

HALF YEARLY EXAMINATION (2021-22)

SCIENCE

CLASS- IX

Time: 90 Minutes

Max. Marks 40

General Instructions:

1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

SECTION – A

Section – A consists of 24 questions. Attempt any 20 questions from this section.

The first attempted 20 questions would be evaluated.

- 1 The table shows the distance covered by three cars A, B and C at different time of a day.

	Car A	Car B	Car C
Time	Distance Travelled (km)	Distance Travelled (km)	Distance Travelled (km)
1:00 PM	0	0	0
1:30 PM	2	2	1
2:00 PM	5	4	3
2:30 PM	7	6	4

Which option classifies the cars in uniform motion and non-uniform motion?

A.

Uniform Motion	Non-Uniform Motion
Car A	Car C
Car B	

B.

Uniform Motion	Non-Uniform Motion
Car B	Car A
	Car C

C.

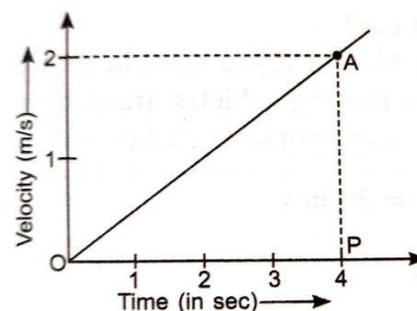
Uniform Motion	Non-Uniform Motion
Car A	Car B
	Car C

D.

Uniform Motion	Non-Uniform Motion
Car B	Car A
Car C	

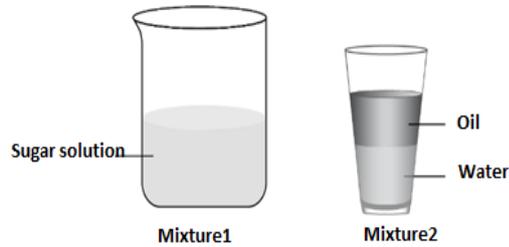
- 2 The velocity-time graph of a particle of mass 50 g moving in a definite direction is shown in the following figure. What is the distance travelled by the particle in 4 seconds?

- 0 m
- 2 m
- 4 m
- 6 m



- 3 A person rides a motor bike at the speed of 30m/ s. The person applies the brake and the velocity of motor bike comes down to 20m/ s in 3 s. What is the magnitude of acceleration of motor bike?
- A. -3.3 m/s^2
 - B. -6.6 m/s^2
 - C. 10 m/s^2
 - D. 16.6 m/s^2

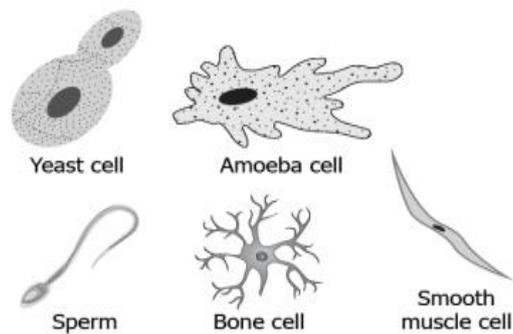
- 4 The image shows two mixtures.



Which of the following given statement is correct

- A. Mixture 2 is homogeneous because the components of a homogenous mixture always form separate layers.
 - B. Mixture 1 is homogeneous because the composition is uniform throughout the mixture.
 - C. Mixture 2 is heterogeneous because the components of a heterogeneous mixture are always liquid.
 - D. Mixture 1 is heterogeneous because the components of the mixture are not visible to the naked eye.
- 5 A tincture of iodine has antiseptic properties and is applied to heal cuts and wounds. Which of the following is a correct statement for the tincture of iodine?
- A. Iodine is the solute and alcohol is the solvent
 - B. Alcohol is the solute and iodine is the solvent
 - C. Any component can be considered as solute or solvent
 - D. Tincture of iodine is not a solution

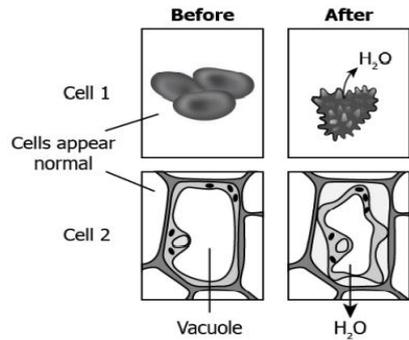
- 6 The following images show different types of cells.



What could be the reason for their different shapes and sizes?

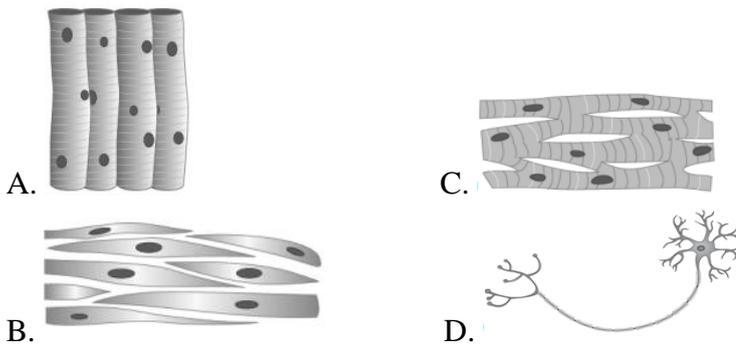
- A. Difference in their functions.
- B. Whether they are formed first or last in the body.
- C. They are all animal cells.
- D. Some are plant cells and some animal cells.

- 7 The image shows how the two cells appear before and after placing in a hypertonic solution.

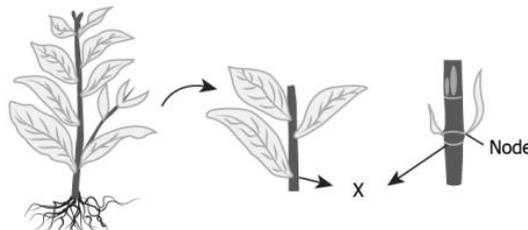


Based on the behaviour of the cell, identify the cell types.

- A. Cell 1: animal cell, Cell 2: plant cell
 - B. Cell 1: bacterial cell, Cell 2: plant cell
 - C. Cell 1: Plant cell, Cell 2: animal cell
 - D. Cell 1: animal cell, Cell 2: bacterial cell
- 8 What is the structure of a muscle that supports voluntary movements of the body?



- 9 The following image shows the stem of a plant.

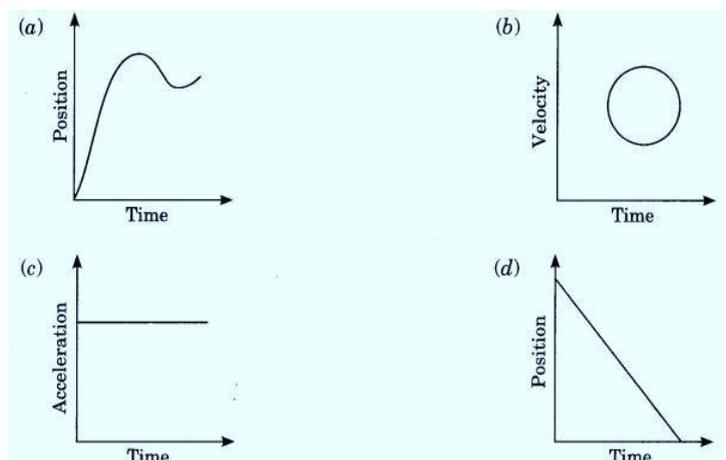


Which type of meristematic tissue is present at the labelled part 'X'?

- A. Apical meristem.
 - B. Intercalary meristem.
 - C. Lateral meristem
 - D. Both apical and lateral meristem
- 10 Read the given statements.
1. Many nerve cells bound together by connective tissue make up a nerve.
 2. Areolar connective tissue fills the space inside the organs and helps in repair of tissues.
 3. Glandular epithelium is formed by infolding of epithelial tissue.
 4. Smooth muscle fibres show characteristic of both striated and unstriated muscles.
 5. Skin epithelial cells are extremely thin and flat through which absorption and secretion occur.
- Select the INCORRECT statements.
- A. 4 and 5
 - B. 1, 3 and 5
 - C. 1, 2 and 3
 - D. 2, 3 and 4
- 11 Parenchyma cells containing air cavities are called:
- A. Aerenchyma
 - B. Sclerenchyma
 - C. Chlorenchyma
 - D. Collenchyma

- 12 What are suicidal bags?
 A. Plastids
 B. Mitochondria
 C. Lysosomes
 D. Ribosomes
- 13 Tracheids and vessels are found in:
 A. Xylem
 B. Cambium
 C. Cortex
 D. Phloem
- 14 Which of the following functions is performed by smooth endoplasmic reticulum?
 A. It helps expel excess water and wastes out of the cell.
 B. It helps produce ATP molecules.
 C. It helps digest small foreign particles.
 D. It helps detoxify the drugs.
- 15 A large amount of energy is required by the cell to carry out various cellular processes. Which part of mitochondria helps generate enough energy required for various chemical activities and how?
 A. The folds present in the inner mitochondrial membrane decrease the surface area for more ATP production.
 B. The folds present in the inner mitochondrial membrane increase the surface area for more ATP production.
 C. The folds present in the outer mitochondrial membrane increase the surface area for more ATP production.
 D. The folds present in the outer mitochondrial membrane decrease the surface area for more ATP production.
- 16 Which of these features is associated with plasma membrane?
 A. Permeable
 B. Impermeable
 C. Selectively permeable
 D. Both (a) and (b)
- 17 Identify simple tissues from the following.
 A. Parenchyma, xylem and collenchyma
 B. Parenchyma, collenchyma and sclerenchyma
 C. Parenchyma, xylem and sclerenchyma
 D. Parenchyma, xylem and phloem
- 18 A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to
 A. exerts larger force on the ball
 B. Reduce the force exerted by the balls on the hands
 C. increase the rate of change of momentum
 D. decrease the rate of change of momentum
- 19 Which of the following graphs is not possible?

- A. Graph (a)
 B. Graph (b)
 C. Graph (c)
 D. Graph (d)



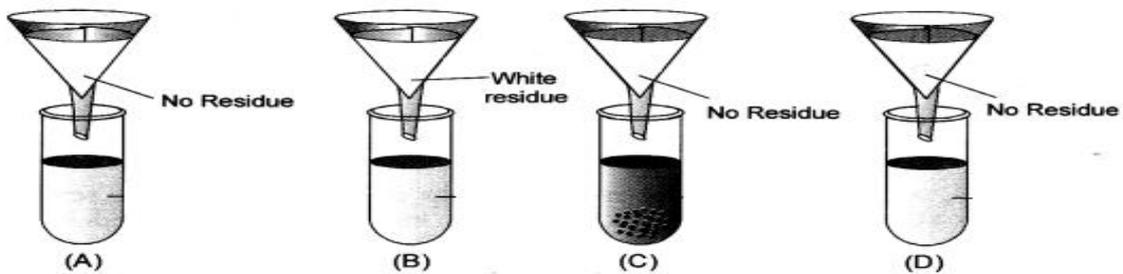
- 20 In which of the following cases of motions, the distance moved and the magnitude of displacement are equal?
- If the car is moving on a straight road
 - If the car is moving in Circular path
 - The pendulum is moving to and fro
 - The earth is revolving around the sun.

- 21 A student filled two glasses with water and orange food colour, and mixed them in each of the glasses as given below:

	Amount of water in glass	Amount of food color
GLASS 1	100 ml	5 mL
GLASS 2	100 mL	10 mL

Which water would appear darker of the two?

- Glass 1 because it has less solute
 - Glass 2 because it has more solute
 - Glass 1 because it has more solvent
 - Glass 2 because it has more solvent
- 22 Rashida prepared four mixtures A, B, C, and D to test the properties of mixtures. Given below is the experimental setup done by her to check the filterability of the mixtures.



Based on the observation, which of the following might contain a suspension?

- Setup A and D
 - Setup B
 - Setup C
 - None of the setup
- 23 Chromosomes are composed of:
- DNA and protein
 - DNA and sugar
 - Sugar and protein
 - Chromatin
- 24 Cell walls of sclerenchyma are rich in :
- Cellulose
 - Pectin
 - Lignin
 - Hemicellulose

SECTION - B

Section - B consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

- 25 How much momentum will a dumb-bell of mass 10 kg transfer to the floor if it falls from a height of 80 cm? Take its downward acceleration to be 10 m/s^2 .
- 40 kgm/s
 - 80 kgm/s
 - 100 kgm/s
 - 200 kgm/s
- 26 In circular motion the
- direction of motion is fixed.
 - direction of motion changes continuously.
 - acceleration is zero.
 - velocity is constant.

- 27 Which of the following is a function of Golgi body?
 A. Degradation and elimination of waste substances.
 B. Storage, modification, and packaging of products in vesicles.
 C. Synthesis of lipids and proteins.
 D. Providing rigidity and turbidity to the cell.
- 28 Which type of epithelium lines the inner surface of the respiratory tract?
 A. Squamous epithelium
 B. Ciliated columnar epithelium
 C. Columnar epithelium
 D. Cuboidal epithelium
- 29 In plants, food is made mainly by the leaf cells. Which organelles do these leaf cells have which enable them to make food?
 A. These cells have plastids with pigment chlorophyll that helps to photosynthesize.
 B. These cells have mitochondria that provide energy in form of ATP.
 C. These cells have colorless plastids which absorb sunlight and help the plant to photosynthesize.
 D. These cells have vacuoles which provide essential nutrients required for photosynthesis.
- 30 What is the basis of differentiation between a prokaryotic and a eukaryotic cell?
 A. Presence or absence of cytoplasm.
 B. Presence or absence of cell membrane.
 C. Presence or absence of genetic material.
 D. Presence or absence of membrane bound organelles.

Question No. 31 to 34 consist of two statements – Assertion (A) and Reason (R). Answer these questions 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

- 31 **Assertion:** the speedometer of a car measures the instantaneous speed of the car.
Reason: Average speed is equal to the total distance covered by an object divided by the total time taken.
- 32 **Assertion:** Silver bromide is made by combining silver and bromine elements.
Reason: Silver bromide is a pure substance
- 33 **Assertion:** Dust particles in air form aerosol.
Reason: Dust particles form the dispersion medium and the air is dispersed phase.
- 34 **Assertion:** Plasma membrane is selectively permeable.
Reason: Plasma membrane allows some molecules to pass through it more easily than others.
- 35 A boy walks 10m in straight path moving away from a lamp pole in a garden and walks 5m back on the same path. What is the displacement of the boy from the lamp pole?
 A. 0 m
 B. 5 m
 C. 10 m
 D. 15 m
- 36 A Ball P of mass m_1 travelling with a velocity u_1 collides with another Ball Q of mass m_2 at rest. After collision both the balls start moving in the same direction and the velocity of Ball P changes to v_1 and velocity of Ball Q changes to v_2 . If the momentum is conserved, which option correctly relates the momentum before and after the collision?
 A. $m_1 \cdot u_1 + m_1 \cdot v_1 = m_2 \cdot v_2$
 B. $m_1 \cdot u_1 = m_1 \cdot v_1 + m_2 \cdot v_2$
 C. $m_2 \cdot v_2 - m_1 \cdot u_1 = m_1 \cdot v_1$
 D. $m_1 \cdot u_1 = m_1 \cdot v_1 - m_2 \cdot v_2$

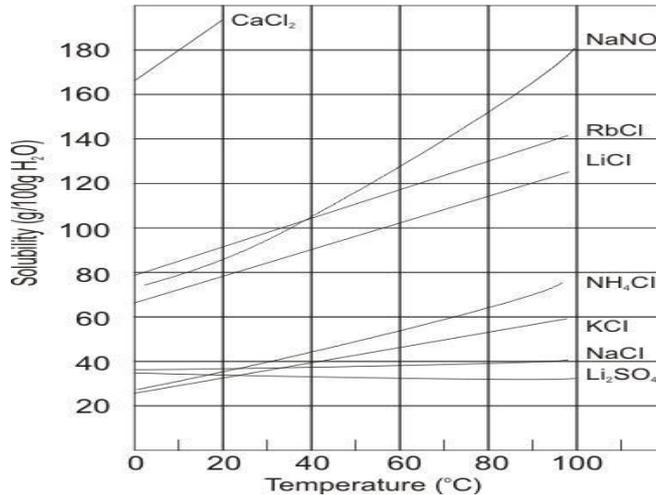
- 37 The image shows the forces acting on the car.



Which option defines the state of the car?

- A. car is accelerating
- B. car is slowing down
- C. car is moving with a constant velocity
- D. None of these

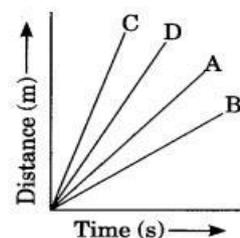
- 38 According to the graph given below, which of the following compounds is the least soluble in water at 15°C.?



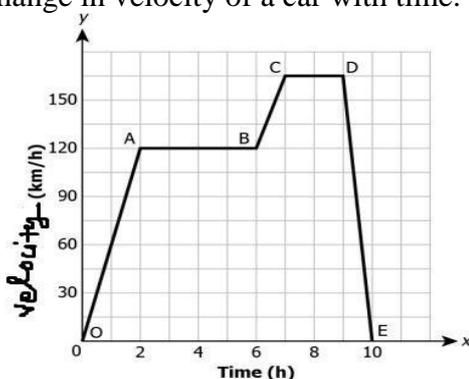
to the graph given below, which of the following is the least soluble in water at 15°C.?

- A. CaCl₂
 - B. KCl
 - C. NaCl
 - D. LiSO₄
- 39 4. Two substances, A and B combine together to form a third substance, A₂B according to the following reaction:
 $2A + B \rightarrow A_2B$
 Which of the following statements concerning this reaction are incorrect?
 (i) The product A₂B shows the properties of substances A and B.
 (ii) The product A₂B will always have a fixed composition.
 (iii) The product A₂B so formed cannot be classified as a compound.
 (iv) The product A₂B so formed is an element.
- A. (i), (ii) and (iii)
 - B. (ii), (iii) and (iv)
 - C. (i), (iii) and (iv)
 - D. (iii) and (iv)
- 40 Roots absorb water from soil by the process of:
- A. Plasmolysis
 - B. Diffusion
 - C. Osmosis
 - D. Endocytosis
- 41 An animal cell and a plant cell are placed in a sugar solution whose water concentration is higher than that of both the cells. What would likely happen?
- A. Both the animal and plant cells will burst.
 - B. Both the animal and plant cells will shrink.
 - C. Animal cell will swell while the plant cell will burst.
 - D. Animal cell will burst while the plant cell will swell.

- 42 Plasma membrane is composed of:
- Cellulose and lipids
 - Lipids and proteins
 - Lignin and cellulose
 - Cellulose and proteins
- 43 Four cars A, B, C and D are moving on a levelled road. Their distances versus time graphs are shown in the adjacent figure. Choose the correct statement.



- Car A is faster than car D.
 - Car B is the slowest.
 - Car D is faster than car C.
 - Car C is the slowest.
- 44 When the driver of a fast moving car suddenly applies brakes, the passenger in the car
- fall forward
 - fall backward
 - are not affected
 - none of the above
- 45 The graph shows the change in velocity of a car with time.



Which portion of the graph shows the negative acceleration for the car?

- OA
 - AB
 - CD
 - DE
- 46 Which of the following are physical changes?
- Melting of iron metal
 - Rusting of iron
 - Bending of an iron rod :
 - Drawing a wire of iron metal
- (i), (ii) and (iii)
 - (i), (ii) and (iv)
 - (i), (iii) and (iv)
 - (ii), (iii) and (iv)
- 47 The teacher instructed students to prepare a 50% (mass by volume) solution of sodium hydroxide (NaOH).

Solutions 1,2,3 and 4 were prepared by students

Solutions	Amount of NaOH	Amount of water
1	50 g	100 mL
2	50 g	100 g
3	50 g	95 mL
4.	50 g	95 g

Which one of the above is the desired solution

- A. Solution 1
 - B. Solution 2
 - C. Solution 3
 - D. Solution 4
- 48 An organism has poorly defined nuclear membrane in its cells. This organism could be a/an:
- A. Bacteria
 - B. Animal
 - C. Fungi
 - D. Bird

SECTION – C

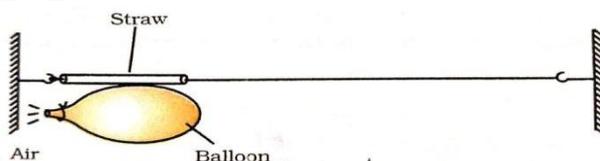
Section- C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section.

The first attempted 10 questions would be evaluated.

Case

Noor, a young student, was trying to demonstrate an activity based on Physics laws of motion. She took a rubber balloon and inflated it fully. She tied its neck using a thread and adhesive tape and fixed a straw on the surface of this balloon. She took a thread, passed it through the straw and held it in one hand or fixed it on the wall. She asked her friend to hold the other end of the thread or fixed it on a wall at some distance. This arrangement is shown in the figure.

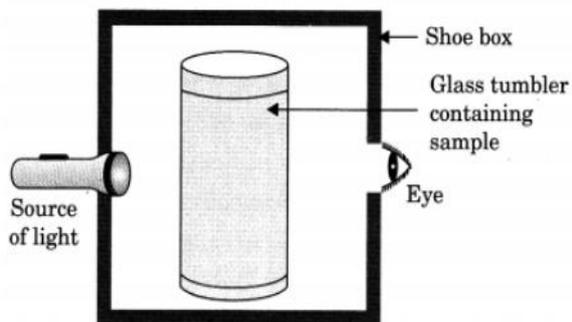
Then she removed the thread tied on the neck of balloon and allowed the air to escape from the mouth of the balloon.



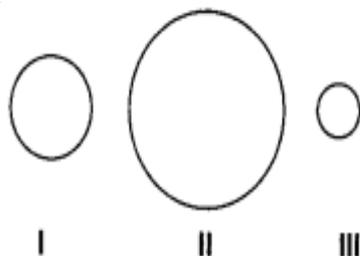
- 49 In which direction will the balloon move?
- A. Right
 - B. Left
 - C. Upward
 - D. Downward
- 50 Which law of Newton is applicable here?
- A. Newton's first law
 - B. Newton's second law
 - C. Newton's third law
 - D. None of the laws
- 51 Action-Reaction forces-
- A. act on the same body
 - B. act on different bodies
 - C. act along different lines
 - D. act in the same direction.
- 52 Which of the following is an incorrect statement?
- A. Mass is measure of inertia of a body.
 - B. Newton's first law of motion is the law of inertia.
 - C. Unbalanced force produces constant velocity.
 - D. Newton's third law talks about the direction of the force.

Case

A group of students took an old shoebox and covered it with black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. A white-coloured sample of an unknown mixture in a beaker/tumbler was placed in the box as shown in the figure. They were amazed to see that the sample of the mixture taken in the tumbler was illuminated inside the box.



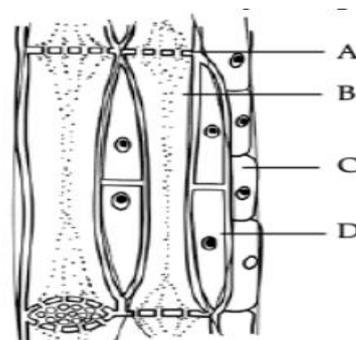
- 53 What is the name of the process responsible for the illumination of the mixture?
- Dispersion Effect
 - Centrifugation
 - Tyndall Effect
 - Chemical Effect
- 54 What type of mixture the white-coloured sample taken in the beaker/tumbler can be?
- True solution
 - Suspension
 - Colloids
 - Either a suspension or a colloid
- 55 The unknown sample of the mixture in the tumbler was replaced by a sugar solution in water. Which of the following change will be observed inside the box.
- No change will be observed.
 - No illumination will be observed in the tumbler inside the box
 - The intensity of the illuminated light from the sample will increase.
 - The intensity of the illuminated light from the sample will decrease.
- 56 With reference to the image given below, the correct designation representing the relative particle size in different types of mixtures is :



- I - True solution, II- Colloids, III- Suspension
- I - True solution, II- Suspension, III- Colloids
- I - Colloids, II- True solution, III- Suspension
- I - Colloids, II- Suspension, III- True solution

Case

The diagram given below shows a tissue which has made survival of complex plants possible in the terrestrial environment. Study its various parts and answer the questions that follow.



- 57 Which of the following is the tissue shown in the diagram?
- Xylem
 - Epidermis
 - Meristem
 - Phloem

- 58 A Vascular bundle is constituted by:
- A. Only Xylem
 - B. Only Phloem
 - C. Both Xylem and Phloem
 - D. Only Epidermis
- 59 Identify the parts A, B, C and D.
- A. **A**- Companion Cell, **B**- Sieve Tube, **C**- Sieve Plate, **D**- Phloem Parenchyma.
 - B. **A**- Phloem Parenchyma, **B**- Companion Cell, **C**- Sieve Tube, **D**- Sieve Plate
 - C. **A**- Sieve Plate, **B**- Sieve Tube, **C**- Phloem Parenchyma, **D**- Companion Cell
 - D. **A**- Sieve Tube, **B**- Phloem Parenchyma, **C**- Sieve Plate, **D**- Companion Cell
- 60 What would happen if this tissue is removed from the plant's body?
- A. Plant will not be able to transport water and minerals from roots to upper body parts.
 - B. Plant will not be able to protect itself from harsh environment conditions.
 - C. Plant leaves will not be able to make food through photosynthesis.
 - D. Plant will not be able to transport food from leaves to other parts of its body.