Sample Paper_271125
Pre-Midterm Examination

Class: IX | Subject: SCIENCE (086) Set- II | Max. marks: 30 Time: 1 Hour

General Instructions:
Read the following instructions carefully.
(i) This question paper consists of 14 questions in 3 sections. Section A is Biology, Section B is Chemistry, and Section C is Physics.
(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.

<table>
<tr><th>Q. No.</th><th>Questions</th><th>Marks</th></tr>
<tr><td></td><td>Section – A</td><td></td></tr>
<tr><td>1</td><td>A student observes two onion peel slides under a light microscope and records the following data:

<table><tr><th>Slide</th><th>Diameter of visible field (µm)</th><th>Number of cells along the diameter</th></tr><tr><td>A</td><td>2000</td><td>10</td></tr><tr><td>B</td><td>1500</td><td>5</td></tr></table>Based on the above data, which of the following statements is correct?
A. Cells in Slide A are larger than those in Slide B
B. Cells in Slide B are larger than those in Slide A
C. Cells in both slides are of equal size
D. Cells in Slide A are half the size of those in Slide B</td><td>1</td></tr>
<tr><td>2</td><td>The following question consists of two statements – Assertion (A) and Reason (R). Answer the question 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.
Assertion (A): A light microscope with an eyepiece 10X and objective lens 10X produces a total magnification of 100X.
Reason (R): The total magnification of a microscope is obtained by multiplying the magnifying power of the eyepiece and the objective lens.</td><td>1</td></tr>
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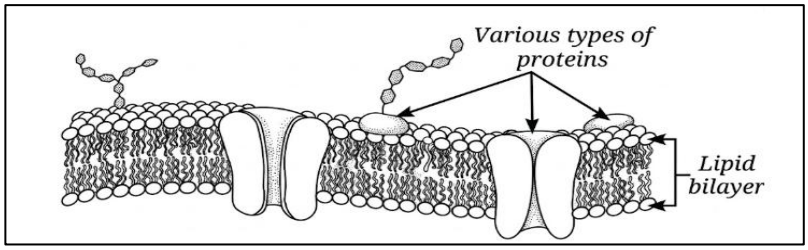
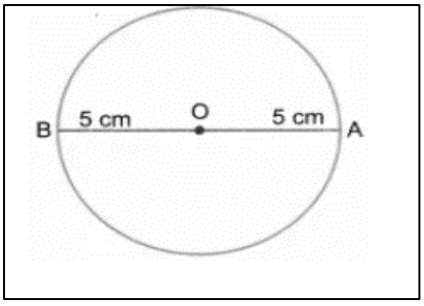
3	**<u>Students to attempt either option A or B.</u>** A. A plant cell is placed in three different solutions: isotonic, hypotonic, and hypertonic. The movement of water depends on the concentration of solutes inside and outside the cell. (i) What happens to a plant cell when it is placed in a hypertonic solution? (ii) In which type of solution (isotonic, hypotonic, or hypertonic) does a cell show no net movement of water across its cell membrane? Also, give a reason for your answer. **OR** B. Observe the given diagram of the plasma membrane and answer the following questions:  (i) Mention the role of proteins present in the plasma membrane. (ii) What is the nature of the outer heads and inner tails in the lipid bilayer of the plasma membrane?	2
4	(i) Draw a neat diagram showing the general structure of a cell and label the following parts clearly: (a) Cytoplasm (b) Nucleus (ii) State any two postulates of the cell theory.	3
5	Recent studies suggest that life may have originated in water bodies under changing environmental conditions. Hot springs like those in Puga Valley (Ladakh) show very high temperatures similar to early Earth conditions and are inhabited by bacteria called thermophiles. Scientists also found calcium carbonate deposits around these hot springs, which may have protected early organic molecules and helped in the formation of the first protective boundary of life. In living organisms today, some organisms consist of a single cell, while others are made up of many cells working together, where cells coordinate to perform different functions. A. What are thermophiles? B. How do unicellular organisms differ from multicellular organisms in terms of the number of cells? C. What is the role of calcium carbonate deposits found around hot springs in the origin of life?	3

	Section – B	
6	Which of the following properties is NOT a characteristic of colloidal particles? A. Particles from their solution can be separated by filtration. B. Particles of a colloid are too small to be seen individually by the naked eye. C. Particles do not settle down when left undisturbed. D. Particles scatter the beam of visible light.	1
7	The following question consists of two statements – **Assertion (A)** and **Reason (R)**. Answer the question 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.** **Assertion (A):** Sugar solution is a heterogeneous mixture. **Reason (R):** Sugar dissolves completely in water.	1
8	Write any 2 differences between solution and suspension.	2
9	**<u>Attempt either option A or B.</u>** A. (i) What is meant by the concentration of a solution? (ii) Calculate the mass of water required to dissolve 100 g of glucose to create a 40% *m/m* glucose solution. **OR** B. (i) A solution is always a liquid. Comment. (ii) Find out the solute and solvent in the given solutions. (a) Soda water (b) Copper sulphate solution	3
10	While preparing food at home, Riya mixes flour with water to make batter and adds a few drops of milk to the water in another container. After some time, she observes that the flour particles settle at the bottom, whereas the milk does not. A. Based on the above observations, identify which type of mixture each one belongs to: solution, suspension or colloid. B. Which one of the above mixtures, flour in water and milk in water, is heterogeneous? Give reasons. C. Choose pure substances from the following. Copper, Air, Blood, Water, Soil	3
	Section – C	
11	Which of the following is a scalar quantity? A. Displacement B. Velocity C. Distance D. Acceleration	1

12	The following question consists of two statements – **Assertion (A)** and **Reason (R)**. Answer the question 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.** **Assertion (A):** Displacement is the shortest distance from one point to another. **Reason (R):** Displacement can never be greater than the distance travelled.	1
13	Arjun's school organised a swimming competition in a 50 m pool. Arjun completed one full length of the pool (50 m) and immediately swam back to the starting wall, finishing the round trip in 100 seconds. A. What is the average speed of Arjun during the 100 s time interval? B. What is the average velocity of Arjun during the same 100 s time interval? C. Under what condition(s) is the magnitude of the average velocity of an object equal to its average speed?	3
14	**<u>Attempt either option A or B.</u>** A. (i) What is the difference between distance and displacement? (2 points) (ii) A particle moves in a circle with O as centre and AO = OB = 5cm, as radius, as shown in the given figure. It starts from A.  Calculate: (a) The distance covered, and (b) The displacement, when it reaches B. **OR** B. (i) Define acceleration. (ii) What is the difference between speed and velocity? (2 points) (iii) A cyclist once goes round a circular track of diameter 105 m in 5 minutes. Calculate his speed.	5

All the Best