

Directorate of Education, GNCT of Delhi
Mid Term Examination Practice Paper (Session: 2026-27)
Class:IX; Subject: SCIENCE (086)

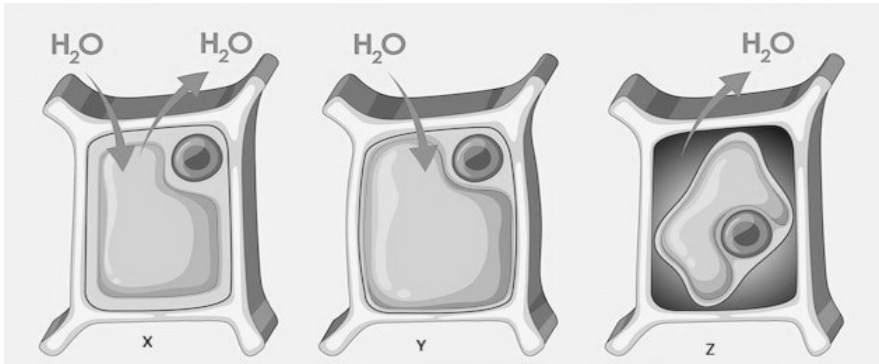
Maximum Marks: 80

Duration: 3 hours

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 sections are compulsory. However internal choice is provided in some questions. A student is expected to attempt only one these questions.**

Section A		
Q.No.	Question	Marks
1.	Which of the following pairs of cell organelles contains DNA? A.Chloroplasts, Ribosomes B.Mitochondria, Nucleus C.Golgi bodies, Ribosomes D.Nucleus, Lysosomes	1
2.	Identify the pair that is incorrectly matched with respect to the function of the cell organelle: A. Ribosome — Protein synthesis B. SER — Cellulose synthesis C. Lysosome — Digestion of foreign agents D. Mitochondria — Release of energy in the form of ATP	1
3.	Which meristematic tissue is responsible for increase in girth of a stem? A. Apical meristem B. Lateral meristem C. Intercalary meristem D. Parenchyma	1
4.	Axons carry nerve impulses: A. Toward the cell body B. Away from the cell body C. In both directions D. Only in sensory neurons	1
5.	Which tissue directly connects a muscle to a bone? A. Ligament B. Cartilage C. Tendon D. Bone	1
6.	The greenhouse effect: A. Cools earth by reflecting sunlight B. Traps outgoing infrared radiation and keeps earth warm C. Has no effect on temperature D. Causes only ozone depletion	1
7.	Which gas absorbs harmful ultraviolet (UV) radiation in the stratosphere?	1

	A. Oxygen B. Carbon dioxide C. Ozone D. Nitrogen	
The following two questions no.8,9 consists of two statements- Assertion (A) and Reason (R). Answer these questions by selecting 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.		
8.	Assertion (A):Cutting the root tip of an onion plant stops further elongation of that root. Reason (R): The apical meristem, located at the root tip, contains actively dividing cells responsible for root elongation.	1
9.	Assertion (A):Burning fossil fuels rapidly disrupts the carbon cycle. Reason (R):Fossil fuels release carbon stored over millions of years back to the atmosphere over a few decades.	1
10.	How much solar energy will be received by a 1 m ² area in one hour, if the insolation on the surface of the earth were 1 kWm ⁻² ?	2
11.	<u>Attempt either (A) or (B).</u> A. Mention the type of tissue present in: (i). Husk of coconut shell (ii). Aquatic plants to help them float (iii).Bark of tree trunk OR B. Identify the type of joints in the human body: (i). Shoulder---Arms (ii).Elbow (upper arm to fore arm) (iii).Side to Side movement of neck.	3
12.	The diagram below shows three states of a plant cell after being placed in different solutions. Match each state (X,Y,Z) to the correct solution type (isotonic, hypotonic, hypertonic). Define plasmolysis.  <u>Only for visually impaired students .</u> Answer the following: (i). Name the cell organelle responsible for protein synthesis. (ii). Why are lysosomes called the ‘Suicide bags’ of the cell? (iii). What is the function of the cell membrane?	3

13.	Indicate the presence or absence of following structures in Bacterial cell and Animal cell: <table border="1" data-bbox="339 264 1249 421"> <thead> <tr> <th>Structures in cell</th><th>Bacterial cell</th><th>Animal cell</th></tr> </thead> <tbody> <tr> <td>Chromosome</td><td></td><td></td></tr> <tr> <td>Nucleus</td><td></td><td></td></tr> <tr> <td>Mitochondria</td><td></td><td></td></tr> </tbody> </table>	Structures in cell	Bacterial cell	Animal cell	Chromosome			Nucleus			Mitochondria			3
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Mitochondria														
14.	The diagram below shows a motor neuron with four labelled structures: A,B,C,D. Name each labelled structure and state its specific role in nerve signal transmission. <u>Only for visually impaired students .</u> Answer the following questions: a) Name the tissue responsible for the growth in length of a plant. b) Name the tissue that connects bones to other bones in the human body. c) What is the main function of xylem tissue in plants?	3												
15.	During a biology practical, a student observed different types of animal tissues under a microscope. The teacher explained that epithelial tissue covers the external and internal surfaces of the body and protects the underlying parts. The student also observed a tissue made up of elongated cells that contracts and helps in the movement of different body parts. Another tissue was found connecting muscles to bones and was described as a strong connective tissue. - Which type of tissue forms the lining of alveoli in the lungs? - Name the tissue responsible for the movement of the body by contraction. <u>Attempt either (c) or (d).</u> - Differentiate between a tendon and a ligament on the basis of their function and flexibility. OR - Write any two differences between striated muscle and smooth muscle.	4												
16.	<u>Attempt either (A) or (B).</u> (i).What is the function of the cell membrane? How does it help the cell maintain its internal environment? (ii). State three postulates of the Cell Theory.	5												

	OR	
	B. Identify the following: (i). A universal selectively permeable membrane that defines the individuality of the cell (ii). Genetic material of prokaryotic cells. (iii). Protein factories of cell. (iv). Organelle that acts as a post office of the cell (v). Type of cell division restricted to cells of reproductive organs.	
Section B		
17.	The tyndall effect is NOT observed in: A. Milk B. Fog C. Common salt solution D. Starch Solution	1
18.	Which separation technique uses the difference in boiling points of two miscible liquids? A. Crystallisation B. Chromatography C. Distillation D. Centrifugation	1
19.	Centrifugation separates components of a mixture based on the difference in: A. Boiling point B. Density and mass difference C. Solubility difference D. Colour difference	1
Question no. 20 consists of two statements- Assertion (A) and Reason (R). Answer this question by selecting 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		
20.	Assertion (A): A true solution does not show the tyndall effect. Reason (R): The particles of a solution are larger than 100 nm in size.	1
21.	Why do suspended particles settle in muddy water over time but not in milk?	2
22.	A medical laboratory separates blood into plasma and cells. Which separation technique is used? Briefly explain the principle.	2
23.	Differentiate between a homogeneous mixture and a heterogeneous mixture. Give one example each.	2
24.	A cake recipe uses 75g sugar, 420g flour, and 5g sodium hydrogen carbonate in a total of 500g. Calculate the % m/m concentration of each component.	3
25.	<u>Attempt either option (A) or (B).</u> A. State one difference each between solutions, suspensions and colloids with example. OR B. (i). What is the principle of distillation? Give one example.	3

	(ii). What is paper chromatography? Give an example (iii). Explain how centrifugation is used for separation the components of a mixture , giving two suitable examples.																					
26.	A teacher shines a laser beam through three beakers: Beaker A (salt solution), Beaker B (chalk powder in water) and Beaker C (milk in water) and asks students to record their observations. The results are shown in table below: <table><tr><td>Beaker</td><td>Contents</td><td>Laser path visible?</td><td>Residue on filter paper?</td><td>Settles on standing?</td></tr><tr><td>A</td><td>Salt+ water</td><td>No</td><td>No</td><td>No</td></tr><tr><td>B</td><td>Chalk+ water</td><td>Yes</td><td>Yes (chalk)</td><td>Yes (slowly)</td></tr><tr><td>C</td><td>Milk+ water</td><td>Yes</td><td>No</td><td>No</td></tr></table> a. Classify beakers A,B and C as a solution, suspension or colloid. b.Why does beaker C show the tyndall effect but cannot be separated by filtration? <u>Attempt either (c) or (d).</u> c. If starch solution replaced milk in beaker C, would the observations change? Explain. OR d.Name the phenomenon responsible for the visible laser path in beakers B and C. Why does this not occur in beaker A?	Beaker	Contents	Laser path visible?	Residue on filter paper?	Settles on standing?	A	Salt+ water	No	No	No	B	Chalk+ water	Yes	Yes (chalk)	Yes (slowly)	C	Milk+ water	Yes	No	No	4
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27.	<u>Attempt either (A) or (B).</u> A. a) Explain the principle of filtration. Describe how filtration is used to separate the components of a mixture. b) State the role of the filter medium in the process of filtration. c) Give one suitable example of separation by filtration. OR B. a) Clouds are made up of tiny water droplets or ice crystals floating in the air. Based on what you know about solutions, suspensions and colloids, what type of mixture do you think clouds are and why? b) Why do cities with a lot of smoke and dust in the air often look hazy? c) Blood is an example of a mixture. In a blood sample, identify the dispersed phase and the dispersion medium.	5																				
Section C																						
28.	A car travels 60 km in 1 hour and 40 km in the next 1 hour. Its average speed is- A. 50 km h⁻¹ B. 60 km h⁻¹ C.40 km h⁻¹ D.100 km h⁻¹	1																				
29.	The area under a velocity- time graph represents A. Acceleration of the object B. Average speed C. Displacement of the object D. Distance from origin	1																				

30.	A ball is dropped from rest. After 3 s ($g = 10\text{ms}^{-2}$), its velocity is A. 10 ms^{-1} B. 20 ms^{-1} C. 30 ms^{-1} D. 45 ms^{-1}	1
31.	A force can change which of the following? A. Speed only B. Direction only C. Shape only D. Speed, direction and shape	1
32.	Newton's first law is also known as: A. Law of Acceleration B. Law of Inertia C. Law of Action- Reaction D. Law of Gravity	1
33.	If the mass of an object is doubled and the net force is kept same, the acceleration: A. Doubles B. Stays the same C. Is halved D. Becomes zero	1
Question no.34 consists of two statements- Assertion (A) and Reason (R). Answer this question by selecting 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		
34.	Assertion (A): The slope of a position- time graph gives the velocity of the object. Reason (R): The slope of a position- time graph is the ratio of change in position to change in time, which by definition equals the average velocity over that interval.	1
35.	A school bus travels 4 km due east, then 3 km due north, completing its route in 30 minutes. Calculate: i) the total distance travelled and ii) the magnitude of the displacement.	2
36.	<u>Attempt either (A) or (B).</u> A. A sailor jumps out from a small boat to the shore. As the sailor jumps forward, will the boat move? If yes, in which direction and why? Name the Newton's law that explains this. OR B. A toy car of mass 100 g is moving with a constant velocity of 0.5 ms^{-1} . What is the net force acting on the toy car? State the Newton's law that supports your answer.	2

37.	A 5 kg block rests on a horizontal surface. The maximum static friction between the block and the surface is 15 N. A horizontal force of 20 N is applied. Assume that the frictional force acting on the block during motion is 15 N. a) Calculate the net force. b) Find the acceleration. c) What happens if the applied force is exactly 15 N?	3
38.	Two friends, Rohan and Ritesh of class IX were sitting in the school corridor and tried to push a pillar with all their might. Rohan explains the situation that the pillar did not move because of its inertia while Ritesh says that it is because action and reaction forces cancel each other's effect. a. Which of the two friends gave correct justification? b. State the law of Newton that explains the above situation. <u>Attempt either (c) or (d).</u> c. A passenger in a moving bus tends to fall forward when the driver suddenly applies the brakes. Explain why this happens. OR d. When a person jumps from a boat onto the shore, the boat moves backwards. Explain why.	4
39.	<u>Attempt either (A) or (B).</u> A. A motorist on a national highway covers the first 150 km at 75 kmh^{-1} and the next 150 km at 50 kmh^{-1}. i). Find the time taken for each half of the journey. ii). Calculate the average speed for the entire 300 km journey. iii). Calculate the average velocity if the motorist drives in a straight-line direction. iv). Explain using the formula for average speed why the result in (ii) is closer to 50 kmh^{-1} than to 75 kmh^{-1}. OR B. A train departs from station A and reaches station B 300 km away. The first 100 km is covered with acceleration a_1 from rest, reaching a maximum speed of 40 ms^{-1}; the next 200 km is covered at a constant speed of 40 ms^{-1}. i). Determine the time taken for the first 100 km. ii). Calculate a_1. iii). Find the average speed for the entire journey.	5