

# CBSE Sample Question Paper Term 1

Class – IX (Session : 2021 - 22)

**SUBJECT - SCIENCE - 086 - TEST - 02**

**Class 09 - Science**

**Time Allowed: 1 hour and 30 minutes**

**Maximum 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

**Attempt any 20 questions**

1. Which of the following are physical changes? **[0.8]**
  - i. Melting of iron metal
  - ii. Rusting of iron
  - iii. Bending of an iron rod
  - iv. Drawing a wire of iron metal

a) (i), (ii) and (iii)	b) (ii), (iii) and (iv)
c) (i), (ii) and (iv)	d) (i), (iii) and (iv)
2. We use glycerine in temporary mount of the material because: **[0.8]**

a) it increases the clarity of the material	b) it increases the beauty
c) it avoids drying of the material	d) it provides the medium for floating the material
3. Girth of stem increases due to **[0.8]**

a) apical meristem	b) vertical meristem
c) intercalary meristem	d) lateral meristem
4. A body starting at a point, say A, reaches, say B, ahead in a straight line and returns back to A. Then there is: **[0.8]**

a) negative displacement	b) cannot be said
c) zero displacement	d) positive displacement
5. Newton's third law tells that \_\_\_\_\_ force does not exist. **[0.8]**

- a) motion  
c) movement
- b) isolated  
d) momentum
6. A student mixed the white of an egg with water and stirred it well. After sometimes he observe that: **[0.8]**
- a) egg white settles down at the bottom  
c) a translucent mixture is formed
- b) a transparent solution is formed  
d) egg white floats on the surface of the water
7. The cell sap in plant cells consists of: **[0.8]**
- a) water + organic substances  
c) water only
- b) both (water only) and (water + inorganic substances)  
d) water + inorganic substances
8. Parenchyma which contains chlorophyll and helps in photosynthesis is called \_\_\_\_\_. **[0.8]**
- a) Collenchyma  
c) Sclerenchyma
- b) Aerenchyma  
d) Chlorenchyma
9. Which of the following statements is not true? **[0.8]**
- A. motion is always uniform  
B. motion is a change of position  
C. motion can be described in terms of displacement  
D. motion can be uniform or non-uniform
- a) (B)  
c) (D)
- b) (A)  
d) (C)
10. The unit of momentum can be expressed as **[0.8]**
- a)  $\frac{N}{s}$   
c)  $kg\ s^2/m$
- b) N - s  
d)  $kg\ m/s^2$
11. A mixture of sulphur and carbon disulphide is **[0.8]**
- a) heterogeneous and shows Tyndall effect  
c) homogeneous and shows Tyndall effect
- b) heterogeneous and does not show Tyndall effect  
d) homogeneous and does not show Tyndall effect
12. Amoeba acquires its food through: **[0.8]**
- a) Exocytosis & Endocytosis  
c) Plasmolysis
- b) Exocytosis  
d) Endocytosis
13. Ligaments and Tendons are formed of **[0.8]**
- a) Epithelial tissue  
c) Muscular tissue
- b) Cartilage  
d) Connective tissue
14. Fill in the gap using given analogy.(i) Momentum conservation : F = 0 (ii) Uniform motion in **[0.8]**





32. **Assertion (A):** A fruit when unripe is green but it becomes beautifully coloured when ripe. **[0.8]**  
**Reason (R):** The fruit becomes beautifully coloured due to Chromoplasts change to chloroplasts.
- 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.
33. **Assertion (A):** The cells of non-striated muscles or smooth muscles are spindle-shaped, uni-nucleated, elongated, and have no striations. **[0.8]**  
**Reason (R):** They are found within the walls of elementary canal, bladder, and blood vessels.
- 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.
34. **Assertion (A):** If a particle is moving with constant velocity, then the average velocity for any time interval is equal to instantaneous velocity. **[0.8]**  
**Reason (R):** If average velocity of a particle moving on a straight line is zero for a given time interval, then instantaneous velocity at some instant within this interval may be zero.
- 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.
35. **Assertion (A):** If the plasma membrane ruptured the entire cell content (cytoplasm, cell organelles) will be lost and the cell will die. **[0.8]**  
**Reason (R):** In animals, active transport of potassium is done within a body for protein synthesis.
- 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.
36. A mixture of iron filings and sulphur is heated in a hard boiling tube. Which of the following will be observed? **[0.8]**
- a) Iron will melt first      b) Sulphur will melt first  
c) The mixture becomes red hot without melting      d) Mixture sublimes
37. A student took 5 g of powdered arhar dal in a test tube and added 5 ml water into it. She shook the test tube vigorously. After adding a few drops of HCl she observed that the dal tested positive for adulteration with metanil yellow. The observation she noted was: **[0.8]**
- a) the water turned brown      b) the water turned pink  
c) the water turned blue-black      d) there was no colour change in the water

38. The columnar epithelial cells possess cilia in [0.8]  
a) intestine b) digestive tract  
c) stomach d) respiratory tract
39. Action reaction forces act: [0.8]  
a) on the same body b) on different bodies  
c) in the same direction d) along different bodies
40. Fireman holds a hose by exerting a \_\_\_\_\_. [0.8]  
a) momentum b) friction  
c) force d) an acceleration
41. Which of the following is known as the "physical basis of life"? [0.8]  
a) Nucleolus b) Mitochondria  
c) Gene d) Protoplasm
42. The epithelium is separated from the underlying connective tissue by [0.8]  
a) thick deposition of fat b) mucosa  
c) vesicles d) basement membrane
43. The one which has the least inertia among the following: 1 kg stone, 2 kg ball, a train compartment and a cup of tea is [0.8]  
a) 2 kg ball b) 1 kg stone  
c) a train compartment d) a cup of tea
44. The components of compound can be separated by using [0.8]  
a) chemical method b) physical method  
c) none of these d) cannot be separated by using any method.
45. Which of the following are homogeneous in nature [0.8]  
i. ice  
ii. wood  
iii. soil  
iv. air  
a) (iii) and (iv) b) (i) and (iii)  
c) (i) and (iv) d) (ii) and (iv)
46. Which of these options are not a function of Ribosomes? [0.8]  
i. It helps in manufacture of protein molecules  
ii. It helps in manufacture of enzymes  
iii. It helps in manufacture of hormones  
iv. It helps in manufacture of starch molecules  
a) (iii) and (iv) b) (iv) and (i)

- c) (i) and (ii) d) (ii) and (iii)
47. On observing onion peel slide under low power of compound microscope which set of structures are clearly seen. [0.8]
- a) Nucleus, cell membrane, vacuole, chromosomes b) Cell Wall, vacuole, nucleus, cytoplasm
- c) Cell wall, cell membrane, mitochondria, vacuole d) Cell wall, nucleus, vacuole, chromosomes.
48. Parenchyma cells are [0.8]
- a) doubled walled and specialised b) thick walled and specialised
- c) lignified d) relatively unspecified and thin walled

### Section C

Attempt any 10 questions

**Question No. 49 to 52 are based on the given text. Read the text carefully and answer the questions:**

A solution that has dissolved as much solute as it is capable of dissolving, is said to be a saturated solution. In other words, when no more solute can be dissolved in a solution at a given temperature, it is called a saturated solution. If the amount of solute contained in a solution is less than the saturation level, it is called an unsaturated solution. Chromatography is the technique used for the separation of those solutes that dissolve in the same solvent. The principle is that immiscible liquids separate out in layers depending on their densities. Sublimation is also used to separate substance.



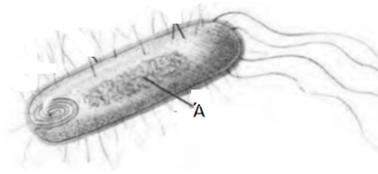
49. The concentration of a solution is expressed by [0.8]
- a) Mass by volume percentage of a solution b) Mass by mass percentage of a solution
- c) Volume by volume percentage of a solution d) All of these

50. Chromatography is used to separate [0.8]
- a) Colours in a dye b) Drugs from the blood  
c) Pigments from natural colours d) All of these
51. Which of the given methods would you use to separate cream from milk? [0.8]
- a) Filtration b) Distillation  
c) Fractional distillation d) Centrifugation
52. The amount of solute present per unit volume or per unit mass of the solution/solvent is known as [0.8]
- a) The concentration of a solvent b) The concentration of a solute  
c) The concentration of a solution d) The composition of the solute

**Question No. 53 to 56 are based on the given text. Read the text carefully and answer the questions:**

Plant cells, in addition to the plasma membrane, have another rigid outer covering called the cell wall. The cell wall lies outside the plasma membrane. The plant cell wall is mainly composed of cellulose. The nucleus has a double-layered covering called a nuclear membrane. The nuclear membrane has pores that allow the transfer of material from inside the nucleus to its outside, that is, to the cytoplasm. The nucleus contains chromosomes, which are visible as rod-shaped structures only when the cell is about to divide. Chromosomes contain information for the inheritance of characters from parents to the next generation in the form of DNA. The nucleus plays a central role in cellular reproduction, the process by which a single cell divides and forms two new cells.

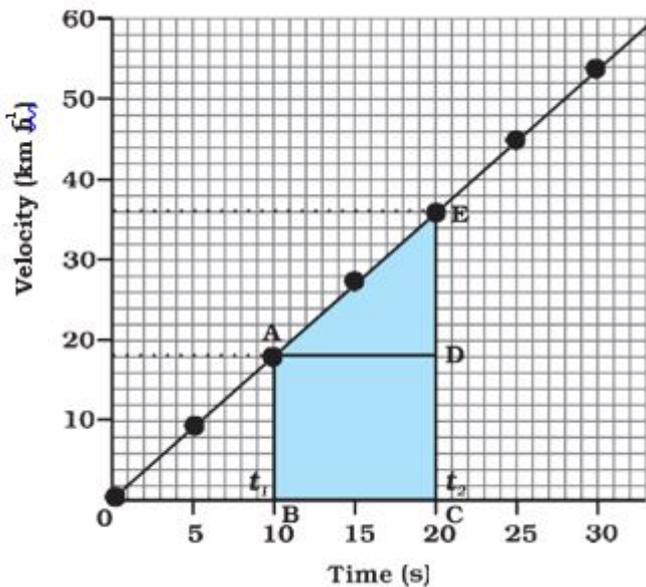
53. Cellulose is a complex substance which provides: [0.8]
- a) both mechanical support and structural strength to plants b) mechanical support  
c) structural strength to plants d) None of these
54. Chromosomes are made up of: [0.8]
- a) Protein b) RNA  
c) DNA d) DNA and protein
55. Plasmolysis in a plant cell is defined as: [0.8]
- I. breakdown (lysis) of the plasma membrane in hypotonic medium  
II. shrinkage of cytoplasm in hypertonic medium  
III. shrinkage of nucleoplasm  
IV. swelling of cytoplasm
- a) (IV) and (I) b) (II) and (III)  
c) (I) and (II) d) Only (II)
56. Identify (A) in the given diagram [0.8]



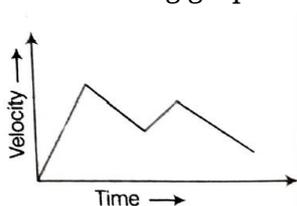
- a) nucleic acid
- b) nucleus
- c) nucleolus
- d) nucleoid

**Question No. 57 to 60 are based on the given text. Read the text carefully and answer the questions:**

In the velocity-time graph for the motion of the car. The nature of the graph shows that velocity changes by equal amounts in equal intervals of time. For all uniformly accelerated motion, the velocity-time graph is a straight line.



57. The slope of a velocity-time graph gives [0.8]
- a) the acceleration
  - b) the speed
  - c) the distance
  - d) the displacement
58. Which of the following statement is correct regarding the velocity and speed of a moving body? [0.8]
- a) The velocity of a moving body is its speed in a given direction.
  - b) The speed of a moving body is always higher than its velocity.
  - c) The velocity of a moving body is always higher than its speed.
  - d) The speed of a moving body is its velocity in a given direction.
59. The following graphs shows: [0.8]



- a) uniformly decelerated motion
- b) uniformly accelerated motion

c) non- uniformly decelerated motion

d) non-uniformly accelerated motion

60. If the displacement of an object is proportional to square of time, then the object moves with:

**[0.8]**

a) uniform velocity

b) uniform acceleration

c) decreasing acceleration

d) increasing acceleration

## Solution

### SUBJECT - SCIENCE - 086 - TEST - 02

#### Class 09 - Science

##### Section A

- (d)** (i), (iii) and (iv)  
**Explanation:** Melting of iron metal, bending of an iron rod and drawing wire of iron metal are all physical changes whereas rusting of iron is a chemical change.
- (c)** it avoids drying of the material  
**Explanation:** Glycerine is used for temporary mounting as it is hygroscopic and does not allow the mounted material to dry up.
- (d)** lateral meristem  
**Explanation:** The lateral meristematic tissues are responsible for an increase in the diameter or girth of the plant.
- (c)** zero displacement  
**Explanation:** When the body comes back to its starting point, it has zero resultant displacements but covers a certain non-zero distance.
- (b)** isolated  
**Explanation:** Force can not generate in a body on its own.
- (c)** a translucent mixture is formed  
**Explanation:** Egg white is translucent. Egg albumin forms colloidal solution which is translucent.
- (b)** both (water only) and (water + inorganic substances)  
**Explanation:** The liquid found inside the plant cell vacuole is referred to as the cell sap and it is a dilute fluid consisting of water, amino acids, glucose i.e. (water + inorganic substances), water may also be inhabited with a negligible amount of salts because it somehow depends on the mineral excess inside the body of plants. The excess material is temporarily stored inside the cell sap. Thus, vacuoles act as storehouses in plants.
- (d)** Chlorenchyma  
**Explanation:** Parenchyma tissues which contain chlorophyll and helps in photosynthesis are called chlorenchyma.
- (b)** (A)  
**Explanation:** Motion can be non-uniform if there is a change in velocity.
- (b)** N - s  
**Explanation:** The Newton second (also newton-second, symbol Ns or N·s) is the derived SI unit of Momentum. It is dimensionally equivalent to the momentum unit kilogram metre per second (kgm/s). One newton second corresponds to a one-newton force applied for one second.  
$$\vec{F} \cdot t = \Delta m\vec{v}$$
- (d)** homogeneous and does not show Tyndall effect  
**Explanation:** Sulphur and carbon disulphide do not form a uniform composition and the properties of the mixture are not same throughout.  
Therefore, it forms a heterogeneous composition.  
Moreover, it shows a Tyndall effect, because in water sulphur remains suspended whereas carbon disulphide settles down as a layer at the bottom.
- (d)** Endocytosis  
**Explanation:** Amoeba acquires its food by the process of endocytosis with the help of finger-like projections called pseudopodia (Pseudo means false; podia means feet). The flexibility of the plasma membrane enables amoeba to use pseudopodia to engulf food and other material from its environment.
- (d)** Connective tissue  
**Explanation:** Two bones can be connected to each other by another type of connective tissue called the

ligament. Tendons connect bones to muscles and are another type of connective tissue.

14. **(b)** Frictional force

**Explanation:** Any object which face non zero force will have some change in speed if the body is at rest or moving. So it is not possible to travel with constant speed. The forces can do work against each other. For example, you could push the object at constant speed over a rough surface. The net force on the object is zero.

15. **(d)** third law of motion

**Explanation:** The jet engine sucks air in at the front with a fan. A compressor raises the pressure of the air. The compressor is made with many blades attached to a shaft. The blades spin at high speed and compress or squeeze the air. The compressed air is then sprayed with fuel and an electric spark lights the mixture. The burning gases expand and blast out through the nozzle, at the back of the engine. As the jets of gas shoot backward, the engine and the aircraft are thrust forward (Newton's third law of motion).

16. **(a)** visible with a powerful microscope

**Explanation:** The size of particles of the colloidal solution lies between  $10^{-7}$  cm to  $10^{-4}$  cm in diameter. So, The particles of colloidal solutions are visible with a powerful microscope.

17. **(c)** porous, double membrane

**Explanation:** The bounding structure of the eukaryotic nucleus. Composed of two phospholipid bilayers with the outer one connected to the endoplasmic reticulum. Double membrane structure riddled with pores that surround deoxyribonucleic acid in eukaryotes. The nuclear pores, like guards at an important government building, are very strict.

18. **(c)** Cartilage

**Explanation:** Cartilage is a connective tissue that provides support and flexibility to the body parts. It smoothens bone surfaces at joints. It is also present in the nose, ear, trachea, and larynx.

19. **(b)** 5:9

**Explanation:** Average speed =  $\frac{500}{10} = 50$  km/hr

Ratio of average speed to maximum speed = 50 : 90 = 5:9

20. **(b)** momentum

**Explanation:**

Momentum remains conserved in absence of any external force. Momentum is the product of the mass and velocity of an object. It is a three-dimensional vector quantity, possessing a magnitude and a direction.

21. **(c)** I<sub>2</sub> solution (Iodine)

**Explanation:** Many different food groups contain a carbohydrate known as starch. Using an iodine solution, you can test for the presence of starch. When starch is present, the iodine changes from brown to blue-black or purple.

22. **(a)** detoxification

**Explanation:** Smooth Endoplasmic Reticulum (SER) is responsible for the synthesis and repair of membranes. It also has a detoxification function.

23. **(b)** phloem fibres

**Explanation:** Phloem fibres are thick walled, elongated spindle shaped dead cells which possess narrow lumen. They provide mechanical support to the tissue. Phloem parenchyma are thin walled-living cells of parenchyma. They have two functions, storage and lateral food conduction.

24. **(a)** constant

**Explanation:** Displacement is proportional to square of time  
s is displacement and t is time then,

$$s \propto t^2$$

$$s = kt^2$$

$$\text{velocity}(v) = 2kt$$

$$\text{Acceleration}(a) = 2k = \text{constant.}$$

So, the motion of the body is constant acceleration.

## Section B

25. **(d) momentum**  
**Explanation:** Rocket works on the conservation of momentum. In a rocket, the fuel burns and produces gas at high temperature. These gases are ejected out of the rocket from a nozzle at the back side of the rocket. The ejecting gas exerts a forward force on the rocket which help in accelerating. Through the mass of gases escaping per second is very small and their momentum is very large due to their tremendous velocity of escape. An equal and opposite momentum is imparted to the rocket which despite its large mass builds up a high velocity.
26. **(b) endoplasmic reticulum**  
**Explanation:** The Golgi apparatus functions as a factory in which proteins received from the Endoplasmic reticulum are further processed and sorted for transport to their eventual destinations: lysosomes, the plasma membrane, or secretion.
27. **(a) Companion cells**  
**Explanation:** Tracheids and vessels are xylem elements and are concerned with the transport of water. They are long tube-like structures with partially or completely dissolved walls to form water pipes (in vessels) and pits in cell wall (in tracheids) for conducting water. Sieve tubes are slender tube-like structures with their end walls perforated by numerous pores and are called sieve plates. They are phloem elements and are main food conducting elements. Companion cells possess numerous mitochondria and ribosomes and are supporting units of sieve tubes.
28. **(b) simple pit pair**  
**Explanation:** The part marked 'X' in the diagram is simple pit pair. In the pair of simple pits of two adjacent cells, each simple pit is more or less uniform-diameter void in the walls. Cell wall contains simple pits. In simple pits the width of the pit chamber is uniform. There is no secondary wall in the simple pit.
29. **(a) Chromosome**  
**Explanation:** An animal cell that does not contain nuclei will also lack chromosomes. Chromosomes are present inside the nucleus of a cell. Chromosomes contain information for the inheritance of features from parents to the next generation in the form of DNA (Deoxyribose Nucleic Acid) molecules.
30. **(b) (A)**  
**Explanation:** If there is a decrease in acceleration, it is called Retardation. This means the rate of decrease in velocity is called Retardation. The negative acceleration is termed retardation or deceleration.  
 SI unit of acceleration (a) is  $\text{m/s}^2$  or  $\text{ms}^{-2}$ .  
 So, the unit of retardation is  $-\text{ms}^{-2}$ .
31. **(b) Both A and R are true but R is not the correct explanation of A.**  
**Explanation:** Both A and R are true but R is not the correct explanation of A.
32. **(c) A is true but R is false.**  
**Explanation:** A fruit when unripe is green but becomes beautifully coloured when ripe. This colour change is due to the change of chloroplasts into chromoplast.
33. **(b) Both A and R are true but R is not the correct explanation of A.**  
**Explanation:** The cells of non-striated muscles or smooth muscles are spindle-shaped, uni-nucleated, elongated, and have no striations. They are involuntary in nature. The non-striated muscles or smooth muscles are found within the walls of the elementary canal, bladder, and blood vessels.
34. **(b) Both A and R are true but R is not the correct explanation of A.**  
**Explanation:** Average velocity  $V_{av}$   

$$= \frac{\text{Total displacement}}{\text{Total elapsed time}} = \frac{Vt}{t} = V$$
 = Instantaneous velocity  
 Hence, assertion is correct. If a particle is in a round trip on a straight line, then average velocity is zero but at the instant at which the particle reverses its direction of motion, velocity is zero. So, reason is correct. But reason is not the correct explanation of assertion.
35. **(c) A is true but R is false.**  
**Explanation:** Plasma membrane makes a boundary around the cell content. If it is ruptured the entire cell

content (cytoplasm, cell organelles) will be lost and cell will die.

36. **(b)** Sulphur will melt first

**Explanation:** When we start heating a mixture of iron filings and sulphur, the sulphur melts reacting exothermically (that is with the production of heat) with the iron filings to form the compound Iron (II) sulfide. The compound formed has properties that are different from both sulfur and iron. For instance, the compound does not have the magnetic properties of iron, and thus a magnet that could have easily separated iron nails and sulphur initially, will not be able to separate iron and sulphur from Iron (II) sulphide.

37. **(b)** the water turned pink

**Explanation:** Metanil yellow is a synthetic dye which is not permitted to use as a food colour. However, it is extensively used to give a yellow colour to dal and turmeric. It is toxic in nature and it has adverse effects on intestine and brain. Presence of metanil yellow can be tested in dal by adding a few drops of hydrochloric acid to test sample. Of the test solution turns pink in colour, it indicates of metanil yellow.

38. **(d)** respiratory tract

**Explanation:** Columnar epithelium in the intestine and columnar epithelium with cilia in the lining of the respiratory tract.

39. **(b)** on different bodies

**Explanation:** Reaction from a body is caused due to action of some another body on it.

40. **(c)** force

**Explanation:** Fireman holds a hose by exerting a force because equal and opposite force acts on him. To counter that force he needs to hold the hose with force.

41. **(d)** Protoplasm

**Explanation:** Protoplasm According to Huxley is the physical basis of life. Inside the cell wall of living cells, the living substance is known as protoplasm and it is a thick fluid or jellylike substance in texture.

42. **(d)** basement membrane

**Explanation:** Epithelial tissues are physically separated from underlying connective tissues by a basement membrane or basal lamina. The portion of an epithelial cell attached to the basement membrane is called its basal surface.

43. **(d)** a cup of tea

**Explanation:** Inertia is directly proportional to mass and one which poses least resistance also possess least inertia.

44. **(a)** chemical method

**Explanation:** The components of compound can be separated by chemical methods only because they have undergone chemical changes while formation which is physically irreversible.

45. **(c)** (i) and (iv)

**Explanation:** A mixture is said to be a homogeneous mixture if its constituents are distributed uniformly and are not physically distinct. Wood and soil are heterogeneous mixtures. Ice is made up of water and water is a pure compound. Air is a mixture of various gases. Ice and air are homogeneous in nature.

46. **(a)** (iii) and (iv)

**Explanation:** Ribosomes are involved in protein synthesis. Enzymes are also proteins. Hence, ribosomes also make enzymes.

47. **(b)** Cell Wall, vacuole, nucleus, cytoplasm

**Explanation:**

- i. There are a large number of regularly shaped cells lying side by side and each cell has a distinct cell wall.
- ii. A distinct nucleus is present on the periphery of each cell.
- iii. A lightly stained cytoplasm is observed in each cell.
- iv. A large vacuole is present at the center of each cell and is surrounded by the cytoplasm.

48. **(d)** relatively unspecified and thin walled  
**Explanation:** Parenchyma cells form the bulk of the plant body. Its cells are living and they possess the power of division. The cells are rounded or isodiametric, i.e., equally expanded on all sides. The cells are oval, round, polygonal or elongated in shape with a thin cell wall. It encloses a dense cytoplasm, which contains small nucleus and surrounds large central vacuole.

### Section C

49. **(d)** All of these  
**Explanation:** All of these
50. **(d)** All of these  
**Explanation:** All of these
51. **(d)** Centrifugation  
**Explanation:** Centrifugation
52. **(c)** The concentration of a solution  
**Explanation:** The concentration of a solution
53. **(c)** structural strength to plants  
**Explanation:** structural strength to plants
54. **(d)** DNA and protein  
**Explanation:** DNA and protein
55. **(d)** Only (II)  
**Explanation:** Only (II)
56. **(d)** nucleoid  
**Explanation:** nucleoid
57. **(a)** the acceleration  
**Explanation:** the acceleration
58. **(a)** The velocity of a moving body is its speed in a given direction.  
**Explanation:** The velocity of a moving body is its speed in a given direction.
59. **(d)** non-uniformly accelerated motion  
**Explanation:** non-uniformly accelerated motion
60. **(b)** uniform acceleration  
**Explanation:** uniform acceleration