represents an atom of (1)



- a) Lithium b) Neon c) Beryllium d) Nitrogen

A-1

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13C 5G

- Q8. Cell theory was given by
 a) Schleiden and Schwann
 b) Virchow and Hooke
 c) Hooke and Schwann
 d) Haeckel and Schleiden (1)
- Q9. The two arms of each chromosomes are termed
 a) chromatin fibres b) centromeres c) chromatids d) none of these (1)
- Q10. Rohan examined the onion peel and made observation. The incorrect observation is (1)
 a) Intercellular space is absent
 b) Cell wall is present
 c) Nucleus is present
 d) Cell wall is absent
- Q11. The pinnae of ears have
 a) bone b) cartilage c) elastic fibres d) collagen fibres (1)
- Q12. Which of the following are Indian cattle?
 i) *Bos indicus* ii) *Bos domestica* iii) *Bos bubalis* iv) *Bos vulgaris*
 a) (i) and (iii) b) (i) and (ii) c) (ii) and (iii) d) (iii) and (iv) (1)
- Q13. The slope of velocity - time graph gives
 a) Distance b) The displacement c) The acceleration d) The speed (1)
- Q14. Match Column I with Column II and choose appropriate option from the codes (1)
 given below:

Column I	Column II
A) Momentum	1. Kg
B) Acceleration	2. N
C) Mass	3. Kg ms^{-1}
D) Force	4. m/s^2
(a) A - 3, B - 4, C - 1, D - 2	b) A - 1, B - 2, C - 3, D - 4
(c) A - 4, B - 1, C - 2, D - 3	d) none of these

- Q15. An object weighs 10N in air. When immersed fully in water, it weighs only 8N. The weight of water displaced by object will be: (1)
 (a) 2N (b) 8N (c) 10N (d) 12N
- Q16. A body of mass 1 kg has a potential energy of 1 joule relative to the ground, when it is at a height of (1)
 a) 0.102m b) 1m c) 9.8 m d) 32 m

For the following questions, two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

- a) Both A and R are true and R is the correct explanation of the assertion.
 b) Both A and R are true but Reason R is not a correct explanation of Assertion.
 c) A is true but R is false.
 d) A is false but R is true.

- Q17. Assertion : Pure substance have fixed melting point. (1)
Reason: The properties of compounds are similar to those of its components. (1)
- Q18. Assertion : Cell wall is a non-living part of the cell. (1)
Reason: It offers protection, definite shape and support. (1)
- Q19. Assertion : Speed of wave = Wavelength/ Time period (1)
Reason : Wavelength is the distance between two consecutive compressions or two consecutive rarefactions. (1)
- Q20. Assertion : The inner lining of intestine has tall epithelial cells. (1)
Reason : Columnar epithelium facilitates absorption and secretion. (1)

Section - B

- Q21. What are the main features of Rutherford's model of an atom. (2)
- Q22. Define the following giving one example of each (2)
a) Homogeneous mixture b) Pure substance
- Q23. Give one reason why? (2)
a) Muscles contain contractile proteins
b) Branches of a tree move and bend freely in high wind velocity.
- Q24. Differentiate between prokaryotic cell and Eukaryotic cell. (Give two points) (2)

OR

Name the cell organelles for the following:

- a) Storage sacs of the cell b) Transporting channels of the cell.
- Q25. A man throws a ball of mass 0.4kg vertically upward with a velocity of 10 m/s. (2)
What will be its initial momentum? What would be its momentum at the highest point of its reach?

OR

Why can a small mass such as a bullet kill a person when fired from a gun?

- Q26. A train is travelling at a speed of 90 km/hr. Brakes are applied so as to produce a uniform acceleration of -0.5 m/s^2 . Find how far the train will go before it is brought to rest. (2)

Section - C

- Q27. Give reasons. (3)
a) Solid carbon dioxide is called dry ice.
b) Our palm feel cool when we put some acetone on it
c) Name B and C in following change of state

Liquid $\xrightleftharpoons[B]{A}$ gas

- Q28. a) Calculate Molecular mass of following
 CH_3COOH given Atomic mass of C = 12u H = 1u O = 16u
b) Write names of the compounds represented by following formulae
(i) Na_2S (ii) CuSO_4
c) In a compound carbon and oxygen react in a ratio 3:8 by mass to form carbon dioxide. What mass of oxygen is required to react completely with 9gm of carbon?

- Q29. a) What type of tissue is bone? (3)
 b) What is hard matrix of bone made up of?
 c) Write one function of ligaments.
- Q30. a) Why does the plant cell, placed in a hypotonic solution, not burst? Explain. (3)
 b) What happens when a fully turgid plant cell is placed in a hypertonic solution? Explain and name the phenomenon. (3)
- Q31. a) Define 1J of work
 b) The kinetic energy of an object of mass, m moving with a velocity of 5m/s is 25J . What will be its Kinetic energy when its velocity is doubled? (3)
- Q32. a) Show that weight of an object on the moon is $1/6^{\text{th}}$ of its weight on the earth. (3)
 b) At what place on the earth's surface is the weight of body minimum? (poles/equator)
- Q33. a) What do you mean by free fall? (3)
 b) State two factors on which buoyant force depends.
 c) Represent graphically, two sound waves having same amplitude but different frequencies.

Section - D

- Q34. The composition of two atoms (5)
 a) X and Y is given as
- | | X | Y |
|-----------|---|---|
| Protons | 8 | 8 |
| Electrons | 8 | 8 |
| Neutrons | 8 | 9 |
- i) What is the mass number of Y?
 ii) What is the atomic number of X?
- b) Define Isotopes. Give example. What is common in isotopes?
- c) An element A has protons 13, electrons 13 and 14 neutrons. Answer the following:
- What is the distribution of electron in element A
 - What is its valency?
 - What type of ion is formed by A
 - Identify the element.

OR

- a) From the given table answer the following:

Element	Mass No.	Atomic No.
A	3	2
B	9	4
C	11	5
D	19	9
E	23	11

A-4

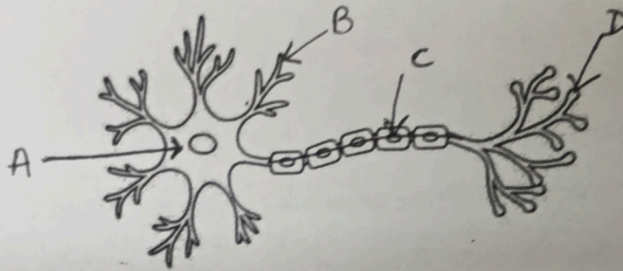
- How many electrons are present in B?
- Which is an inert gas?
 - Which atom will form a negatively charged ion?
 - Which element has 12 neutrons?
 - An element has 17 protons and 17 electrons. What is the distribution of electrons and name the valence shell of this element.

(5)

- What is composite fish culture?
- Write its two advantages.
- What are chromoplasts? Give their function.

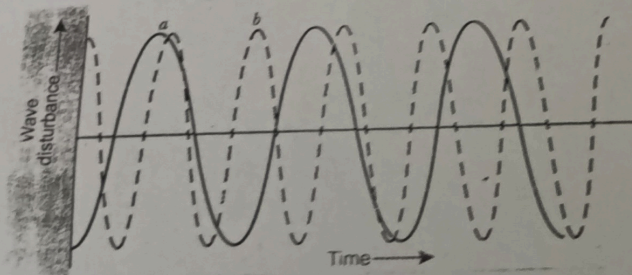
OR

- Label the parts A, B, C, D.



- Differentiate between Tracheids and Vessels. (Give 3 points)

- Q36. (a) A longitudinal wave of wavelength 1cm travels in air with a speed of 330 m/s. Calculate the frequency of the wave. Can this wave be heard by a normal human?
- (b) In the graphs given below representing the human voice, which of the two graphs (a) or (b) is likely to be the male voice? Give reason for your answer.



- Explain one practical application of reflection of sound.

OR

- Explain how defects in a metal block can be detected using ultrasound with the help of diagram.
- Why is the ceiling and wall behind the stage of good conference halls or concert halls made curved?
- Name the sound waves used by bats while flying in the dark.

A-

Section - E

Q37. Read the passage and answer the following questions :

(4)

Molecules are the essential building blocks of life. Without water molecules, life on Earth would not exist. All living organisms need protein molecules for structure and function. Therefore, an understanding of how atoms combine to form molecules is key to understanding the origins of life. An atom or a molecule can lose or gain electron(s) to form an ion. When an atom/molecule gains negatively charged electron(s), a negative ion is formed. When an atom/molecule loses negatively charged electron(s), a positive ion is formed. A molecule is a neutral particle, composed of a set number of atoms bonded together. The particle of the substance is the molecule, rather than the atoms that make up the molecule. By contrast, ionic compounds are made up of an indeterminate number of ions, in a fixed ratio. The particle of the ionic substance remains the ion.

- Name the non metal which is tetra atomic
- How many atoms are there in HNO_3 ?
- What are polyatomic ions? Give example.

Q38. Read the passage and answer the following questions :

(4)

Different crops require different climatic conditions, temperature and photoperiods for their growth and completion of their life cycle. Growth of plants and flowering are dependent on sunlight.

- What are Kharif crops? (1)
- Which is not a rabi crop? (1)
 - Wheat
 - Gram
 - Pea
 - Rice
- What is Kharif season period? (1)
 - June to July
 - June to October
 - June to November
 - June to December
- Which one is not a source of proteins? (1)
 - Gram
 - Pea
 - Bean
 - Wheat

Q39. Read the passage and answer the following questions :

(4)

When an object is allowed to fall from higher level to a lower level, it gains speed due to gravitational pull, i.e., it gains kinetic energy. Therefore, in possessing height, a body has the ability to convert its height into kinetic energy, i.e., it possesses potential energy.

The magnitude of its gravitational potential energy is equivalent to the amount of work done by the weight of the body in causing the descent.

If a mass m is at a height h above a lower level, the P.E. possessed by the mass is mgh . The chosen level from which height is measured has no absolute position. It is, therefore, important to indicate clearly the zero P.E. level in any problem in which P.E. is to be calculated. The potential energy of a body may be positive or negative.

- A cement bag of weight 50 kg has potential energy of 490 J. To what height should it be raised? (1)
- When an arrow is shot from its bow, it has kinetic energy. From where does it get this kinetic energy? (1)
- Define potential energy. What is the potential energy of a stone of mass 5 kg placed at a height of 2 m above the ground? ($g = 9.8 \text{ m/s}^2$). (2)

Section - E

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