विद्या सर्वार्थि साधिका

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PERIODIC TEST - 2

Class: IX

Subject: Science (086) MM : 80

Date : 12-09-2025 Time: 3 hours

General Instructions:

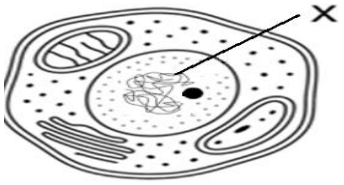
1. This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

SECTION A

1. Alex conducts an experiment with a de-shelled egg by placing it first in pure water and then in a concentrated salt solution. What will be his observation in each case? (1)

	Pure water	Concentrated salt solution
(A)	Egg swells	Egg remains unchanged
(B)	Egg shrinks	Egg swells
(C)	Egg swells	Egg shrinks
(D)	Egg remains unchanged	Egg shrinks

2. The given diagram shows a magnified view of a human cell. Name the part labelled as X. (1)

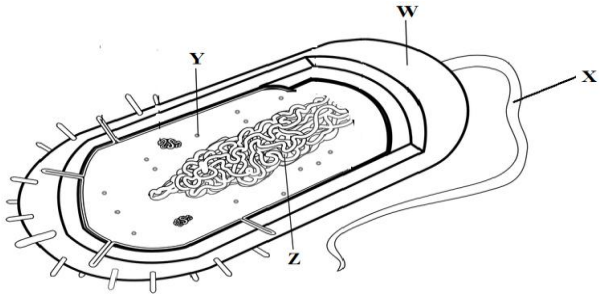


(A) Chromatid
(B) Chromosome
(C) Nucleoplasm
(D) Chromatin

3. The husk of coconut is made up of _____tissue. (1)

(A) collenchyma (B) parenchyma (C) aerenchyma (D) sclerenchyma

4. A prokaryotic cell is shown with parts labelled as W, X, Y, and Z. Identify the correct combination of these labels with their respective structures. (1)



(A) W - Cell wall,	X – Flagella,	Y- Cytoplasm,	Z – Nucleoid.
(B) W - Flagella,	X - Cell wall,	Y- Nucleoid,	Z – Cytoplasm.
(C) W - Nucleoid,	X- Cytoplasm,	Y- Flagella,	Z - Cell wall.
(D) W - Cytoplasm,	X - Nucleoid,	Y- Cell wall,	Z- Flagella.

5. Identify the correct characteristic features of striated muscles from the given options: (1)
(A) Cylindrical, striated and skeletal
(B) Spindle, unbranched and uninucleated
(C) Cylindrical, unstriated and non-nucleated
(D) Cylindrical, striated and branched

6. Plants such as cucumber and sweet peas, have tendrils for their mechanical support and flexibility. Identify the tissue found in the tendrils of such plants. (1)
(A) Parenchyma (B) Collenchyma (C) Epidermis (D) Sclerenchyma

7. How does the presence of cutin in the epidermis of desert plants benefit them? (1)
(A) Increases photosynthesis (B) Aids in gas exchange
(C) Facilitates nutrient absorption (D) Prevents water loss

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.

8. A: Mitosis is a means of multiplication in unicellular organisms. (1)
R: Mitosis in multicellular organisms brings about growth and repair.

9. A: Neurons are specialised cells for the conduction of nerve impulses. (1)
R: Nissl's granules are present in the cyton of each neuron.

10. What are the complex permanent tissues in vascular plants? Name the phloem components. (2)

11. <u>Attempt either option A or B.</u> (2)
A. Name the organelles that show the analogy written as under:
(i) Transporting channels of the cell
(ii) Packaging and dispatching unit of the cell
(iii) Storage sacs of the cell
(iv) Controlling centre of the cell.

OR

B. Write the name of the scientist/ instrument for the following:
(i) The scientist who first observed cells in a cork slice?
(ii) The two biologists who proposed the cell theory.
(iii) The scientist who suggested that all cells arise from pre-existing cells.
(iv) The instrument whose discovery in 1940 helped in detailed study of cell organelles.

12. (a) Describe the structure and function of the endoplasmic reticulum. (3)
(b) When is the plasma membrane called a selectively permeable membrane?

13. (a) Define the process 'differentiation' that occurs in plant tissues. (3)
(b) Classify any two types of parenchyma tissues with suitable examples.

14. Cells are the basic structural and functional units of life. In plants, a cell wall surrounds the plasma membrane, giving rigidity and shape. Vacuoles in plant cells are generally large and help in storing water, pigments, and waste materials. In animals, vacuoles are either small or absent. The nucleus in both plant and animal cells controls cellular activities and contains hereditary material.
(a) If the plasma membrane of a cell breaks down, what will be the immediate effect on the cell? (1)
(b) Name two organelles, other than the nucleus, that also contain DNA. (1)
(c) Explain how the absence of a nucleus would affect a cell. (2)

OR

(c) Vacuoles are large in plants but very small in animals. How does this structural difference help to plants?

15. Attempt either option A or B. (5)

A. (i) Draw a neat diagram of a neuron and label the following parts:
   a) Short, branched parts of the neuron that receive messages from other neurons.
   b) The ends of the axon that pass nerve impulses to the next neuron.
   c) Small gaps in the myelin sheath that help in faster transmission of impulses.
   d) A long fibre that carries nerve impulses away from the cell body.

   (ii) State the functions of nervous tissue in animals.

OR

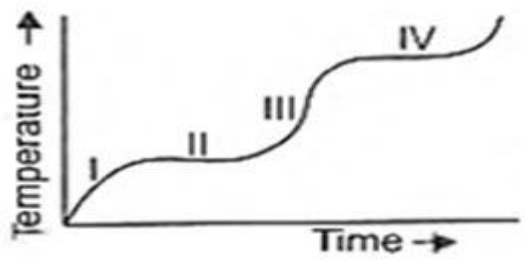
B. (i) Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and location in the body.

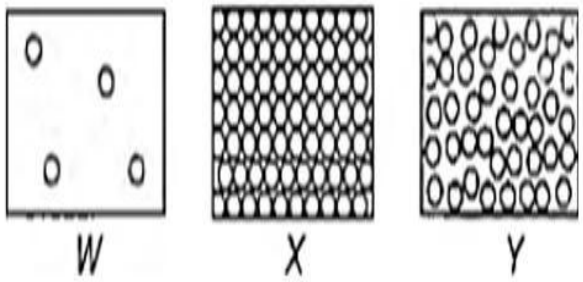
   (ii) What is the specific function of the cardiac muscle?

   (iii) Identify the muscle located in the walls of internal organs such as the intestine, stomach, and blood vessels.

SECTION B

16. The given graph shows the temperature changes which occur on warming the substance. (1)





In which region of the graph would all the particles be packed as in Y?

(A) IV (B) II (C) III (D) I

17. Iodized common salt is _____. (1)

(A) homogeneous mixtures (B) heterogeneous mixtures
(C) pure substance (D) colloidal solution

18. Which of the following represents the correct increasing order of the densities of given substances? (1)

(A) Air < Exhaust from chimneys < Cotton < Honey < Iron
(B) Cotton < Air < Exhaust from chimneys < Iron < Honey
(C) Air < Cotton < Exhaust from chimneys < Iron < Honey
(D) Cotton < Exhaust from chimneys < Honey < Iron < Air

19. A student mixed a small amount of iron filings and sulphur powder in a dish. He could not separate the components of this mixture by simple hand picking. Which liquid will help you to separate the components of this mixture? (1)

(A) Carbon disulphide (B) Cold water (C) Boiling water (D) Kerosene

20. Read the following statements. (1)

I. A solution in which size of the solute particles is about 10^{-10} m, is called true solution.
II. A solution which contains maximum possible amount of solute at any given temperature is called its solubility.
III. In suspension, the size of particles is of the order of 10^{-7} m or larger.
IV. A colloid is a heterogeneous system.

Select the correct statements.

(A) I, III and IV only (B) I and II only (C) III and IV only (D) I, II, III and IV

21. A: We find water droplets on the outer surface of a glass containing ice-cold water kept open in air. (1)
R: The moisture present in atmosphere evaporates to give water droplets.
(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.

22. Write any two points of differences between evaporation and boiling. (2)

23. (a) Alloy cannot be separated into their components by physical method but still it is considered as a mixture. Why? (2)
(b) What are the components of Brass?

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

A. (a) Give two points of differences between an element and a compound.
(b) A candle seems to lose its weight on burning. Explain this fact.
(c) "Is a solution always in the liquid state? Comment."

OR

B. (a) Classify each of the following as a physical or a chemical change. Also give reasons.
(i) Rising of hot air over a radiator. (ii) Burning of kerosene in a lantern.
(b) Define: Tyndall effect

25. (a) A gas exerts pressure on the walls of the container. Give reason. (3)
(b) What happens to the molecular motion of 1 kg of water at 273 K when it is changed into ice at same temperature?
(c) Why Kelvin scale of temperature is regarded as better than Celsius scale?

26. Colloids are not just abstract scientific concepts but practical systems that influence daily life. From enhancing the taste and texture of our food, improving the effectiveness of medicines, to keeping our environment clean, colloids play an indispensable role. Their applications show how fundamental chemistry directly impacts human health, comfort, and survival.

- Milk's colloidal nature makes it a nutritious, easily digestible liquid providing proteins, fats, and vitamins.
- Whipped cream is a foam colloid, with air dispersed in fat.
- Colloidal drug carriers enhance absorption and effectiveness of medicines by increasing surface area.
- Colloidal silver prevents infections in wounds.
- Artificial plasma colloids are life-saving in emergency transfusions.

Answer the following questions.

(i) Name a special technique which is used to separate the components of a colloidal mixture? (1)

(ii) Mention the dispersed phase and dispersing medium in pumice stone? (1)

(iii) (a) Even though smoke and fog both are aerosols, why is fog considered safe, but smoke is harmful to human health? (2)

OR

(iii) (b) Why are colloidal solutions considered as heterogeneous mixture? Explain.

27. Attempt either option A or B. (5)

A. Write an activity to prove that the rate of evaporation increases with increase in temperature.

OR

B. Write an activity to prove that the rate of diffusion increases with increase in temperature.

SECTION C

28. In uniform motion, the slope of the velocity-time graph is _____. (1)

(A) positive (B) negative (C) zero (D) both Positive and negative

29. Which of the following is true for displacement? (1)

(A) It is always equal to distance travelled.
(B) It is greater than distance travelled in a specific direction
(C) It is the direction of motion from one point to another.
(D) It is the length of the path covered by an object.

30. The force of attraction between two-unit point masses separated by a unit distance is equal to _____. (1)

(A) gravitational field (B) gravitational potential
(C) universal gravitational constant (D) acceleration due to gravity

31. A body of mass 2 kg is moving with a uniform velocity of 5 m/s. What do you infer about momentum and change in momentum of the body? (1)

(A) Momentum and change in momentum are non-zero constant.
(B) Momentum is constant and change in momentum is zero
(C) Momentum and change in momentum are zero
(D) Momentum is zero and change in momentum is constant

32. A: Newton's law of gravitation holds good for any two bodies everywhere in the universe. (1)

R: The universal constant of gravitation G is independent of the medium.

(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.

33. The gravitational force on the surface of the moon is only $\frac{1}{6}^{th}$ of gravitational force on the earth. What is the weight in newton of a 10 kg object on the moon and the earth? (Take g = 10 m/s^2) (2)

34. Attempt either option A or B. (2)

A. Establish the relation between acceleration due to gravity (g) and universal gravitational constant (G).

OR

B. A uniform circular motion is an accelerated motion. Explain.

35. (a) Define momentum of a body. Write its SI unit. (3)

(b) When a tennis ball of mass 60 g hits a wall with a velocity of 100 m/s and bounces back with the same speed, what is the change in momentum of the ball?

36. (a) Write the equations of motion for an object under free fall. (3)

(b) It is common observation that rain clouds can be at about a kilometre altitude above the ground. If a raindrop falls from such a height freely under gravity, what will be its speed? (Take g = 10 m/s^2)

37. Discuss the types of inertia by giving one example in each case. (3)

38. Read the given passage carefully and answer the questions that follow:

Akhtar, Kiran, and Rahul were riding in a motorcar that was moving with a high velocity on an expressway when an insect hit the windshield and got stuck on the windscreen. Akhtar and Kiran started pondering over the situation. Kiran suggested that the insect suffered a greater change in momentum as compared to the change in momentum of the motorcar (because the change in the velocity of the insect was much more than that of the motorcar). Akhtar said that since the motorcar was moving with a larger velocity, it exerted a larger force on the insect. And as a result, the insect died. Rahul while putting an entirely new explanation said that both the motorcar and the insect experienced the same force and a change in their momentum.

(i) State Newton's third law of motion. (1)

(ii) What is the SI unit of rate of change of momentum? (1)

(iii) Akhtar, Kiran, and Rahul gave their scientific explanation for the situation. Out of three, whose explanation was correct and why? (2)

OR

(iii) Why are road accidents at high speeds very much worse than accidents at low speeds?

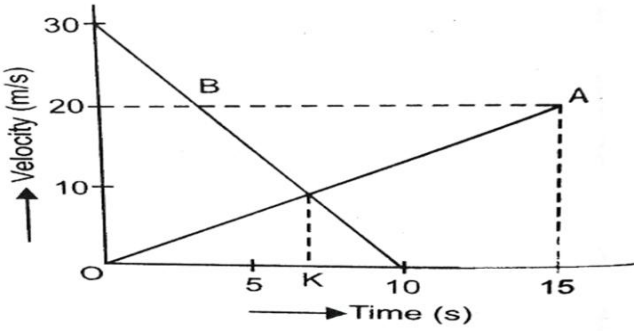
39. Attempt either option (A) or (B). (5)

(A) Using the following data, draw displacement-time graph for a moving object in your answer paper:

Time (s)	0	2	4	6	8	10	12	14	16
Displacement (m)	0	2	4	4	4	6	4	2	0

Use this graph to find the average velocity for the first 4 s, for the next 4 s and for the last 6 s.

OR



(B) The velocity-time graphs of two bodies A and B are shown in the figure. Observe the graphs carefully and answer the following questions:

1. Name the types of motion shown by A and B.
2. Find the slopes of the graphs A and B.
3. Calculate the distance travelled by B before it comes to rest.
4. At what time will the two bodies have equal velocities?