

Time: 1.5hrs

General Instructions:

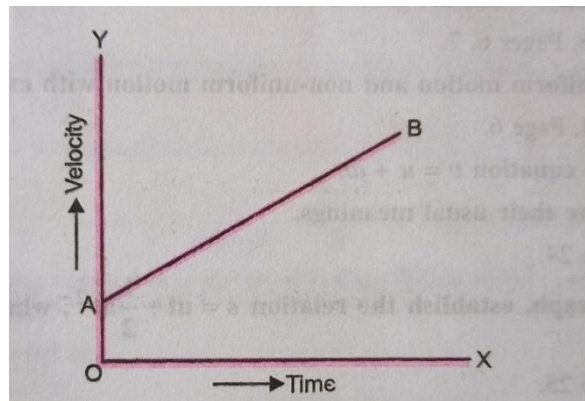
1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

SECTION - A

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

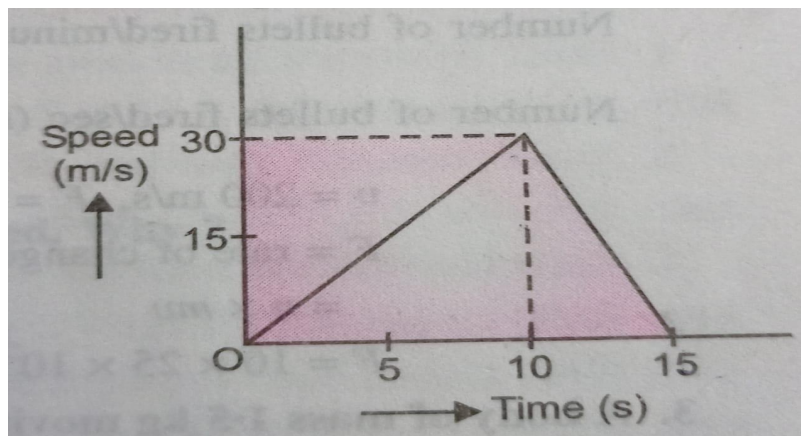
The first attempted 20 questions would be evaluated.

Q1. From the given v-t graph with constant slope, it can be inferred that the object is moving with:



- a) Constant acceleration
- b) constant velocity
- c) constant retardation
- d) None of the above

Q2. A body of mass 10 kg starting from rest, accelerates uniformly to a speed of 30 m/s in 10 sec. Brakes are applied and the body stops in the next 5 sec. The accelerating force from 0 to 10 sec will be



- a) 30 N
- b) 20 N
- c) 10 N
- d) 100 N

Q3. An athlete completes one round of a circular track of diameter 200m in 40 sec. What will be the distance covered at the end of 2 min 20 sec?

- a) 2200m
- b) 200m
- c) 1500m
- d) 3000m

Q4. According to third law of motion, action and reaction

- a) always act on the same body
- b) always act on different bodies in opposite directions
- c) have same magnitude and direction
- d) act on either body at normal to each other

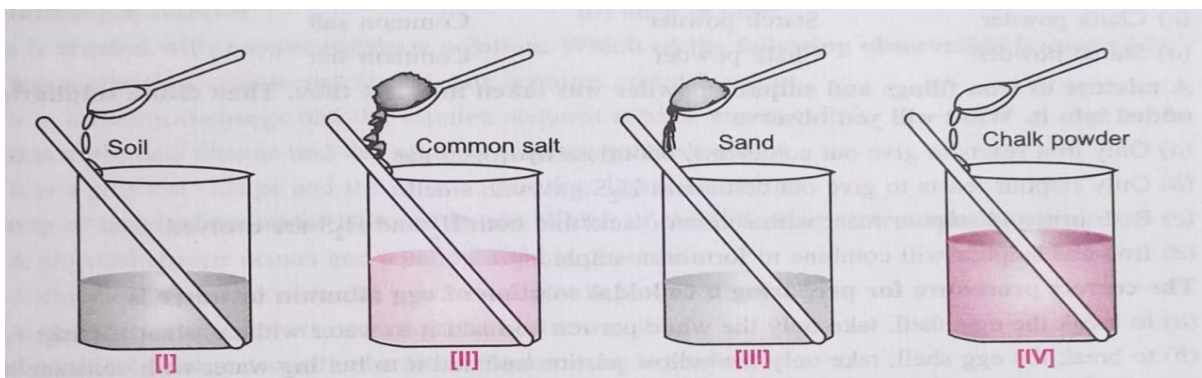
Q5. How will the equations of motion for an object moving with 'uniform velocity' change?

a)	$v=u$	$s= \frac{1}{2} at^2$	$v^2=u^2$
b)	$v=u$	$s=ut$	$v^2=u^2$
c)	$v=ut$	$s= \frac{1}{2} at$	$v^2=u^2 + 2as$
d)	$v=at$	$s=ut$	$v^2=u^2$

Q6. A body thrown vertically upward reaches a maximum height h . It then returns to ground with the same path. The displacement of the body is :

- a) Zero
- b) $h/2$
- c) $2h$
- d) h

Q7. The following substances are added to water in a beaker as shown below. Stir it well. A true solution is formed in the beaker:



- a) I

- b) II
- c) III
- d) IV

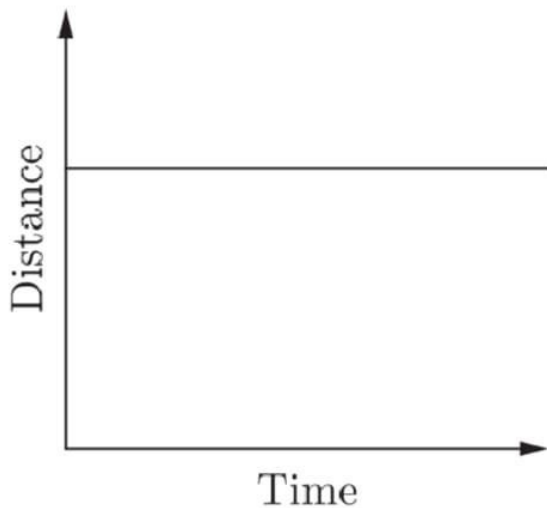
Q8. A solution contains 16g of urea in 120g of solution. The mass by mass percentage of solution is;

- a) 33.3%
- b) 50%
- c) 13.3%
- d) 78%

Q9. A student was given three powdered materials, which were sugar, soil and starch powder in three packets and forgot to label them. He did not want to taste them as it was dangerous. He took boiled water in three beakers and started to add these materials into the beakers. He puts a small amount of contents of packet I in beaker I, those of packet II in beaker II and those of packet III in beaker III. He stirred the contents of each beaker without keeping it undisturbed and observed that beaker I gave a translucent solution, beaker II gave a transparent solution while content of beaker III was opaque. Which of the following conclusions will you draw?

Option	Packet I	Packet II	Packet III
a)	Sugar	Soil	Starch Powder
b)	Starch Powder	Sugar	Soil
c)	Soil	Starch Powder	Sugar
d)	None of the above		

Q10. The distance-time graph of an object is shown in the graph. The object



- a) is at rest
- b) moves with a constant speed
- c) moves with variable velocity
- d) moves with a constant acceleration

Q11. A man is standing on a boat in still water. If he walks towards the shore, the boat will

- a) move away from the shore
- b) remain stationary
- c) move towards the shore
- d) sink

Q12. Which of the following are metalloids?

- 1. Boron
- 2. Sodium
- 3. Silicon
- 4. Chlorine
- 5. Germanium

- a) 2 and 4
- b) 1 and 4
- c) 3 and 5
- d) 1,3 and 5

Q13. The size of colloidal solution is in the range of

- a) 1-100nm
- b) 100-1000nm
- c) $10^{-5}\text{m} - 10^{-7}\text{m}$
- d) $10^7\text{m}-10^9\text{m}$

Q14 Two chemical species X and Y combine together to form a new substance P which contains both X and Y as

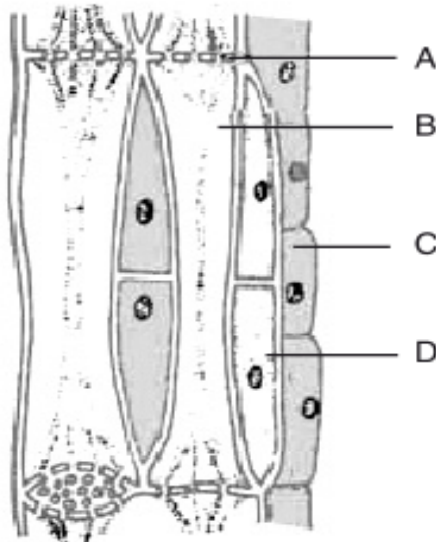


X and Y can not be broken down into simpler substances by simple chemical reactions. Which of the following concerning the species X, Y and P are correct?

- i) P is a compound
- ii) X and Y are compounds
- iii) X and Y are elements
- iv) P has a fixed composition

- a) i), ii), iii)
- b) i), ii), iv)
- c) ii), iii), iv)
- d) i), iii), iv)

Q15. Carefully study the diagram of the phloem tissue with labels A, B, C and D. Select the option which gives correct identification and main function and /or characteristic of A,B,C & D



- a) A- Sieve Plate: It contain perforations that allows conduction of food from one sieve tube to another.
- b) B- Sieve tubes: These are the tubular cells that helps in conduction of water and minerals.
- c) C- Phloem parenchyma: These are the dead cells that help in storage of food.
- d) D- Companion cell: Companion cells have no cytoplasm and nucleus.

Q16. Companion cells are associated with

- a) Tracheid
- b) Sieve tube
- c) Guard cells
- d) Xylem vessel

Q17. Cork cambium results in the formation of cork which becomes impermeable to water due to the accumulation of -

- a) Resins
- b) Suberin
- c) Lignin
- d) Tannin

Q18. Identify the animal tissues from the given descriptions.

- a) Tissue A – Cells are filled with fat globules and the tissues act as an insulator.
- b) Tissue B- Has cylindrical branched cells and the tissues show rhythmic contraction and relaxation throughout life.

Select the correct option

- a) A- Adipose Tissue, B- Skeletal muscle
- b) A- Areolar Tissue, B- Smooth muscle
- c) A- Areolar tissue, B- Cardiac muscle
- d) A- Adipose tissue, B- Cardiac muscle

Q19. A fibrous connective tissue which attaches bone to bone _____ .

- a) Ligaments
- b) Fibers
- c) Joints
- d) Tendons

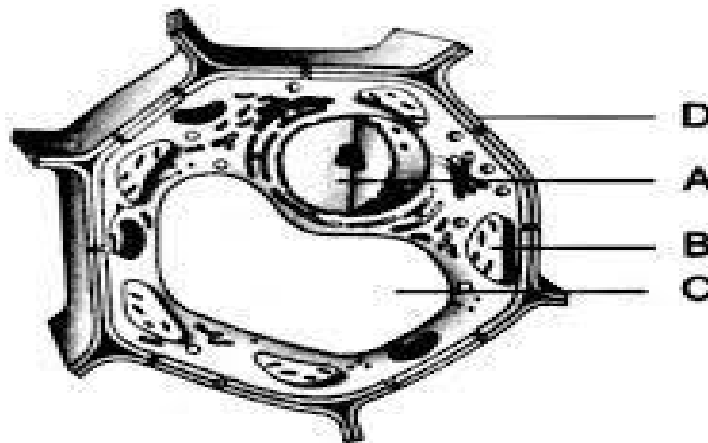
Q20. A student was asked to write the characteristics of a nerve cell after viewing it under the microscope. The correct features will be

- a) Oval cells with lobed nucleus.
- b) Spindle shaped cells with bands.
- c) Loosely packed cells floating in matrix.
- d) A cell body with branched cytoplasmic extensions at one end and a long projection at the other end

Q21. _____ Epithelial tissue presents at places needing protection from scrapes and abrasions such as the skin.

- a) Cuboidal epithelium
- b) Columnar epithelium
- c) Simple Squamous epithelium
- d) Stratified Squamous epithelium

Q22. Given below is a diagrammatic sketch of a cell. Identify it as plant and animal cell. Also state the function of part marked C in it



- a) Animal Cell, C- Store substances, typically either waste or useful substances.
- b) Plant Cell, C- Store substances, typically either waste or useful substances.
- c) Animal cell, C- Contains genetic material that helps in inheritance of characters from one generation to another.
- d) Plant cell, C- Contains genetic material that helps in inheritance of characters from one generation to another.

Q23. A plasmolyzed cell can be deplasmolyzed by placing it in

- a) Isotonic solution

- b) Saturated solution
- c) Hypotonic solution
- d) Hypertonic solution

Q24. The Proteins and Lipids, required for membrane biogenesis are manufactured by

- a) Endoplasmic reticulum
- b) Golgi apparatus
- c) Plasma membrane
- d) Mitochondria

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.

Q25. Soda water is a solution of carbon dioxide in water. What is this solution composed of

- a) Liquid solute in a gaseous solvent
- b) Gaseous solute in a liquid solvent
- c) Liquid solute in a liquid solvent
- d) Gas in suspended form in solid

Q26. What is the name of the insoluble substance which settles to the bottom of its container?

- a) Solute
- b) Solvent
- c) Sediment
- d) none of the above

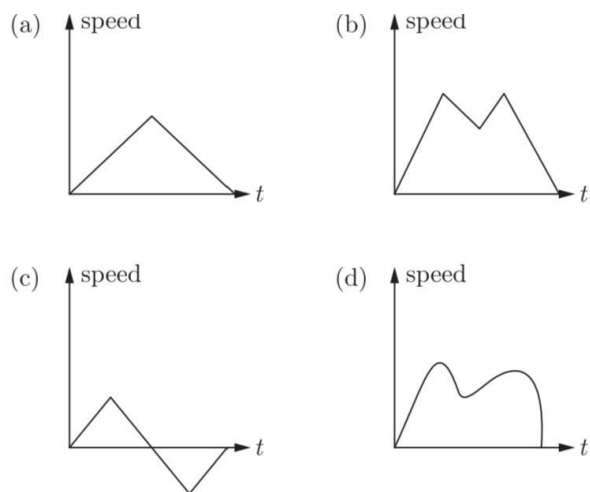
Q27. Match the following

Non- uniform acceleration	a) Unequal distance in equal time
	b) Equal velocity change in equal time
	c) Unequal velocity change in equal time
	d) Equal distance in equal time

Q28. A quantity has a value of -6.0 m/s. It may be the

- a) speed of particle
- b) velocity of particle
- c) position of particle
- d) displacement of particle

Q29. Which of the following speed time graph is not possible



- a) Option (a)
- b) Option (b)
- c) Option (c)
- d) Option (d)

Q30. Match the following

Momentum	a) Kgms^{-2}
	b) Kgms^{-1}
	c) Kg^{-1}ms
	d) Kgm^{-1}s

Q31. How much force acts on a body whose momentum (p) is constant with time (t)

- a) 0
- b) $p/2t$
- c) $2p/t$
- d) None of the above

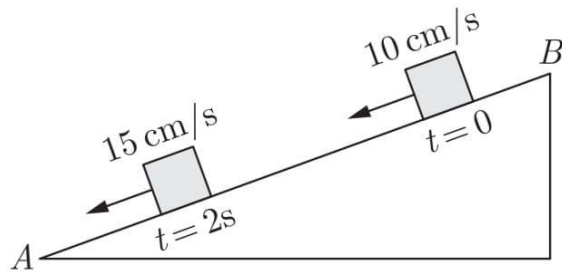
Q32. A man getting down a running bus falls forward because

- a) Due to inertia of rest, the road is left behind and man reaches forward.
- b) Due to inertia of motion the upper part of the body continues to be in motion in forward direction while feet come to rest as soon as they touch the road.
- c) He leans forward as a matter of habit.
- d) Of the combined effect of all the three factors stated in a), b) and c).

Q33. Match the type of colloid in the following question

Dispersed Phase: Liquid Dispersing Medium: Liquid	a) Aerosol
	b) Gel
	c) Emulsion
	d) Solid sol

Q34. An object is sliding down an inclined plane. The velocity changes at a constant rate from 10 cm/s to 15 cm/s in two seconds. What is its acceleration?



- a) 10 cm/s^2
- b) 2.9 cm/s^2
- c) 2.5 cm/s^2
- d) 40 cm/s^2

Question No. 35 to 38 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

Q35. Assertion: Displacement of an object can be either positive, negative or zero.

Reason: Displacement has both magnitude and direction.

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both Assertion and Reason are false.

Q36. Assertion: A saturated solution becomes unsaturated on heating.

Reason: A saturated solution is a solution in which more and more solute can be dissolved at room temperature.

- a) Both assertion and reason are true and reason is the correct explanation of assertion.
- b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- c) Assertion is true but reason is false.
- d) Both Assertion and Reason are false.

Q37. Assertion- The inner lining of intestine has tall epithelial cells.

Reason- Columnar epithelium facilitates absorption and secretion.

- 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

Q38. Assertion- Mitochondria and chloroplasts are semi-autonomous organelles.

Reason- They are formed by division of pre- existing organelles as well as contain DNA but lack protein synthesizing machinery.

- 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

Q39. Kidney beans soaked in water for overnight got swollen due to

- (i) Osmosis
- (ii) Diffusion
- (iii) Endosmosis
- (iv) Exosmosis

Choose the correct option among the following:

- (a) Only (iii)
- (b) Both (i) and (iii)
- (c) Both (i) and (iv)
- (d) Only (i)

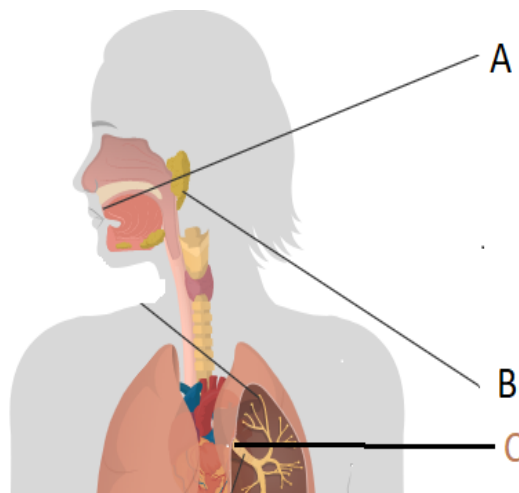
Q40. vacuoles are a kind of storage sacs that are very large sized in plant cell as compared to that in the animal cell. Which among the following is not a function of the vacuole?

- (a) They help to store the toxic metabolic by-products of the plant cell.
- (b) They provide turgidity and rigidity to the plant cell.
- (c) They help the plant in its growth by the process of cell division.
- (d) It provides support and help in storage.

Q41. Contractile proteins are found in which of the following tissue

- a) Bones
- b) Blood
- c) Muscles
- d) Cartilage

Q42. Identify the option that indicates the correct type of epithelial tissue present in location A (lining of mouth), B (ducts of salivary gland) and C (Bronchi) respectively.



- a) (A)-Squamous epithelium, (B)-Columnar epithelium, (C)- Cuboidal epithelium

- b) (A)-Squamous epithelium, (B)-Cuboidal epithelium, (C)-Ciliated columnar epithelium
- c) (A)- Cuboidal epithelium, (B)- Squamous epithelium, (C)- Ciliated Columnar epithelium
- d)(A)- Squamous epithelium, (B)-Columnar epithelium, (C)- Glandular epithelium

Q43. Among the following statements, which one is incorrect?

- a) Golgi apparatus is involved with formation of lysosomes.
- b) Nucleus, mitochondria and plastid have DNA; hence they are able to make their own structural proteins.
- c) Lysosomes are called the suicide bags as they eat up their own cells.
- d) Cytoplasm is also known as protoplasm.

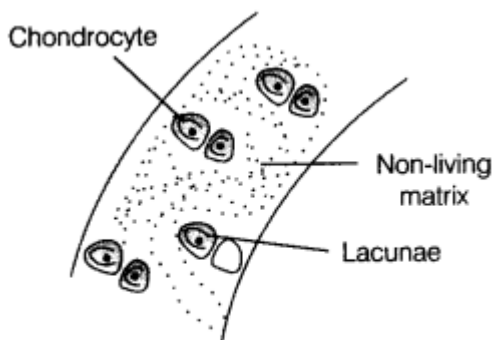
Q44. Lipids are manufactured by

- a) Rough endoplasmic reticulum
- b) Golgi bodies
- c) Smooth endoplasmic reticulum
- d) Mitochondria

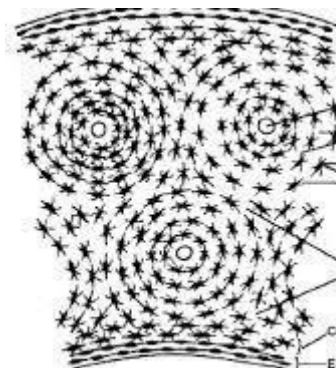
Q45. Which muscles are involuntary in action?

- (i) Striated muscles
 - (ii) Smooth muscles
 - (iii) Cardiac muscles
 - (iv) Skeletal muscles
- a) (i) and (ii)
 - b) (ii) and (iii)
 - c) (ii) and (iv)
 - d) (i) and (iv)

Q46. Identify the type of tissues given in the diagram. Differentiate between them in terms of the composition of their matrix.



Tissue A



Tissue B

- a) A- Matrix contains Calcium and phosphorus, B- Matrix contains sugars and protein.
- b) A- Matrix contain Proteins and Lipids, B- Matrix contain Calcium and Potassium
- c) A- Matrix contains sugars and protein, B- Matrix contains calcium and phosphorus.

d) A- Matrix contains protein and Lipids, B- Matrix contains calcium and phosphorus.

Q47. Ram's mother was going to make pickles. For this she cut the vegetables into small pieces and put them in the sun for a few hours. Rahul was observing all her activities very curiously and asked his mother why she had put the salted vegetables in the sun. Among the following, what might be the most appropriate answer for his question?

- a) So that the pickle may get extra flavour.
- b) So that the cut vegetables may absorb the vitamin D as a nutrient from the sun rays.
- c) So that the vegetables may lose all the water by diffusion and evaporation and become dry.
- d) So that the salt may get evenly and properly absorbed by the vegetables.

Q48. Which of the following statements is not related to the endoplasmic reticulum?

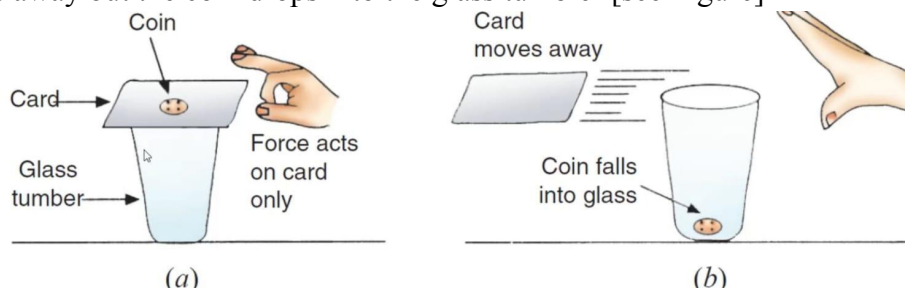
- (a) It behaves as a transport channel for proteins between nucleus and cytoplasm.
- (b) It transports materials between various regions in cytoplasm.
- (c) It can be the site of energy generation.
- (d) It can be the site of some biochemical activities of the cell.

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.

CASE STUDY 1: Read the case study carefully. Based on this Q49 to Q52 are given below. Choose the correct options.

We take a glass tumbler and place a thick square card on its mouth as shown in Figure (a). A coin is then placed above this card in the middle. Let us flick the card hard with our fingers. On flicking, the card moves away but the coin drops into the glass tumbler [see Figure]



Q49. Give reason for the above observation.

- a) The coin possesses inertia of rest, it resists the change and hence falls in the glass.
- b) The coin possesses inertia of motion, it resists the change and hence falls in the glass.
- c) The coin possesses inertia of rest, it accepts the change and hence falls in the glass.
- d) The coin possesses inertia of motion, it accepts the change and hence falls in the glass.

Q50. If the above coin is replaced by a heavy five rupee coin, what will be your observation? Give a reason.

- a) Heavy coin will possess more inertia so it will not fall in the tumbler.

- b) Heavy coin will possess less inertia so it will fall in the tumbler.
- c) Heavy coin will possess more inertia so it will fall in the tumbler.
- d) Heavy coin will possess less inertia so it will not fall in the tumbler.

Q51. Name the law which provides the formula $F = ma$ for measuring the force.

- a) Law of conservation of mass
- b) Newton's third law of motion
- c) Newton's first law of motion
- d) Newton's second law of motion

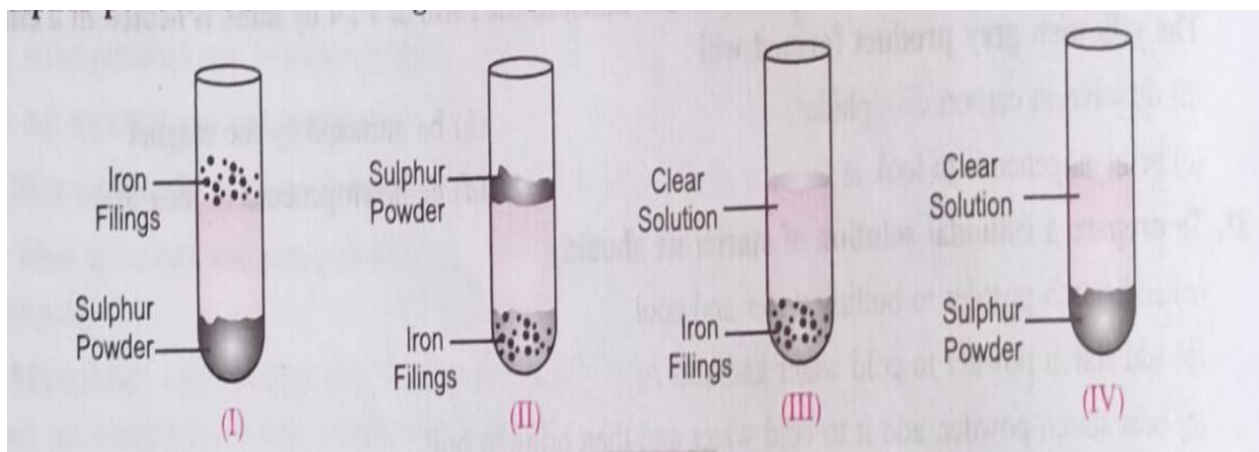
Q52. Name the law involved in the fall of coin:

- a) Newton's first law of motion
- b) Newton's third law of motion
- c) Law of conservation of energy
- d) None of the above

CASE STUDY 2: Read the case study carefully. Based on this Q53 to Q56 are given below. Choose the correct options.

A mixture is obtained when two or more elements are mixed together without formation of any new compound. It shows the properties of its constituents that can be understood by bringing a magnet near it. On the other hand, Compounds are formed as a result of chemical change when iron and sulphur were heated together. There is formation of new compound and the newly formed iron sulphide has properties altogether different from those of its constituents, when a mixture and compound both were made to react with carbon disulphide respectively. It shows different results.

Q53. Carbon disulphide was added to each test tube containing a mixture of iron filings and sulphur powder as shown in the given diagram



The correct observation is represented in the diagram:

- a) I
- b) II
- c) III

d) IV

Q54. The correct set of observations for a mixture of iron and Sulphur is:

Option	Nature of the mixture	Effect of moving a magnet in the mixture
(a)	Homogeneous	Nothing will happen
(b)	Heterogeneous	Iron filings will not stick
(c)	Heterogeneous	Iron filings will stick
(d)	Heterogeneous	Both iron filings and sulphur will stick

a) Option (a)

b) Option (b)

c) Option (c)

d) Option (d)

Q55. Iron and Sulphur were heated in a test tube to form a new compound. In that dilute hydrochloric acid is added. It is observed that:

a) A colorless gas having rotten egg like smell evolved.

b) After the reaction, solution in the tube had blue color.

c) A reddish brown gas evolved

d) None of the above

Q56. When we start heating a mixture of sulphur powder and iron fillings, we would observe that

a) Sulphur starts melting

b) Iron fillings start melting

c) Mixture evaporates

d) None of the above

Case Study 3: Read the case study carefully. Based on this Q57 to Q60 are given below. Choose the correct options.

The movement of substances in and out of cells (nutrients in and toxins out, for example) is a very important part of biology as without it no cell and so no organism could live very long. Substances can only cross the protective cell membrane by diffusion, osmosis or active transport. For cell transport, diffusion is the movement of small molecules across the cell membrane. The difference in the concentrations of the molecules in the two areas is called the concentration gradient. The kinetic energy of the molecules results in random motion, causing diffusion. It is the random motion of the molecules that causes them to move from an area of high concentration to an area

with a lower concentration. Diffusion will continue until the concentration gradient has been eliminated. At equilibrium, there is equal movement of materials in both directions.

Q57. What is an isotonic solution?

- a) A solution whose concentration is lower than the internal concentration.
- b) A solution whose concentration is the same as compared to internal concentration.
- c) A solution whose concentration is more than the internal concentration.
- d) None of the above.

Q58. What happens when dry apricots are left for some time in pure water and later transferred to the sugar solution?

- a) Dry apricots first swell due to endosmosis and then shrink due to exosmosis
- b) Dry apricots first shrink due to endosmosis and then shrink due to exosmosis
- c) Dry apricots first swell due to exosmosis and then shrink due to endosmosis
- d) Dry apricots first shrink due to endosmosis and then swell due to exosmosis

Q59. While performing an experiment on osmosis, Aman kept cells of onion peel and RBC separately in hypotonic solution. She observed that RBC burst while cells of onion peel resisted bursting to some extent. What could be the reason for this observation.

- a) RBCs burst because they do not possess single large vacuole, whereas onion peel cells possess a single large vacuole.
- b) RBCs burst because their cell membrane is thin and delicate, whereas onion peel cell membrane is thick and rigid.
- c) RBCs burst because they do not possess cell wall, whereas onion peel cells possess cell wall.
- d) None of the above

Q60. Plasmolysis in a plant cell is defined as

- a) Breakdown of plasma membrane in hypotonic medium.
- b) Shrinkage of cytoplasm in hypertonic medium.
- c) Shrinkage of nucleoplasm
- d) None of the above.