

HALF YEARLY EXAMINATION (2026-27)

19

SCIENCE

CLASS-IX

Time Allotted- 3 Hrs.

[Printed pages:7]

M.M-80

Date:21.09.2026

General Instructions:

1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions
3. Questions attempted in wrong section will not be evaluated.

SECTION A

Multiple Choice Questions

- Q1. Which cell organelle is known as the powerhouse of the cell? (1)
a) Ribosome ☒ b) Mitochondria c) Golgi apparatus d) Lysosome
- Q2. The plasma membrane is: (1)
a) Freely permeable ☒ b) Selectively permeable
c) Impermeable d) Non-living
- Q3. Which of the following is present in plant cells but absent in animal cells? (1)
a) Nucleus b) Mitochondria ☒ c) Cell wall d) Cytoplasm
- Q4. A tissue is best defined as: (1)
a) A group of organs performing the same function
☒ b) A group of similar cells performing a specific function
c) A group of organ systems
d) A single specialised cell
- Q5. Which tissue provides flexibility to plants? (1)
a) Sclerenchyma ☒ b) Collenchyma c) Xylem d) Phloem
- Q6. Which component of blood is responsible for transporting oxygen? (1)
a) Platelets b) Plasma c) White blood cells ☒ d) Red blood cells
- Q7. The tissue responsible for the movement of our body is: (1)
a) Nervous tissue b) Epithelial tissue ☒ c) Muscular tissue d) Connective tissue

The following two questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by 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.

(Sci9-1)

Q8. **Assertion (A):** Plant cells generally do not burst when placed in a hypotonic solution. (1)
Reason (R): The rigid cell wall provides resistance to the excessive expansion of the cell.

Q9. **Assertion (A):** Sclerenchyma cells are usually dead at maturity. (1)
Reason (R): Their thick, lignified walls provide mechanical strength to the plant.

Q10. What is osmosis? Give one example of osmosis in everyday life. (2)

Q11. **Attempt either option A or B.**

A. Differentiate between meristematic tissue and permanent tissue on the basis of cell division and structure. (2)

OR

B. What is the function of the plasma membrane? How is it different from the cell wall?

Q12. Draw well labelled diagram of nerve cell. (3)

Q13. Name the three types of muscular tissues found in animals. Write one characteristic and one location of each type. (3)

Q14. Read the following passage carefully and answer the questions that follow:

A student observed an onion peel under a microscope. The cells appeared rectangular and were surrounded by a rigid outer covering. Inside the cell, a large vacuole occupied most of the space, while the nucleus was pushed towards the periphery. The student then observed a cheek cell, which had an irregular shape and lacked the rigid outer covering.

Answer the following:

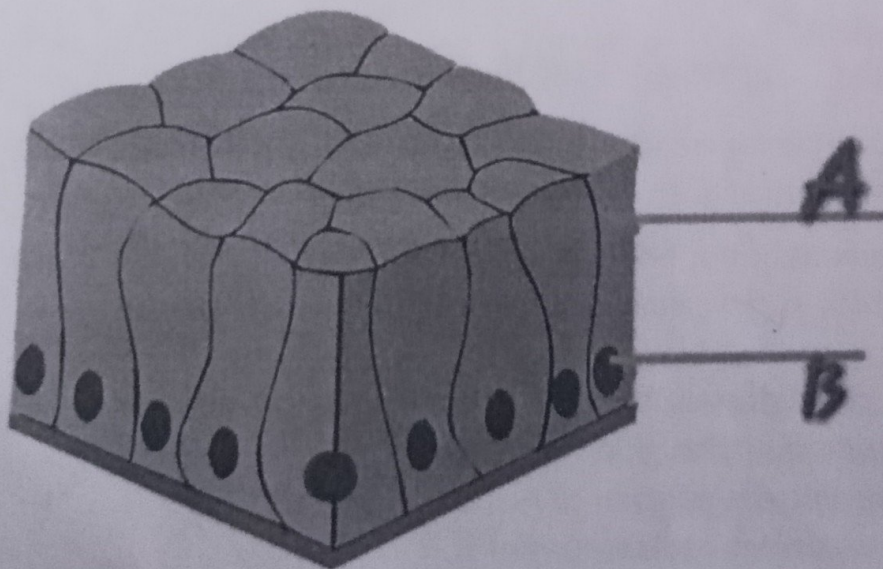
(a) Name the rigid outer covering present in the onion peel cells. (1)

(b) Why is the nucleus pushed towards the periphery in the onion cell? (1)

(c) Give two differences between the onion peel cell and the cheek cell. (2)

Q15. **Attempt either option A or B.** (5)

A. Study the diagram carefully and answer the questions that follow.



(Sci9-2)

- (a) Identify the type of epithelial tissue shown in the diagram.
- (b) Name the structures labelled A and B in the diagram.
- (c) State two functions performed by this tissue.
- (d) Mention one location in the human body where this tissue is found.

OR

- ✓ B. Draw a neat, labelled diagram of a plant cell. Atleast 6 labels.

Then answer the following:

Name the organelle responsible for controlling the activities of the cell and organelle called as "suicidal bags".

SECTION B

Q16. The number of electrons in Cl^- ion are:

- ~~a) 16~~ b) 8 ✓ c) 17 d) 18

(1)

Q17. In Rutherford gold foil experiment, most of the α -rays passed through the atom showing that -

(1)

- ✓ a) Most of the atom is empty
c) Atom is spherical

- b) Atom is positively charged at the centre
d) Atom is neutral

Q 18. Which mixture correctly aligns with their method of separation?

(1)

- a) Oil and water $\rightarrow$ Filtration
✓ c) Salt and water $\rightarrow$ Evaporation

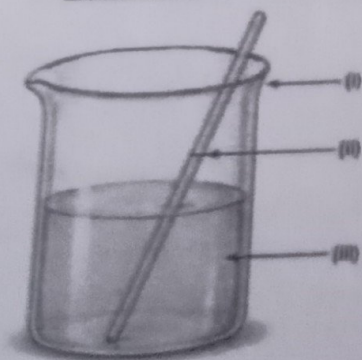
- b) Cream from milk $\rightarrow$ Distillation
d) Salt and sand $\rightarrow$ Centrifugation

Q 19. What is the correct description of i, ii and iii in the following figure related to the preparation of a true solution?

(1)

- ✓ a) i – glass rod; ii – beaker; iii – solution
b) i – beaker; ii – glass rod; iii – solution
c) i – glass rod; ii – solution; iii – beaker
d) i – solution; ii – beaker; iii – glass rod

Preparation of a True Solution



Q20. Match the following and choose the correct option. (1)

Column I	Column II
1) James Chadwick	i) Isobars
2) $^{40}_{18}\text{Ar}$, $^{40}_{20}\text{Ca}$	ii) Neutron
3) Mg^{2+}	iii) Stationary orbits
4) Neil Bohr	iv) $^{12}\text{P}^5$, $^{10}\text{e}^-$

a) 1 - ii, 2 - i, 3 - iv, 4 - iii

b) 1 - i, 2 - ii, 3 - iii, 4 - iv

c) 1 - iv, 2 - iii, 3 - i, 4 - ii

d) 1 - iii, 2 - iv, 3 - ii, 4 - i

Q21. Which ancient Indian philosopher proposed that matter is composed of very small, indivisible particles called 'Paramanu'? (1)

a) Acharya Kanada

b) Democritus

c) John Dalton

d) Ernest Rutherford

Q22. Alloys like brass are: (1)

a) Heterogeneous mixtures

b) Homogeneous mixtures

c) Compounds

d) Elements

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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.

Q23. Assertion (A): Neutron is a neutral particle. (1)

Reason (R): Neutron is sum of electrons and protons.

Q24. Give reason: (2)

a). Atoms are electrically neutral.

b) Noble gases are least reactive.

Q25. Attempt either option A or B. (3)

A. i) Define concentration of a solution.

ii) During an experiment, two students were asked to prepare a 10% m/m solution of salt in water. Rahul dissolved 10 g of salt in 100 g of water while Riya prepared it by dissolving 10 g of salt in water to make 100 g of solution.

a) Compare and calculate mass/mass % in each case.

b) Whose measurements are correct for the experiment.

OR

(Sci9-4)

B. i) Define sublimation process.

ii) Draw a well labelled diagram showing sublimation of camphor.

Q26. Explain Thomson's model of an atom along with a labelled diagram.

(3)

Q27. A group of students studied different types of mixtures in their science lab. They prepared three samples. Sample A: salt dissolved in water; Sample B: sand mixed in water; Sample C: a few drops of milk added to water. When a beam of light was passed through each of the three samples, the beam was invisible in sample A, clearly visible in sample B and C. When left undisturbed, particles in sample B settled down. The teacher explained that air with high levels of smoke and dust can appear hazy due to a similar phenomenon observed in sample C.

(4)

Read the above passage and answer the following:

A. Identify the type of mixture represented by sample B and C.

B. Name and define the phenomenon observed when a beam of light passes through sample B and C.

OR

Which separation technique can be used to separate the components of sample B and sample C

C. Write the properties of sample C (including the particle size).

(5)

Q28. Attempt either option A or B.

A. The atom of an element 'X' has 11 protons, 11 electrons and 12 neutrons.

i) Write the symbolic notation of element 'X' showing its atomic number and mass number.

ii) Write its electronic configuration and valency.

iii) Draw the atomic structure of element X, clearly showing its nuclear composition.

OR

B. i) Define isotopes and give one example.

ii) Give reason why isotopes have similar chemical properties.

iii) The average atomic mass of copper is 63.5 u. It exists as two isotopes, which are $^{63}_{29}\text{Cu}$ and $^{65}_{29}\text{Cu}$. Calculate the percentage of each isotope present in it.

SECTION C

Q.29 Which one of the following is scalar?

~~(a)~~ distance, (b) displacement, (c) uniform velocity, (d) variable velocity,

Q.30 Retardation of a body is:

(a) negative speed of our body

(c) Negative velocity of a body

~~(b)~~ Negative acceleration of a body

(d) None of the above.

(Sci9-5)

Q.31. The following question consists of two statements – Assertion (A) and Reason (R).
Answer these questions by selecting the appropriate option given below: (1)

- 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.

Assertion(A): force may not always produce motion in a body at rest.

Reason(R): In certain cases, force may change the size and shape of our body.

Q.32 Attempt either option A or B. (2)

A. What is Kinetic Energy? Define one Joule of energy.

OR

B. What is Potential Energy? Write the S.I. unit of Potential Energy. (2)

Q.33 Write at least two differences between speed and velocity . (2)

Q.32 What is unbalance force? Explain with an example. (2)

Q.33 Attempt either option A or B. (3)

A. Describe three types of lever with diagram. Also give its example .

OR

B. Explain three types of work done with examples. (3)

Q.34 Derive second equation of motion by graphical method. (3)

Q.35 A student runs from the ground floor to the fourth floor of a school building to collect a book and then comes down to their classroom on the second floor. If the height of each floor is 3 m. Find. (3)

(a) the total vertical distance travelled and

(b) Their displacement from the starting point

Q.38

When we hold a suitcase steady at some height, the forces are balanced and the suitcase is steady. In a tug of war, the forces applied by the two teams are balanced. When we stop pedalling a bicycle, it starts slowing down on account of friction between the tyres and the road. A ball set rolling on the ground stops after some time due to unbalanced force of friction between the ball and the ground.

Newton gave three laws of motion. According to first law, a body continues to be in a state of rest or in a state of uniform motion along a straight line, unless some external unbalanced force is applied on the body. This law defines force and inertia. Inertia is of three types: inertia of rest, inertia of motion and inertia of direction.

Read the above passage and answer the following questions: (4)

1. What kind of forces are involved when we hold a suitcase steady at some height?
2. When we stop pedalling a bicycle, it slows down and finally stops. Why?
3. What is meant by inertia?
4. Why is Newton's first law of motion called Law of Inertia?

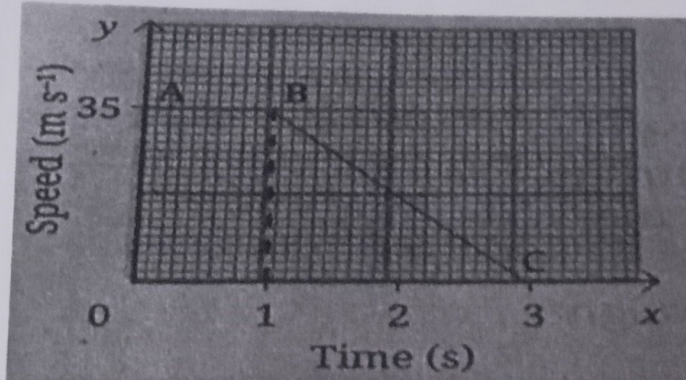
(Sci9-6)

Q39. Attempt either option A or B.

- A. i) During a family road trip, you drive 200 km north in three hours, afterwards you drive 200 km South, in two hours. Find the average speed and average velocity for your entire trip. (3)
- ii) Under what condition(s) is the: (2)
- (a) Magnitude of average velocity of an object equal to its average speed?
 - (b) Magnitude of average velocity of an object is zero, while its average speed is not zero?

OR

B.



A 1000 KG Car is moving along a road at a constant speed. Suddenly, the driver notices some obstruction ahead and applies the brakes to come to a complete stop. The graphical representation of motion of the car starting from the instant the driver spots the traffic ahead is shown in the figure.

- (a) Describe how the car moves between position A and B
- (b) Calculate the kinetic energy of the car at A
- (c) State the work done by the brakes in bringing the car to a halt between B and C
- (d) What does the kinetic energy of the car transform into?

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