CBSE Sample Question Paper Term 1

Class – IX (Session : 2021 - 22)

SUBJECT - SCIENCE - 086 - TEST - 03

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. What happens on adding dilute HCl to a mixture of iron filling and sulphur powder? **[0.8]**

   a. H_2S is formed.

   b. A colourless and odourless gas is formed.

   c. A greenish solution appears.

   d. FeS is formed.

   a) (a), (b) and (c) are correct
   b) (b) and (c) are correct
   c) All of these
   d) (a) and (b) are correct

2. The mineral elements found in our bone making it hard, are **[0.8]**

   a) calcium and phosphorus
   b) sodium and potassium
   c) phosphorus and sodium
   d) sodium and calcium

3. The plant tissue provides mechanical strength and consists of living cells, is **[0.8]**

   a) sclerenchyma
   b) parenchyma
   c) collenchyma
   d) aerenchyma

4. If a body starts from rest, what can be said about the acceleration of the body? **[0.8]**

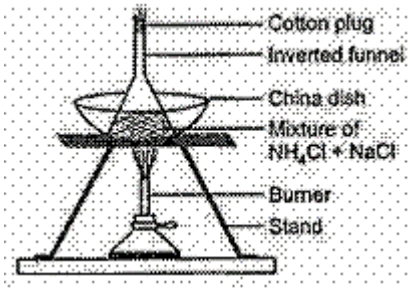
   a) Uniform accelerated
   b) Positively accelerated
   c) Negative accelerated
   d) Non-Uniform accelerated

5. A bullet of mass 10 g is fired from a rifle. The bullet tales 0.003 second to move through its barrel and leaves it with a velocity of 300 m/s. What is the force exerted on the bullet by the rifle? **[0.8]**

   a) 250N
   b) 1000 N

c) 400N d) 200N

6. A mixture of sodium chloride and ammonium chloride is heated in the set-up shown below. **[0.8]**
After the experiment, ammonium chloride will be obtained in the part labelled as:



a) The cotton plug b) The funnel and the China dish

c) Inverted funnel d) China dish

7. Viruses do not show any characteristic of living until they enter a living cell, because of the absence of: **[0.8]**

a) membrane b) mitochondria

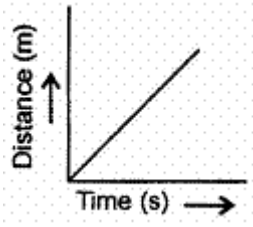
c) nucleic acid d) proteins

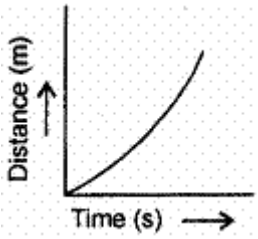
8. Survival of plants in terrestrial environment has been made possible by the presence of **[0.8]**

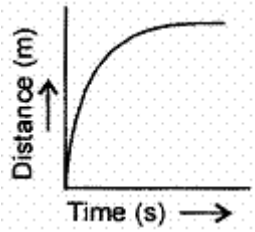
a) conducting tissue b) apical meristem

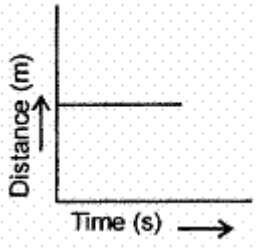
c) parenchymatos tissue d) intercalary meristem

9. Which of the following figures represent uniform motion of moving object correctly? **[0.8]**

a)


b)


c)


d)


10. **Statement A:** Rocket can propel its self in a vacuum. **[0.8]**
Statement B: Newton's laws are universal.
Which of the two statements is true?

a) statement B b) both A and B

c) none of these d) statement A

11. Move magnet over (i) mixture of iron filings and sulphur (ii) over FeS and choose the correct observation **[0.8]**

a) Iron filings are attracted towards the magnet, FeS is not

b) Both (i) and (ii) are not attracted by a magnet

c) Iron filings and FeS both are attracted by a magnet

d) FeS is attracted by magnet whereas iron does not

12. Lysosomes are formed by: **[0.8]**

a) SER

b) Golgi apparatus

c) Plasma membrane

d) RER

13. In desert plants, rate of water loss gets reduced due to the presence of **[0.8]**

a) cuticle

b) stomata

c) suberin

d) lignin

14. Leaves get detached from a tree due to _____. **[0.8]**

a) conservation of momentum

b) change in momentum

c) acceleration

d) inertia

15. Which is correct about frictional force & gravitational force? **[0.8]**

A. Frictional force always produces retardation while gravitational force produces both retardation and acceleration

B. Both produce retardation

C. The frictional force acts when two surfaces are in contact

D. Gravitational force acts when the object is at some height

a) (A) and (B) are correct

b) (B) and (C) are correct

c) (A), (C) and (D) are correct

d) All of these

16. Match the column I with column II and column III: **[0.8]**

	Column I		**Column II**		**Column III**
1	Components can be separated by magnet	i	Suspension	A	Colloidal solution (Aerosol)
2	It can be separated by filtration	ii	Dust particles in air	B	Heterogeneous
3	It shows Tyndall effect	iii	Separating funnel	C	One of the components is soluble in carbon disulphide
4	Mixture of kerosene oil and water	iv	Mixture of iron filings and sulphur powder	D	Immiscible liquids

a) 1. (iv) (C)
2. (i) (B)
3. (ii) (A)
4. (iii) (D)

b) 1. (iv) (A)
2. (i) (C)
3. (ii) (B)
4. (iii) (D)

c) 1. (iv) (C)
2. (i) (B)
3. (ii) (D)
4. (iii) (A)

d) 1. (i) (B)
2. (iv) (C)
3. (iii) (D)
4. (ii) (A)

17. The compounds synthesised near the ER are packaged and dispatched to various sites inside and outside the cell through: **[0.8]**

a) rough endoplasmic reticulum
b) Golgi apparatus
c) plasma membrane
d) smooth endoplasmic reticulum

18. The cells enclosing the stoma are called _____ cells. **[0.8]**

a) cambial
b) guard
c) subsidiary
d) epidermal

19. A body moving with uniform acceleration has velocities 20 ms^{-1} and 30 ms^{-1}. when passing two points A and B. Then the velocity midway between A and B is: **[0.8]**

a) 25.5 ms^{-1}
b) 24 ms^{-1}
c) 25 ms^{-1}
d) $10\sqrt{6}$ ms^{-1}

20. Two bodies of 5 kg and 3 kg moving with velocities 3 m/s and 10 m/s in a straight line with 3 kg behind 5 kg collide. After the collision, 3 kg has a velocity of 5 m/s. The velocity of 5 kg mass is **[0.8]**

a) 10 m/s
b) 6 m/s
c) 9 m/s
d) 3 m/s

21. Conversion of solid directly into its vapour form is called: **[0.8]**

a) evaporation
b) vaporisation
c) distillation
d) sublimation

22. The major function of the Golgi apparatus is: **[0.8]**

a) secretion
b) detoxification
c) fermentation
d) translocation

23. Which of the following sets includes simple permanent tissues? **[0.8]**

a) Collenchyma, parenchyma, Sclerenchyma
b) Pholem, xylem, collenchyma
c) Sclerenchyma, phloem, collenchyma
d) Parenchyma, phloem, sclerenchyma

24. Match the following with the correct response: **[0.8]**

(a) Scalar	(i) Magnitude and direction
(b) Vector	(ii) Motion of satellite
(c) Rectilinear motion	(iii) straight-line motion
(d) Circular motion	(iv) Magnitude

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

Section B

Attempt any 20 questions

25. A force of 5 N gives a mass m_1 an acceleration of $10ms^{-2}$ and mass m_2 an acceleration of 20 ms^{-2}. What acceleration would if give it both the masses were tied together? **[0.8]**

a) $7.65\ ms^{-2}$ b) $7.00\ ms^{-2}$

c) None of these d) $6.67\ ms^{-2}$

26. The functional units of the Golgi apparatus are: **[0.8]**

a) cisternae b) vacuoles

c) vesicles d) cytoplasm

27. Chlorenchyma and aerenchyma are modified/specialised **[0.8]**

a) phloem b) parenchyma

c) sclerenchyma d) collenchyma

28. _____ in the cell wall of cork/bark makes it impervious to water. **[0.8]**

a) Cellulose b) Lignin

c) Suberin d) Pectin

29. Which among the following is concerned with the synthesis and transport of lipids within the cell? **[0.8]**

a) Smooth endoplasmic reticulum b) Lysosomes

c) Rough endoplasmic reticulum d) Golgi apparatus

30. The maximum speed of a train is 90 km/h. It takes 10 hours to cover a distance of 500 km. The ratio of its average speed to maximum speed is: **[0.8]**

a) 9:5 b) 5:9

c) 1: 5 d) 5:1

31. **Assertion (A):** Change in momentum is impulse. **[0.8]**
Reason (R): Impulse is the area between the (F-t) graph and the time axis.

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.

32. **Assertion (A):** Plant cells have very large vacuoles. **[0.8]**
Reason (R): In plant cells, vacuoles are full of cell sap.

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 meristematic cells are compactly arranged and do not contain any intercellular space between them. **[0.8]**
Reason (R): They contain few vacuoles or no vacuoles at all.

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.

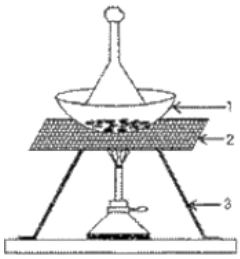
34. **Assertion (A):** The displacement of an object can be either positive, negative or zero. **[0.8]**
Reason (R): Displacement has both the magnitude and direction.

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):** Endoplasmic reticulum acts as an intracellular transport system. **[0.8]**
Reason (R): It transports products of cells to the outside and RNA into the cytoplasm from the nucleus.

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 and R is false.
d) A is false and R is true.

36. In the following diagram, the respective correct labelling of 1, 2 and 3 is **[0.8]**



a) china dish, wire gauze, tripod stand
b) wire gauze, china dish, tripod stand
c) china dish, tripod stand, wire gauze
d) tripod stand, wire gauze, china dish

37. Name the technique to separate camphor from salt. **[0.8]**

a) Centrifugation
b) Sublimation
c) Distillation
d) Crystallisation

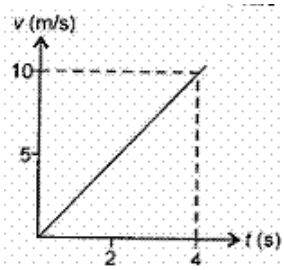
38. The conducting cells of xylem are **[0.8]**

a) tracheids and xylem fibres
b) tracheids and vessels
c) vessels and sieve tubes
d) vessels and xylem fibres

39. A goalkeeper in a game of football pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to **[0.8]**

a) reduce the force exerted by the ball on hands
b) exert larger force on the ball
c) increase the rate of change of momentum
d) decrease the rate of change of momentum

40. The v-t graph of a body of 5 kg moving with the help of a force is shown. Then the force involved is **[0.8]**



a) 12.5 N
b) 2.0 N
c) 20 N
d) 125 N

41. The energy currency of the cell is: **[0.8]**

a) AMP
b) GTP
c) ATP
d) ADP

42. Contractile proteins are present in _____ tissue. **[0.8]**

a) areolar
b) adipose
c) nervous
d) muscular

43. The minimum number of unequal forces that can make zero resultant is **[0.8]**

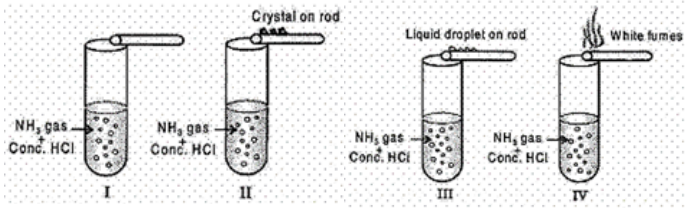
a) ten
b) four
c) three
d) two

44. Out of the following, the only incorrect statement is: **[0.8]**

A. in a colloidal system, the dispersion medium is always in the liquid state.
B. no residue is left on the filter paper when a colloidal solution is filtrated off
C. in a colloidal system dispersion medium is a gas.
D. the colloidal system is a heterogeneous mixture.

a) (C)
b) (A)
c) (D)
d) (B)

45. When a rod dipped in conc. HCl is brought near the mouth of test tube containing ammonia gas: **[0.8]**



The correct observation is

a) III
b) II
c) I
d) IV

46. The site of detoxification in liver cells is: **[0.8]**

a) SER
b) lysosome
c) ribosome
d) RER

47. While doing work and running, you move your organs like hands, legs, etc. Which among the following is correct? **[0.8]**

a) Skeletal muscles contract and pull the tendon to move the bones

b) Smooth muscles contract and pull the ligament to move the bones

c) Skeletal muscles contract and pull the ligament to move the bones

d) Smooth muscles contract and pull the tendons to move the bones

48. Meristematic tissues in plants are **[0.8]**

a) localized and dividing cells

b) localized and permanent

c) not limited to certain regions

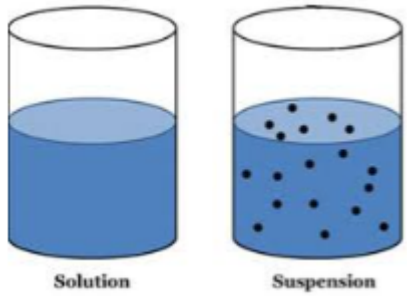
d) growing in volume

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 suspension is a heterogeneous mixture in which the solute particles do not dissolve but remain suspended throughout the bulk of the medium. Particles of a suspension are visible to the naked eye. The particles of a suspension scatter a beam of light passing through it and make its path visible. Due to the relatively smaller size of particles, as compared to that of a suspension, the mixture appears to be homogeneous. The scattering of a beam of light is called the Tyndall effect. The components of a colloidal solution are the dispersed phase and the dispersion medium. The solute-like component or the dispersed particles in a colloid form the dispersed phase, and the component in which the dispersed phase is suspended is known as the dispersing medium.



49. Which of the following is not the property of colloid? **[0.8]**

a) Colloids are big enough to scatter a beam of light passing through it.

b) A colloid is a heterogeneous mixture.

c) Size of particles of a colloid is too small

d) A colloid is very unstable

50. Sol and gel are examples of: **[0.8]**

a) Sol is solid-solid colloid and gel is a solid-liquid colloid

b) Sol is a liquid-solid colloid and gel is a solid-liquid colloid

c) Solid-solid colloids

d) Sol is a solid-liquid colloid and gel is a liquid-solid colloid

51. A mixture of sulphur and carbon disulphide is: **[0.8]**

a) Homogeneous and does not show Tyndall effect

b) Heterogeneous and does not show Tyndall effect

c) Heterogeneous and shows Tyndall effect

d) Homogeneous and shows Tyndall effect

52. Which of the following is an example of solid sol? **[0.8]**

a) Shaving cream

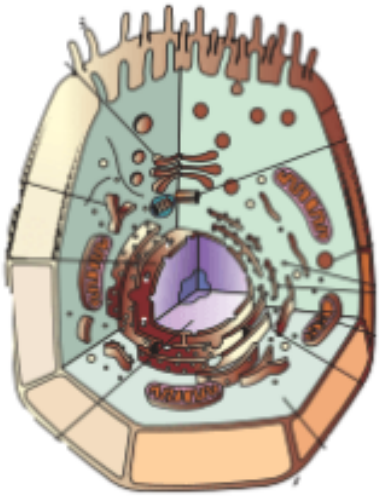
b) Fog

c) Coloured gemstone

d) Milk

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

Cell organelles are enclosed by membranes. Cell organelles are the endoplasmic reticulum, Golgi apparatus, lysosomes, mitochondria and plastids. The endoplasmic reticulum (ER) is a large network of membrane-bound tubes and sheets. It looks like long tubules or round or oblong bags. There are two types of ER rough endoplasmic reticulum (RER) and smooth endoplasmic reticulum (SER). RER looks rough under a microscope because it has particles called ribosomes attached to its surface. The ribosomes, which are present in all active cells, are the sites of protein manufacture. The Golgi apparatus, first described by Camillo Golgi, consists of a system of membrane-bound vesicles arranged approximately parallel to each other in stacks called cisterns.



53. Which of the given are covered by a single membrane? **[0.8]**

a) Plastid

b) Lysosome

c) Vacuole

d) Mitochondria

54. Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell? **[0.8]**

a) Vacuoles

b) Golgi apparatus

c) Lysosomes

d) Smooth endoplasmic reticulum

55. The cell organelle involved in forming complex sugars from simple sugars are: **[0.8]**

a) golgi apparatus

b) ribosomes

c) endoplasmic reticulum

d) plastids

56. Find out the correct sentence about the Endoplasmic reticulum. **[0.8]**

I. Enzymes packed in lysosomes are made through RER.

II. Rough endoplasmic reticulum and smooth endoplasmic reticulum produce lipid and protein respectively.

III. The endoplasmic reticulum is related to the destruction of the plasma membrane.

IV. The SER helps in the manufacture of fat molecules or lipids.

a) (I) and (II)

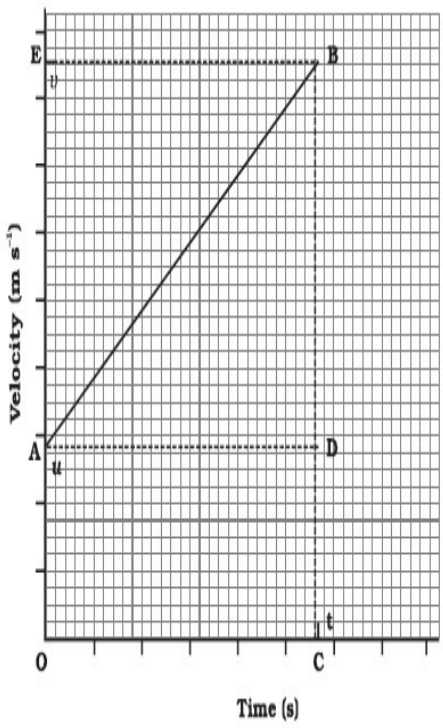
b) (IV) and (I)

c) (III) and (IV)

d) (II) and (III)

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

In the velocity-time graph of an object that moves under uniform acceleration as the initial velocity of the object is u (at point A) and then it increases to v (at point B) in time t. The velocity changes at a uniform rate a.



57. A boy goes from A to B with a velocity of 20 m/min and comes back from B to A with a velocity of 30 m/min. The average velocity of the boy during the whole journey is **[0.8]**

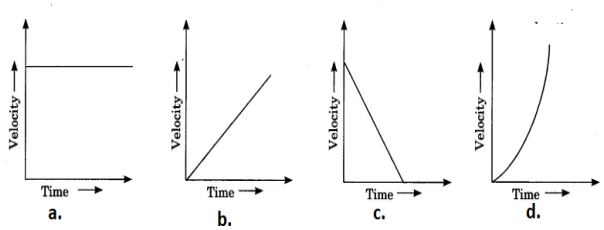
a) 20 m/min

b) Zero

c) 24 m/min

d) 25 m/s

58. A car is moving along a straight road with uniform velocity. It is shown in the graph. **[0.8]**



a) a

b) d

c) c

d) b

59. The ratio of speed to the magnitude of velocity when the body is moving in one direction is **[0.8]**

a) equal to one

b) greater than or equal to one

c) less than one

d) greater than one

60. Which of the following statement is correct with respect to the velocity-time graph given above? **[0.8]**

I. the perpendicular lines BC and BE are drawn from point B on the time

II. initial velocity is represented by OA

III. the final velocity is represented by OC

IV. the time interval t is represented by OB.

a) (III) and (IV)

b) (II) and (III)

c) (IV) and (I)

d) (I) and (II)

Solution

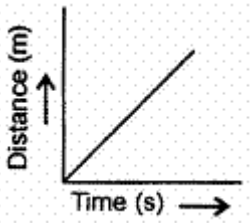
SUBJECT - SCIENCE - 086 - TEST - 03

Class 09 - Science

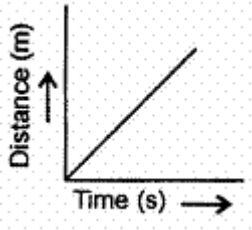
Section A

1. **(b)** (b) and (c) are correct
   Explanation: Fe(s) + 2HCl(aq) → $FeCl_2$(aq) + H_2(g)
   Sulfur will not react with HCl and it will not conduct electricity.
   $FeCl_2$ is a Pale blue-green. And H_2 is a colourless and odourless gas.
   So, Statement B and C are the correct statements.
2. **(a)** calcium and phosphorus
   Explanation: Bone cells are embedded in a hard matrix, which is strengthened by fibers, and hardened by calcium and phosphorus salts. The matrix is deposited in the form of concentric layers of lamellae formed around a central Haversian canal.
3. **(c)** collenchyma
   Explanation: Collenchyma cells are refractile, non lignified, living cells with pectocellulose thickening in specific areas of walls, and without intercellular spaces. It provides mechanical strength with flexibility thus allows bending. Besides, it shows growth and elongation of organs, photosynthesize, and stores food and prevents tearing of leaves.
4. **(b)** Positively accelerated
   Explanation: If a body starts from rest, it starts moving. that means the change in velocity is positive. That means there is a **POSITIVE** acceleration.
5. **(b)** 1000 N
   Explanation: Mass of bullet = 10 g = $\frac{10}{1000}$ kg.
   initial velocity (u) = 0 and final velocity (v) = 300 m/s.
   time (t) = 0.003 s
   F= $\frac{(mv-mu)}{t}$
   = $\frac{(0.1\times300-0.01\times0)}{0.003}$
   = $\frac{(3-0)}{0.003}$
   = $\frac{3}{0.003}$
   = 1000 N
6. **(c)** Inverted funnel
   Explanation: Solid NH_4Cl will be formed on the sides of inverted funnel. On heating it gets converted into vapours. And the vapours are not able to escape due to the cotton plug at its end. So the condensed vapours are seen on funnel tube.
7. **(a)** membrane
   Explanation: Viruses are only crystalline genetic materials in the form of RNA and DNA. They lack any membrane. After getting incorporated in the host DNA they become functional otherwise remain inactive.
8. **(a)** conducting tissue
   Explanation: The conducting tissues in plants conduct different saps and have different structures. The primary conducting tissues of plants are xylem and phloem. Xylem conducts water from roots to the other parts of the plant, whereas phloem transports food and other material from the leaves to other parts of plants.

9. **(a)**



Explanation: Uniform motion of a moving object



10. **(b)** both A and B
Explanation: The rocket moves forward according to newton's third law of motion. The gas and other substance coming out from the tail push the rocket in the forward direction. Newton's laws are universal.
11. **(a)** Iron filings are attracted towards the magnet, FeS is not
Explanation: Move magnet over a mixture of iron filings and sulphur Iron filings are attracted to the magnet but sulfur is not. This proves that the mixture is not yet a compound, and is a mixture, as it can be separated by physical means.
Compound FeS is not attracted by a magnet.
12. **(b)** Golgi apparatus
Explanation: Lysosomes are manufactured and budded into the cytoplasm by the Golgi apparatus with hydrolytic enzymes inside. The enzymes that are within the lysosome are made in the rough endoplasmic reticulum, which are then delivered to the Golgi apparatus to synthesise lysosomes.
13. **(a)** cuticle
Explanation: Cuticle are protective, hydrophobic waxy covering produced by epidermal cells of leaves, young shoots and other aerial parts. It minimises the water loss through transpiration (with the help of stomata) and also reduces pathogen entry.
14. **(d)** inertia
Explanation: Leaves remain at rest and the branch changes its place as a result leaves break off.
15. **(c)** (A), (C) and (D) are correct
Explanation: Statement (B) is wrong as when you drop a ball from a height gravity provides acceleration. Also, the frictional force is a retarding force while gravitational force may be retarding or accelerating. The frictional force is a contact force whereas gravitational force acts from distance like from height.
16. **(a)**
    1. (iv) (C)
    2. (i) (B)
    3. (ii) (A)
    4. (iii) (D)

Explanation:

- A mixture of iron filings and sulphur powder can be separated by using a magnet. Addition of carbon disulphide to a mixture containing iron filings and sulphur powder leads to the formation of a clear yellow solution when sulphur powder dissolves in carbon disulphide, on gentle shaking.
- A suspension is a heterogeneous mixture in which the solute particles do not dissolve but remain suspended throughout the bulk of the medium. Filtration is used to separate a substance from a mixture because one is insoluble in the solvent and the other is soluble. The separation is due to particle size.
- Tyndall effect is shown by colloids. Air is a mixture of gases. Clean air doesn't show Tyndall effect. Smoky or foggy air, however, shows Tyndall effect, because the light passing through such a colloidal

solution will be reflected by the larger particles making the light beam visible. The aerosol is a subset to colloids, which contains a fine particle of liquid or solid dispersed evenly in gas phase show Tyndall effect.

- The mixture of kerosene oil and water can be separated by separating funnel. The mixture of kerosene oil and water are immiscible liquids.

17. **(b)** Golgi apparatus
Explanation: Golgi apparatus is an organelle present in most eukaryotic cells. It is made up of membrane-bound sacs and transport molecules from the endoplasmic reticulum to different locations.

18. **(b)** guard
Explanation: Each stoma is bounded by a pair of specialized epidermal cells or two kidney-shaped cells called guard cells. The concave sides of these guard cells face each other and have a space forming the stomatal opening. A stoma is composed of two guard cells that regulate the opening and closing of the stoma.

19. **(a)** 25.5 ms^{-1}
Explanation: Let the acceleration of the car is = a
And the distance between A and B is = d
$v^2 - u^2 = 2ad$
v = 30m/s and u = 20m/s
$2ad = 30^2 - 20^2$
$Ad = \frac{(900-400)}{2} = 250$
When the car is at the mid point of AB then let the speed of the car is v_1
$v_1^2 - 20^2 = 2a\ (\frac{d}{2})$
$v_1^2 = ad + 400 = 250 + 400 = 650$
therefore v_1 is = 25.4950m/s.

20. **(b)** 6 m/s
Explanation: If $v_2 = x$
Since momentum must be conserved, so,
$m_1u_1 + m_2u_2 = m1v1 + m_2v_2$
$5 \times 3 + 3 \times 10 = 3 \times 5 + 5 \times X$
$15 + 30 = 15 + 5X$
$5X = 45\text{-}15 = 30$
$X = \frac{30}{5} = 6\ m/s$

21. **(d)** sublimation
Explanation: Sublimation is the phase transition of a substance directly from the solid to the gas phase without passing through the intermediate liquid phase.

22. **(a)** secretion
Explanation: The Golgi apparatus is the organelle in which proteins are prepared for secretion and undergo terminal glycosylation.

23. **(a)** Collenchyma, parenchyma, Sclerenchyma
Explanation: Two simple permanent tissue in plants are parenchyma and collenchyma while two complex permanent tissue in plants are xylem and phloem. Sclerenchyma tissue is dead simple permanent tissue of the plant.

24. **(c)** (a) - (iv), (b) - (i),(c) - (iii), (d) - (ii)
Explanation:

i. A physical quantity having only magnitude is known as a scalar quantity. A scalar quantity has no direction.
ii. A physical quantity having magnitude as well as direction is known as a vector quantity.
iii. Artificial satellites move under uniform circular motion around the earth. An artificial satellite goes around the earth in a circular orbit.

iv. Rectilinear motion is another name for straight-line motion. This type of motion describes the movement of a particle or a body.

Section B

25. **(d)** 6.67 ms^{-2}
Explanation: $m_1 = \frac{5N}{10ms^{-2}}$ = 0.5 kg, $m_2 = \frac{5N}{20ms^{-2}}$ = 0.25 kg
Total mass = 0.5 + 0.25 = 0.75 kg.
Acceleration produced when both masses are tied together = $\frac{5N}{0.75kg}$ kg
= 6.67 ms^{-2}.

26. **(a)** cisternae
Explanation: Golgi apparatus is a membrane-bound organelle of eukaryotic cells (cells with clearly defined nuclei) that is made up of a series of flattened, stacked pouches called cisternae. The Golgi apparatus is responsible for transporting, modifying, and packaging proteins and lipids into vesicles for delivery to targeted destinations.

27. **(b)** parenchyma
Explanation: Parenchyma cells containing chloroplasts are collectively termed as chlorenchyma. Special parenchyma tissue is found in the aquatic plants and some land plants (e.g., petiole of Banana, Canna). It is known as aerenchyma. It consists of a network of parenchyma cells that enclose very large air cavities.

28. **(c)** Suberin
Explanation: The cork is impervious to water due to suberin deposition in the cell wall of its cells. The walls of cork cells are heavily thickened with an organic substance, suberin. Suberin makes these cells impervious to water and gases.

29. **(a)** Smooth endoplasmic reticulum
Explanation: Smooth endoplasmic reticulum synthesises lipids while rough endoplasmic reticulum synthesise proteins.

30. **(b)** 5:9
Explanation: Average speed = $\frac{500}{10}$ = 50 km/hr
Ratio of average speed to maximum speed = 50 : 90 = 5:9

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. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: Plant cells possess large vacuoles to perform functions like:
i. Storage of water, mineral etc.
ii. Provide turgidity and rigidity to the cell, as it is filled with cell sap.

33. **(b)** Both A and R are true but R is not the correct explanation of A.
Explanation: The characteristics of meristematic tissues include that the meristematic cells are compactly arranged and do not contain any intercellular space between them. They contain few vacuoles or no vacuoles at all. Hence, both the statements are true but the reason is not correct statement for the assertion.

34. **(b)** Both A and R are true but R is not the correct explanation of A.
Explanation: Displacement may be positive, negative or zero. Displacement is a vector quantity.

35. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: The function of endoplasmic reticulum is to help in intra cellular transport.

36. **(a)** china dish, wire gauze, tripod stand
Explanation: In the above given figure: 1 - is a china dish, 2 - is a wire gauze and 3 - is a tripod stand.

37. **(b)** Sublimation
Explanation: The process of sublimation will help in separating camphor from salt. Camphor is a sublimating substance and on heating it converts directly into gases.

38. **(b)** tracheids and vessels
Explanation: There are two types of conducting cells in xylem, tracheids and vessel elements. Both have

thick lignified secondary walls and are dead at maturity. These cells create hollow cylinders that have high tensile strength. Materials moving within the xylem are under tension.

39. **(d)** decrease the rate of change of momentum
Explanation: The goalkeeper pulls his hands backwards after holding the ball to decrease the rate of change of momentum by increasing the time. By doing this, less force is exerted on his hands (v Force is directly proportional to the rate of change of momentum).

40. **(a)** 12.5 N
Explanation: $F = \frac{m \times v}{t} = \frac{5 \times 10}{4} = \frac{50}{4} = 12.5\ N$

41. **(c)** ATP
Explanation: Adenosine triphosphate (ATP) is called as the energy currency of the cell. The energy produced by a cell during internal respiration is stored in the form of ATP molecules. ATP breaks into ADP and phosphate to produce energy during cellular processes.

42. **(d)** muscular
Explanation: Contractile proteins are found in muscles, as they are associated with the movement of the body or limbs. The contraction and relaxation of contractile proteins, present in muscles bring about movements of limbs, internal organs, etc.

43. **(c)** three
Explanation: If two unequal forces are taken then given two vectors of unequal length, adding them will result in a non-zero vector because, in order to have a zero vector sum, the first and second vectors must "cancel out." For example, if you travel left 1 metre you must travel 1 metre right to return to your initial position. So, 3 unequal forces are mandatory for making resultant force zero.

44. **(b)** (A)
Explanation: Colloidal system or colloidal dispersion is a heterogeneous system that is made up of the Dispersed phase and the Dispersion medium. In colloidal dispersion, one substance is dispersed as very fine particles in another substance called dispersion medium. The dispersed phase and dispersion medium can be solid, liquid, or gas. Depending upon the state of the dispersed phase and dispersion medium. So the given statement is incorrect.

45. **(d)** IV
Explanation: White fumes of Ammonium chloride(NH_4Cl) will be formed.

46. **(a)** SER
Explanation: SER i.e. the smooth endoplasmic reticulum lacks ribosomes and functions in lipid manufacture and metabolism, the production of steroid hormones, and detoxification.

47. **(a)** Skeletal muscles contract and pull the tendon to move the bones
Explanation: Skeletal muscles are striped, voluntary muscles, due to the presence of alternate dark and light bands. They are called voluntary as they work according to our will. While doing work and running skeletal muscles contract and pull the tendon (which connects muscles to bones) to move the bone.

48. **(a)** localized and dividing cells
Explanation: Meristematic tissues consists of actively dividing cells and is present in the growing regions of plants, e.g., the tips of roots and stems. The cells of meristematic tissue are round, oval, polygonal or rectangular. They are packed closely without intercellular spaces, have thin cellulose walls, dense cytoplasm and prominent nuclei. Vacuoles are almost absent in such cells because they are completely filled with sap.

Section C

49. **(d)** A colloid is very unstable
Explanation: A colloid is very unstable

50. **(d)** Sol is a solid-liquid colloid and gel is a liquid-solid colloid
Explanation: Sol is a solid-liquid colloid and gel is a liquid-solid colloid

51. **(a)** Homogeneous and does not show Tyndall effect
Explanation: Homogeneous and does not show Tyndall effect

52. **(c)** Coloured gemstone
Explanation: Coloured gemstone

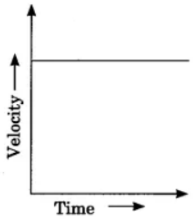
53. **(c)** Vacuole
Explanation: Vacuole

54. **(d)** Smooth endoplasmic reticulum
Explanation: Smooth endoplasmic reticulum

55. **(a)** golgi apparatus
Explanation: golgi apparatus

56. **(b)** (IV) and (I)
Explanation: (IV) and (I)

57. **(c)** 24 m/min
Explanation: 24 m/min

58. **(a)** a
Explanation: 

59. **(a)** equal to one
Explanation: equal to one

60. **(d)** (I) and (II)
Explanation: (I) and (II)