

O. P. JINDAL SCHOOL, SAVITRI NAGAR
ANNUAL EXAMINATION (2025 – 2026)

CLASS: IX
Subject: SCIENCE

Time:3 Hours
Max. Marks:80

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.

SECTION A

- Q1.** Which structure provides support and protection to plant cells? **1M**
 (a) Nucleus (b) Cell wall
 (c) Cell membrane (d) Cytoplasm
- Q2.** Which organelle is responsible for protein synthesis? **1M**
 (a) Endoplasmic reticulum (b) Golgi apparatus
 (c) Lysosomes (d) Mitochondria
- Q3.** Which structure contains genetic material and controls cell activities? **1M**
 (a) Nucleus (b) Cell wall
 (c) Cell membrane (d) Cytoplasm
- Q4.** Nervous tissue is not found in **1M**
 (a) brain (b) spinal cord
 (c) tendons (d) nerves
- Q5.** The girth of stem increases due to **1M**
 (a) apical meristem (b) lateral meristem
 (c) intercalary meristem (d) vertical meristem
- Q6.** Which of the following tissues has dead cells? **1M**
 (a) Parenchyma (b) Sclerenchyma
 (c) Collenchyma (d) Epithelial tissue
- Q7.** Which one of the following nutrients is not available in fertilizers? **1M**
 (a) Nitrogen (b) Phosphorus
 (c) Iron (d) Potassium

In the following questions, a statement of assertion (A) is followed by a statement of reason (R).

Mark the correct choice as:

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

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

Q8. Assertion: Legumes increase the soil fertility. **1M**
Reason : Microbes in the root nodules of leguminous plants fix atmospheric nitrogen.

Q9. Assertion: Cattle are fed with roughage and concentrates. **1M**
Reason : Roughage provides fibres while concentrates provide proteins and other nutrients.

Q10.(i) Name the plant tissue which is found in the husk of a coconut. Name the chemical which is responsible for its stiffness. **2M**
 (ii) Give one way in which it differs from parenchymatous cells.

Q11.(i) How is prokaryotic cell different from a eukaryotic cell? **2M**
 (ii) Which organelle is known as the powerhouse of the cell? Why?

Q12.What are the differences between broilers and layers and in their management. **2M**

OR

- (i) Compare the use of manure and fertilisers in maintaining soil fertility.
 (ii) Which method is commonly used for improving cattle breeds and why?

Q13. Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and site/location in the body. **3M**

Q14.(i) What are the advantages of composite fish culture? **3M**
 (ii) Explain any one method of crop production which ensures high yield.
 (iii) What are the advantages of inter-cropping and crop rotation?

Q15. The Golgi apparatus, first described by Camilo Golgi, consists of a system of **4M**
 membrane-bound vesicles (flattened sacs) arranged approximately parallel to each other in stacks called cisterns. These membranes often have connections with the membranes of ER and therefore constitute another portion of a complex cellular membrane system. The material synthesised near the ER is packaged and dispatched to various targets inside and outside the cell through the Golgi apparatus. Its functions include the storage, modification and packaging of products in vesicles. In some cases, complex sugars may be made from simple sugars in the Golgi apparatus. The Golgi apparatus is also involved in the formation of lysosomes.

Attempt either (A) or (B):

- (A): Enlist the function of Golgi apparatus.
 (B): Name the cell organelles which are involved in the formation of lysosomes?
 (C) Who discovered Golgi apparatus?
 (D) A system of membrane-bound flattened sacs arranged approximately parallel to each other in stacks are called as _____.

Q16. Attempt either (A) or (B):

(A):

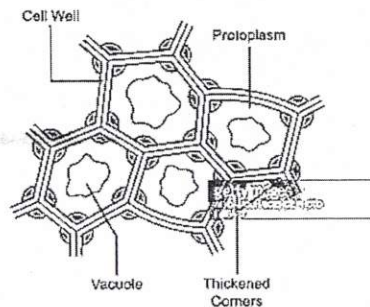
- (i) Give a brief account of the discovery of the cell. **2M**
- (ii) Write down the difference between diffusion and osmosis. **1M**
- (iii) Why plasma membrane is known as selectively permeable membrane. **2M**
Enumerate functions of the plasma membrane.

OR

(B):

- (i) Explain meristematic tissue, its type and function with well labelled diagram. **3M**

(ii)



- (a) Identify the tissue given in the following figure. **2M**
- (b) Mention the characteristic features of the cells.
- (c) Specify the function of this tissue.
- (d) Name any one part of the plant, where these cells are present.

SECTION B

Q17. Which of the following statements is correct? **1M**

- (a) Solids can be compressed easily
- (b) Liquids do not take the shape of the container
- (c) Gases have high density
- (d) Liquids have fixed volume but no fixed shape

Q18. Which of the following changes is reversible? **1M**

- (a) Melting of wax
- (b) Burning of paper
- (c) Rusting of iron
- (d) Cooking of food

Q19. Which of the following is an example of a pure substance? **1M**

- (a) Hydrogen
- (b) Salt solution
- (c) Sand and water
- (d) Air

Q20. What is the main characteristic of a homogeneous mixture? **1M**

- (a) The components settle over time
- (b) The components are visibly different
- (c) The components are uniformly distributed
- (d) The components can be separated by physical means

- Q21.** Which of the following particles are found in the nucleus of an atom? **1M**
(a) Only neutrons (b) Electrons and neutrons
(c) Protons and neutrons (d) Electrons and protons

- Q22.** What does the law of conservation of mass state? **1M**
(a) Mass is gained during a chemical reaction
(b) Mass remains constant during a chemical reaction
(c) Mass can be created in a chemical reaction
(d) Mass is lost during a chemical reaction

- Q23.** Atomicity of Chlorine and Argon is **1M**
(a) Diatomic and Monoatomic (b) Monoatomic and Diatomic
(c) Monoatomic and Monoatomic (d) Diatomic and Diatomic

In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason. Of the statements, mark the correct answer **as**:

- (a) Both assertion and reason are true and reason is the correct explanation of assertion
(b) Both assertion and reason are true but reason is not the correct explanation of assertion
(c) Assertion is true but reason is false
(d) Assertion is false but reason is true

- Q24. Assertion:** Number of electrons are not equal to the number of proton in neutral atom.
Reason : Same number of proton and electron present in atom makes it stable. **1M**

- Q25.** Name the process associated with the following: **2M**
(i) A drop of ink placed on the water's surface in a glass spreads throughout the water.
(ii) why the temperature of a substance remains constant at its melting point or boiling point?

OR

- (i) Why do we feel comfortable under a fan when we are perspiring?
(ii) Name the state of matter in which:
(a) Layers of particles can slip and slide over one another easily.
(b) Particles just move around randomly because of very weak force of attraction.

- Q26.** (i) The formula of sulphuric acid is H_2SO_4 what information do you get from this formula? **3M**
(ii) Explain the difference between 4P and P_4 .
(iii) Write the chemical formulae of the following.
(a) Magnesium chloride (b) Calcium carbonate

OR

- (i) Carbon dioxide produced by action of dilute hydrochloric acid on potassium hydrogen carbonate is moist whereas that produced by heating potassium hydrogen carbonate is dry. What would be the difference in the composition of carbon dioxide in the two cases? State the associated law.
(ii) Define the atomic mass unit.
(iii) Calculate the molecular mass of the following substances.
(a) $\text{C}_2\text{H}_5\text{OH}$ (b) MgSO_4

Q27. During an experiment the students were asked to prepare a 10% (Mass/Mass) solution of sugar in water. Ramesh dissolved 10g of sugar in 100g of water while Disha prepared it by dissolving 10g of sugar in water to make 100g of the solution. **3M**

- (i) Are the two solutions of the same concentration?
- (ii) Compare the mass % of the two solutions.

OR

- (i) Name a lustrous non-metal.
- (ii) Name a non-metal which exists as a liquid at room temperature.
- (iii) Name a metal which exists as a liquid at room temperature.
- (iv) Name a non-metal which is known to form the largest number of compounds.
- (v) Name a non-metal is good conductor of electricity.
- (vi) Name a non-metal which is compulsory for combustion.

Q28. Read the following passage and answer the questions given below. **4M**

In a chemistry lab, students are observing dry ice (solid carbon dioxide). One student notices that it directly changes into a gaseous state without becoming liquid. The teacher explains this process and compares it with camphor burning, which also seems to disappear without leaving any liquid behind. This led to a discussion on conditions under which substances change their state.

- (i) What is the name of the process by which dry ice changes directly into a gas?
- (ii) Name two more substance that undergoes the same type of change.
(Other than dry ice & camphor)
- (iii) What condition of pressure and temperature is usually required for sublimation?
- (iv) How can knowledge of sublimation be applied in daily life or industries?.

OR

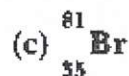
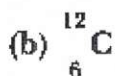
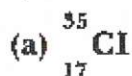
- (iv) Name the term used to denote the conversion of vapour to solid.

Q29. (i) On the basis of Thomson's model of an atom, explain how the atom is neutral as a whole. **5M**

- (ii) Mg^{2+} has completely filled K and L shells. Explain.
- (iii) Draw a sketch of Bohr's model of an atom with three shells.
- (iv) 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?

OR

- (i) If bromine atom is available in the form of say, two isotopes $^{79}_{35}\text{Br}$ (49.7%) and $^{81}_{35}\text{Br}$ (50.3%), calculate the average atomic mass of bromine atom.
- (ii) Complete the table on the basis of information available in the symbols given below.



Element	n_p	n_n

SECTION C

Q30. The speedometer reading of a car at different times is given below:

1M

Time	Speedometer reading
9:25 am	36 kmh ⁻¹
9:45 am	72 kmh ⁻¹

Calculate acceleration of the car?

(a) 1.8ms^{-2}

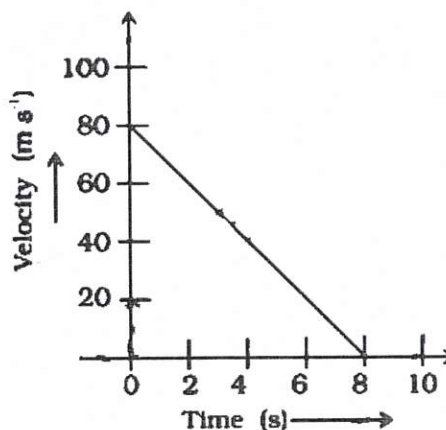
(b) $\frac{1}{420}\text{ms}^{-2}$

(c) $\frac{1}{120}\text{ms}^{-2}$

(d) 4.8ms^{-2}

Q31. Velocity versus time graph of a ball of mass 50 g rolling on a concrete floor is shown below. Calculate the frictional force of the floor on the ball

1M



(a) 0.25N

(b) 0.5 N

(c) 2N

(d) 2.5 N

Q32. In each of the following questions, a statement of Assertion is given followed by a corresponding statement of Reason. Of the statements, mark the correct answer as:

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

Assertion: Energy can be converted from one form to another.

1M

Reason : According to the law of conservation of energy, total energy remains constant in any process.

Q33. Attempt either (A) or (B):

2M

(A):

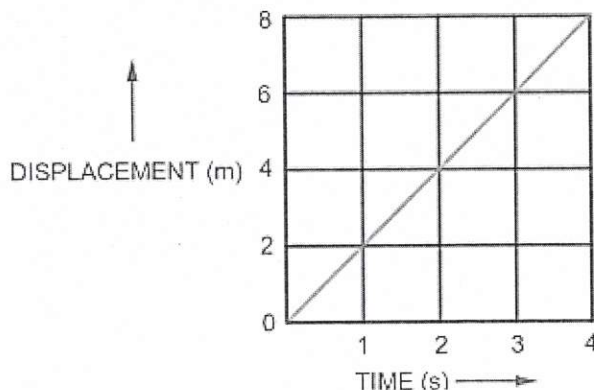
- (i) A force between two bodies of mass m_1 and m_2 separated by distance “d” is 10 N . Find new force between them if both masses are doubled and distance between them is tripled.
- (ii) If weight of an object on the moon is 175N then find its mass and weight on the earth.

OR

(B):

- (i) Write two differences between acceleration due gravity (g) and universal gravitation constant (G).
- (ii) State Newton's law of gravitation.

Q34. Figure below shows the displacement-time graph for the motion of a body. Use it to calculate the velocity of body at $t = 1$ s, 2 s and 3 s, then draw the velocity-time graph for it in the answer sheet. (Graph paper is not required for this question) **2M**



- Q35.** (i) A solid object in shape of cube of edge 20 cm of mass 50 g is immersed in a liquid of density 1.5 g/cm^3 . Suggest will it float or sink in it. ($g = 10 \text{ ms}^{-2}$) **3M**
- (ii) A body of density 5 g/cm^3 weighs 0.5 kgf in air. It is immersed in water of density 1 g/cm^3 . Calculate the apparent weight of solid in water. ($g = 10 \text{ ms}^{-2}$)

OR

- (i) A solid of density 5000 kg m^{-3} weighs 0.5 kgf in air. It is completely immersed in water of density 1000 kg m^{-3} . Calculate the apparent weight of the solid in water. (Take $g = 10 \text{ ms}^{-2}$).
- (ii) Write all factors on which buoyancy depends.

- Q36.** (i) When a train suddenly moves forward, the passenger standing in the compartment ends to fall backwards. Give reason.
- (ii) Why does a glass vessel break when it falls on a hard floor, but it does not break when it falls on a carpet?
- (iii) "Firing a bullet from a gun". Name and state the action and reaction. **3M**

OR

- (i) The linear momentum of a ball of mass 50 g is 0.5 kg m s^{-1} . Find its velocity.
- (ii) A force of 19600 dyne acts on a body of mass 4.9 kg. Find the acceleration produced (in ms^{-2}).

- Q37.** A train is moving with a velocity of 90 km h^{-1} . It is brought to stop by applying the brakes which produce a retardation of 0.5 m s^{-2} . Find :
- (i) the velocity after 10 s, and
 - (ii) the time taken by the train to come to rest. **3M**

- Q38.** Energy exists in many different forms. The change of one form of energy into another form of energy is known as transformation of energy. When a body is released from a height, then the potential energy of the body is gradually transformed (or changed) into

kinetic energy. When a body is thrown upwards, the kinetic energy of body is gradually transformed into potential energy.

In our everyday life, we make use of many appliances (or machines) which convert one form of energy into another form. Some examples of the energy converters which make our life more comfortable are: electric motor, electric generator, electric iron, electric bulb and solar cell.

When energy changes from one form to another, there is no loss or gain of energy. The total energy before and after transformation remains the same, i.e. energy can neither be created nor be destroyed.

Choose the appropriate option.

4M

(i) In case of riding a bicycle,

- (a) the muscular energy is converted into the kinetic energy of the bicycle
- (b) the kinetic energy is converted into the muscular energy
- (c) the potential energy is converted into mechanical energy
- (d) None of the above

(ii) The potential energy of a freely falling object decreases progressively, then

- (a) total mechanical energy will decrease
- (b) total mechanical energy will increase
- (c) total mechanical energy will remain constant
- (d) None of the above

(iii) The velocity of a body of mass 100 g having a kinetic energy of 20 J is

- (a) 10 ms^{-1}
- (b) 15 ms^{-1}
- (c) 20 ms^{-1}
- (d) 25 ms^{-1}

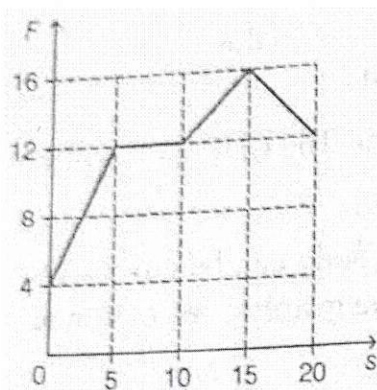
Attempt either (iv) or (v):

(iv) The work done in lifting 200kg of a mass through a vertical distance of 6m is

- (a) 10000 J
- (b) 12000 J
- (c) 15000 J
- (d) 19000 J

OR

(v) The following figure shows the frictional force versus displacement for a particle in motion. The loss of kinetic energy (work done against friction) in travelling over $s = 0$ to $s = 20\text{m}$ will be



- (a) 80J
- (b) 160J
- (c) 240J
- (d) 24J

Q39. Attempt either (A) or (B):

(A):

- (i) Write two differences between infrasonic and ultrasonic waves.
- (ii) State one medicinal use and one industrial use of ultrasound waves.
- (iii) Why are the ceilings of concert halls curved?

5M

OR

(B):

- (i) Sound wave travels at a speed of 339 m s^{-1} . If its wavelength is 1.5 cm, what is the frequency of the wave? Will it be audible?
- (ii) A submarine emits a sonar pulse, which returns from an underwater cliff in 1.02 s. If the speed of sound in salt water is 1531 m/s, how far away is the cliff?
- (ii) Write the conditions of echo?
