Class - IX
PA - II
(2025-26)
Science

Arnav
IX - A

Date : 17 September 2025
Time: 3 hrs.

Roll No.: 2
M.M : 80

**General Instructions:**

- This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
- 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. Tendons and ligaments are examples of _____. (1)
   a) dense connective tissue
   b) fluid connective tissue
   c) muscular tissue
   d) cartilagenous connective tissue.

2. Engulfing food material or foreign bodies by amoeba is called _____. (1)
   a) plasmolysis
   b) diffusion
   c) osmosis
   d) endocytosis

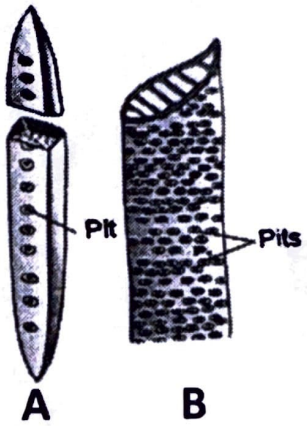
3. Swelling of dry raisins indicates that _____. (1)
   a) external solution is hypertonic
   b) external solution is isotonic
   c) external solution is hypotonic
   d) skin of resins is impermeable

4. Animal cells do not show plasmolysis because _____. (1)
   a) they do not exhibit osmosis

b) they do not possess cell wall
c) they are living cells
d) they have intercellular spaces

5. Ligament connects _____. (1)
a) bone to muscles b) bone to bone
c) organ to bone d) blood vessels to adipose tissue

6. Cells A and B in the following image are the components of _____. (1)




a) phloem b) vacuole
c) xylem d) epidermis

7. Muscles of heart are _____. (1)
a) striated and voluntary
b) nonstriated and voluntary
c) nonstriated and involuntary
d) faintly striated, branched and involuntary

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, but 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): A cell is the fundamental structural and functional unit of all living organisms.
Reason (R): Anything less than a complete structure of a cell does not ensure independent living. (1)

9. Assertion (A): The movement of iris of eye is not under our will.
Reason (R): It has voluntary muscle. (1)

10. Name the type of epithelial tissue found in the following: (2)
a) Respiratory tract b) Kidney tubules
c) Inner lining of small intestine d) Blood vessels

11. What would happen if : (2)
a) skeletal muscles become involuntary?
b) aerenchyma is absent in aquatic plant?

12. Give reason for the following: (2)
a) Plastids are called as semi autonomous organelle.
b) Blood is called as fluid connective tissue.

13. Differentiate between the following: (3)
a) Bone and Cartilage
b) Red blood cell and White blood cell
c) Cell membrane and Cell wall

14. Write characteristic features of different types of simple permanent tissue found in plants. (3)

15. Read the paragraph and answer the following questions.
A group of students completed the project of finding the botanical names for all the trees present in the school

campus. They prepared the metal plates with the names of the trees carved on it. One of the group members, Shreya, was concerned that if the metal plate is fixed on the tree, many cells of the tree may get damaged. Her friend explained that the outer layer of the tree does not have living cells and there won't be any damage to the tree.

a) Name the protective tissue found in the outer layer of the trees. (1)

b) How does this tissue act as protective tissue? (1)

c) Elaborate the role of epidermis as protective tissue. (2)

OR

c) Mention the functions of stomata. (2)

16. a) Draw a well labelled diagram of a prokaryotic cell. (2)

b) Compare the features of plant and animal cell. (3)

## Section – B

17. In which of the following conditions, the distance between the molecules of hydrogen gas would increase? (1)

i) Increasing pressure on hydrogen contained in a closed container

ii) Some hydrogen gas leaking out of the container

iii) Increasing the volume of the container of hydrogen gas

iv) Adding more hydrogen gas to the container without increasing the volume of the container

a) (i) and (iii) b) (i) and (iv)

c) (ii) and (iii) d) (ii) and (iv)

18. The phenomenas that would increase with rise in temperature are _____ . (1)

a) diffusion, evaporation, compression of gases

b) evaporation, compression of gases, solubility

c) evaporation, diffusion, expansion of gases
d) evaporation, solubility, diffusion, compression of gases

19. The subatomic particle responsible for the chemical properties of an element is _____ . (1)
a) proton b) neutron
c) electron d) positron

20. A mixture can be classified as solution, colloids and suspension. Which of the following methods will not allow you to distinguish between a solution? (1)
a) allow the mixture to stand for a period of time
b) shine a beam of light through the mixture
c) filter the mixture
d) do not heat the mixture strongly

21. The particle size in a colloid is _____ . (1)
a) larger than 100 nm
b) less than 1 nm
c) between 1 nm and 100 nm
d) does not affect the state of the colloid

22. The term used for the scattering of light by colloidal particles is _____ . (1)
a) brownian motion b) tyndall effect
c) chromatography d) filtration

23. Which of the following substances has particles that move the fastest at 28°C? (1)
a) Ice b) Oxygen c) Petrol d) Water

The following question consists 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.

24. Assertion (A): Milk is a colloid.
Reason (R): Colloids are heterogeneous mixtures in which the particle size is intermediate between those in true solutions and suspensions. (1)

25. A teacher shows you two clear liquids in separate beakers. One is a solution of salt in water, and the other is a colloid of milk. Without tasting or smelling, how can you identify which beaker contains the solution and which contains the colloid? Explain in detail. (2)

26. a) What are canal rays? (1)
b) Describe the continuous motion of particles of matter with the help of an activity. (2)

27. While heating ice in a beaker with a thermometer suspended in it, a student recorded the following observations:

| Time (in min.) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 15 | 20 | 25 | 30 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. (in °C) | -3 | -1 | 0 | 0 | 5 | 8 | 12 | 15 | 19 | 22 | 30 | 50 | 73 | 100 | 100 |

Based on the above observations, answer the following questions:
a) State the change(s) observed between 2-3 min. and name the process involved. (1)
b) Between 30-35 min., the temperature remains constant. State the reason for this. Name the heat involved in the process and define it. (2)

28. The substances are classified on the basis of their purity. The ones which include particles of only one type are called 'Pure' substances and the ones which are made up of one or more type of particles are called 'impure' substances. The pure substances can be further classified into two categories, and impure substances (also called Mixtures) can be classified as homogeneous and heterogeneous based on their composition.

On the basis of your reading of the above passage, answer the following questions.

a) 'A mixture shows the properties of its constituents.' Comment on this statement with an example. (1)

b) Name the two types of pure substances and give one example of each. (1)

c) Differentiate homogeneous and heterogeneous mixtures in two points. (2)

OR

c) Differentiate two types of heterogeneous mixtures in two points. (2)

29. a) List any three distinguishing features between the models of an atom proposed by J.J. Thomson and Ernest Rutherford. (3)

b) What are the postulates of Bohr's model of an atom? (2)

## Section - C

30. According to the third law of motion, action and reaction _____. (1)

a) always acts on the same body

b) always act on different bodies in opposite direction

c) have same magnitude and direction

d) act on either body at normal to each other

31. The linear momentum of an object is 250 g cm/s. If the velocity of the object is 5 m/s, then the mass of the object is_____.

a) 0.5 g b) 5 kg
c) 0.5 mg d) 5 mg (1)

The following question consists 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.

32. Assertion (A): The displacement during a round trip is zero. (1)

Reason (R): Initial position and final position are the same point during the round trip.

33. The velocity of a body in motion is recorded every second as shown in the table below: (2)

| Time (s) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Velocity (m/s) | 60 | 54 | 48 | 42 | 36 | 30 | 24 | 18 | 12 | 6 | 0 |

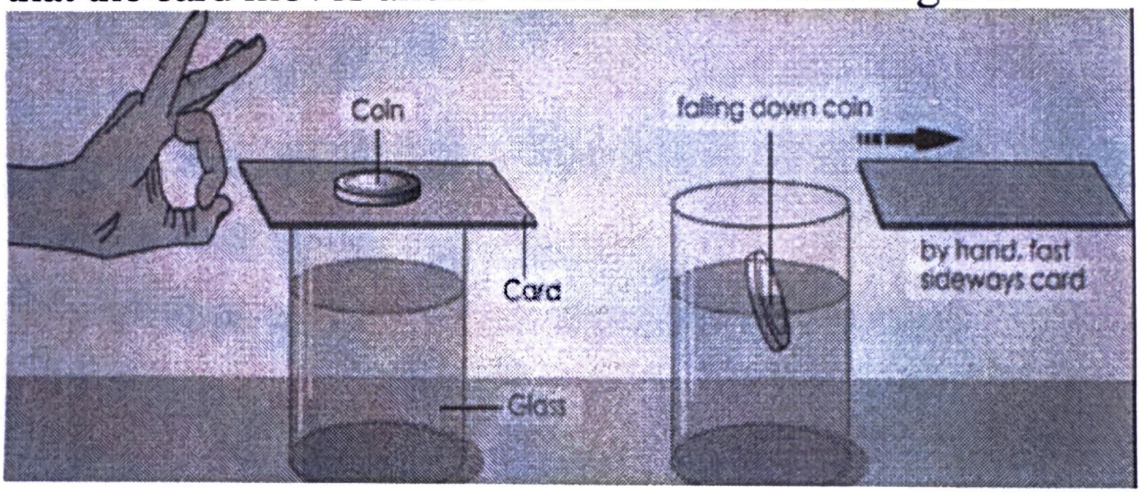
Calculate the acceleration from above data.

34. A motorcycle moving at a speed of 5 m/s is subjected to an acceleration of 0.2 $m/s^2$. Calculate the speed of the motorcycle after 10 seconds, and the distance travelled in this time. (2)

35. a) State universal law of gravitation. (1)
b) Write the expression for the gravitational force between the earth and an object lying on the surface of the earth. (2)

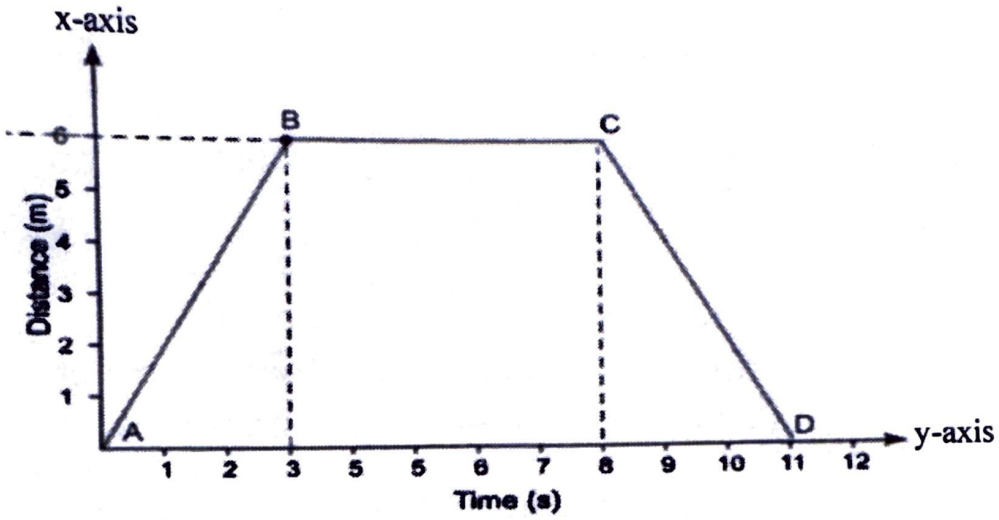
36. a) Derive the mathematical relation of Newton's second law of motion. (2)
b) Describe balanced forces with the help of an example. (1)

37. In the figure below the card is flicked with a push. It was observed that the card moves ahead while the coin falls in glass.




a) Name the law involved in this case. (1)
b) In the above figure if the coin is replaced by a heavy five-rupee coin, what will be your observation? Give a reason.(1)
c) If first law of motion holds true, why does a ball rolling on ground stop on its own? (1)

38. Suppose a squirrel is moving at a steady speed from the base of a tree towards some nuts. It then stays in the same position for a while, eating the nuts, before returning to the tree at the same speed. A graph can be plotted with distance on the x-axis and the time on y-axis.




Observe the graph carefully and answer the following questions.

a) Which part of the graph shows the squirrel moving away from the tree? (1)

b) Name the point on the graph which is 6 m away from the base of the tree. (1)

c) Which part of the graph shows that the squirrel is not moving? (2)

OR

c) Which part of the graph shows that the squirrel is returning to the tree? (2)

39. a) A person can jump higher on the surface of the Moon than on the Earth. Why? (1)

b) Give two differences between mass and weight. (2)

c) What is the mass of an object whose weight is 98 Newton? (2)