CBSE Sample Question Paper Term 1

Class – IX (Session : 2021 - 22)

SUBJECT - SCIENCE - 086 - TEST - 01

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

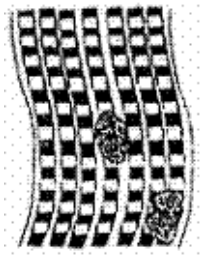
1. The process of evaporation is fast when the mixture is: **[0.8]**

   a) heated but covered
   b) heated but not covered
   c) covered but not heated
   d) neither heated nor covered

2. Lignified or thickened cell wall is a characteristic feature of **[0.8]**

   a) phloem
   b) xylem
   c) parenchyma
   d) collenchyma

3. A student identified the following figure as stripped muscles because of: **[0.8]**



   a) has no striations and is uninucleated
   b) light and dark striations and is uninucleated
   c) has no striations and is multinucleated
   d) light and dark striations and is multinucleated

4. Two cars A and B race each other. The Car A ran for 2 min at a speed of 7.5 km/h, slept for 56 min and again ran for 2 min at a speed of 7.5 km/h. The average speed of the car A in the race is: **[0.8]**

   a) 10 km/hr
   b) 5 km/hr

c) 0.5 km/hr

d) 50 km/hr

5. A man is at rest in the middle of the pond on perfectly smooth ice. He can get himself to the shore by making use of Newton's: **[0.8]**

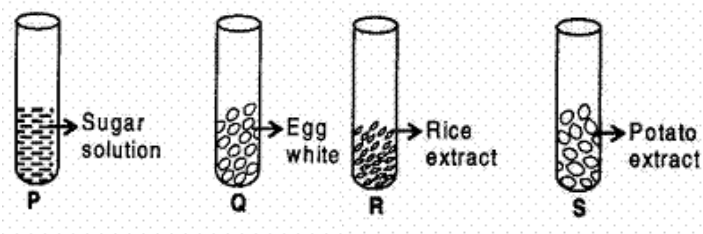
a) Third law of motion

b) Fourth

c) First

d) Second

6. Four test P, Q, R, S shown below contain the following: **[0.8]**



On adding 2 drops of iodine to each tube, which will show blue-black solution

a) Q and R

b) R and S

c) P, Q, R and S

d) P and Q

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

(a) Robert Brown	(i) Cell
(b) Purkinje	(ii) Nucleus
(c) Robert Hooke	(iii) Cell theory
(d) Schleiden	(iv) Protoplasm

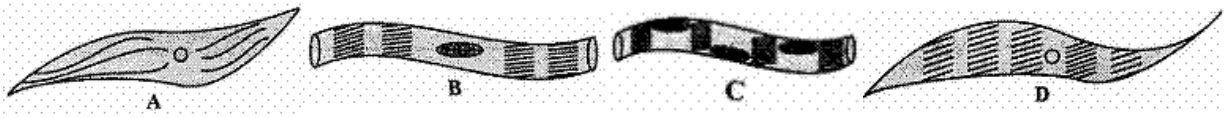
a) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

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)

8. Out of the following, the correct diagram of the stripped muscle fibre, is the diagram labelled as: **[0.8]**



a) D

b) B

c) C

d) A

9. A car travels 10 m in 5 seconds, 20 m in the next 10 seconds, and 30 m in the last 10 seconds. The average speed of the motion is: **[0.8]**

a) $30\ ms^{-1}$

b) $2.2\ ms^{-1}$

c) $2.4\ ms^{-1}$

d) $2.0\ ms^{-1}$

10. The inertia of an object tends to cause the object **[0.8]**

a) to decelerate due to friction

b) to increase its speed

c) to resists any change in its state of motion

d) to decrease its speed

11. What is the order of methods applied to separate the components of a mixture of salt, sand, **[0.8]**

and ammonium chloride?

a) Sublimation, dissolving in water, filtration and evaporation

b) Dissolving in water, evaporation, and sublimation

c) Moving a magnet, dissolving in water and sublimation

d) Dissolving in water, filtration, evaporation, and sublimation

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

(a) Genes	(i) Gases
(b) Diffusion	(ii) Loss of water by plant cells
(c) Osmosis	(iii) Movement of water molecular
(d) Plasmolysis	(iv) Hereditary units

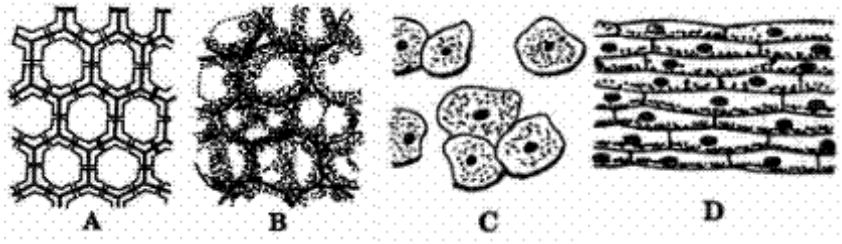
a) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

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

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

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

13. Identify the tissues in given diagrams and choose the correct sequence **[0.8]**



a) A : Sclerenchyma, B : Parenchyma, C : Cheek cells, D : Onion Peel

b) A : Sclerenchyma, B : Parenchyma, C : Onion peel, D : Cheek cells

c) A : Parenchyma, B : Sclerenchyma, C : Cheek cells, D : Onion peel

d) A : Parenchyma, B : Sclerenchyma, C : Onion peel, D : Cheek cells

14. **Statement A:** A passenger falls forward when a bus suddenly starts moving in the forward direction. **[0.8]**

Statement B: A gun recoils backward with a small speed than the bullet moving forward.

Which of the following statements is/are true?

a) neither statement A nor Statement B is true

b) statement B is true

c) both statements A and B are true

d) statement A is true

15. While catching a stone thrown by your friend you pull the hands back to **[0.8]**

a) avoid the breaking of the stone

b) avoid getting hurt

c) increase the time to slow down

d) decrease the time to slow down

16. Which of the following would show positive test for the presence of starch? **[0.8]**

a) Bread

b) Milk

c) Coriander

d) Cauliflower

17. Membrane-bound cell organelles are not found in _____ cells. **[0.8]**

a) Fungal
b) Eukaryotic
c) Prokaryotic
d) Amoeba

18. The number of cellular layers keeps on changing in **[0.8]**

a) stratified epithelium
b) simple squamous epithelium
c) both simple and stratified epithelium
d) glandular epithelium

19. Find the correct statement: **[0.8]**

A. The SI unit of retardation is $-ms^{-2}$
B. The motion of the athletes is uniform
C. Displacement is a scalar quantity
D. Velocity has magnitude only

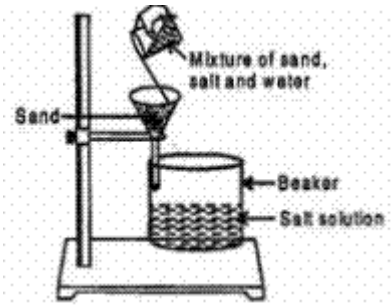
a) (B)
b) (A)
c) (D)
d) (C)

20. A gun recoiled to _____ the momentum. **[0.8]**

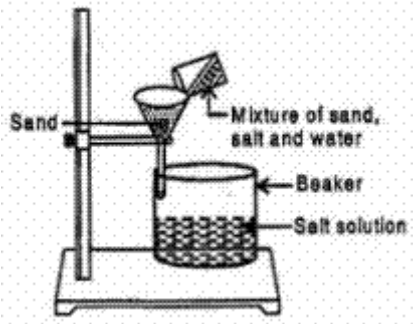
a) decrease
b) conserve
c) increase
d) change

21. Four students were asked to separate sand from a mixture of sand and salt by using water to dissolve the salt in it and then filtering the mixture. The teacher provided them with a funnel, filter paper, beaker, glass stick and stand. Students have set-up apparatus as shown in options. The teacher stopped three of them for using the wrong procedure. The correct way of separating the mixture is that in the set-up **[0.8]**

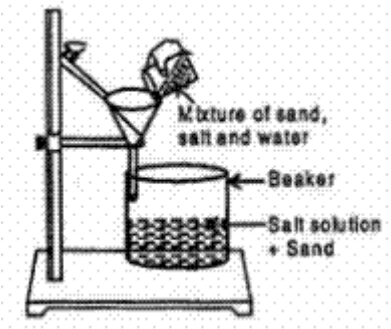
a)



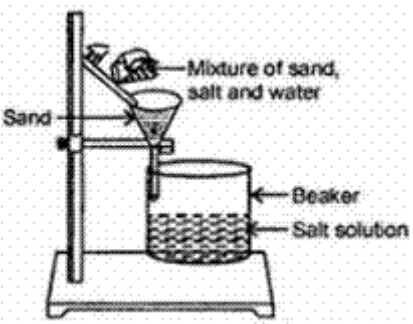
b)



c)



d)



22. Which of these is not related to endoplasmic reticulum? **[0.8]**

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

cytoplasm.

23. Smooth muscle fibres are: **[0.8]**

a) cylindrical, striated unbranched, multinucleate and voluntary

b) cylindrical, unbranched, unstriated uninucleate and involuntary

c) cylindrical, striated unbranched, non-striated, multinucleate and involuntary

d) spindle shaped, unbranched, non-striated, multinucleate and involuntary

24. What does the slope of the position-time graph indicate? **[0.8]**

a) Speed

b) Speed or velocity

c) Acceleration

d) Velocity

Section B

Attempt any 20 questions

25. A plate, a ball and child all have the same mass. The one having more inertia is the **[0.8]**

a) child

b) plate

c) All have equal inertia

d) ball

26. Which of the following can be made into crystal? **[0.8]**

a) An Amoeba

b) A Bacterium

c) A Virus

d) A Sperm

27. Which of the following helps in repair of tissue and fills up the space inside the organ? **[0.8]**

a) Tendon

b) Cartilage

c) Areolar

d) Adipose tissue

28. Which muscles act involuntarily? **[0.8]**

i. Striated muscles
ii. Smooth muscles
iii. Cardiac muscles
iv. Skeletal muslces

a) (i) and (ii)

b) (i) and (iv)

c) (iii) and (iv)

d) (ii) and (iii)

29. If a plant cell is kept in a hypotonic solution, it will: **[0.8]**

a) increase in its volume

b) the decrease in its volume

c) burst

d) maintain the same volume

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

(a) Rate of change of velocity	(i) Uniform circular motion
(b) Rate of change of displacement	(ii) Velocity
(c) Rate of change of distance	(iii) Acceleration
(d) Rate of change of speed in a circular path	(iv) Speed

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

31. **Assertion (A):** The third law of motion states that when one object exerts a force on another object, the second object instantaneously exerts a force back on the first. **[0.8]**
Reason (R): The two forces are always equal in magnitude but opposite in 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.

32. **Assertion (A):** A plant cell bursts if placed in water. **[0.8]**
Reason (R): High turgor pressure causes bursting of plant cells.

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):** Most of plant tissues are dead. **[0.8]**
Reason (R): Due to the sedentary existence of plants, dead cells provide mechanical strength more easily than live ones and need less maintenance.

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 speed or velocity of a car running on a crowded city, road changes continuously. **[0.8]**
Reason (R): The movement of a car on a crowded city road is an example of non-uniform acceleration.

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):** A cell swells up when present in a hypotonic solution. **[0.8]**
Reason (R): More water molecules enter the cell than they leave.

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. When you add carbon disulphide in a test tube containing a mixture of iron fillings and sulphur powder, then what would you observe after shaking the test tube well? **[0.8]**

a) After sometimes, carbon disulphide, sulphur and iron filings form three separate layers in the test-tube
b) Some brown gas is evolved
c) Sulphur dissolves to from colourless solution and iron filings settles down
d) Yellow solution is formed and iron filings settles down.

37. Which one of the following will form a translucent solution in water? **[0.8]**

a) Soil
b) Sand
c) Starch
d) Sugar

38. Most of the metabolic functions of plants are carried out by **[0.8]**

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

39. Match the following with correct response. **[0.8]**

(1) Newton's first law of motion	(A) The acceleration produced is directly proportional to the product of mass & force applied
(2) Newton's second law of motion	(B) When no force is exerted on an object it stays at rest or it moves in a straight light with constant speed
(3) Newton's third law of motion	(C) To every action, there is an equal & opposite reaction
(4) Galileo's law of inertia	(D) An object at rest or in uniform motion will remain at rest or uniform motion unless an unbalanced force is applied on it

a) 1-A, 2-C, 3-B, 4-D
b) 1-D, 2-A, 3-C, 4-B
c) 1-B, 2-D, 3-A, 4-C
d) 1-C, 2-B, 3-D, 4-A

40. Impulse has the S.I. unit of _____ **[0.8]**

a) newton
b) N-s
c) joule
d) m/s^2

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

a) Endoplasmic reticulum
b) Plastids
c) Golgi apparatus
d) Ribosomes

42. Bones are connected to muscles at the joints by **[0.8]**

a) tendon
b) adipose tissue
c) areolar tissue
d) Ligament

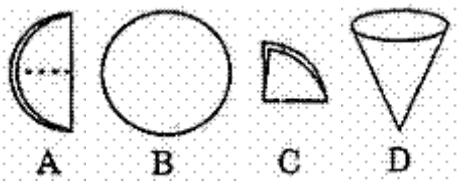
43. Newton's first law gives the _____ definition of force. **[0.8]**

a) quality
b) quantitative
c) qualitative
d) None of these

44. To prepare iron sulphide, by heating a mixture of iron filings and sulphur powder, we should use a: **[0.8]**

a) copper dish
b) china dish
c) watch glass
d) petri dish

45. Which of the following is correct sequence of following of filter paper? **[0.8]**



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

46. Lysosomes are the reservoirs of: **[0.8]**

a) steroid hormones
b) glycogen
c) digestive enzymes
d) oxidising enzymes

47. The water conducting tissue generally present in gymnosperm is **[0.8]**

a) xylem fibres
b) tracheids
c) sieve tube
d) vessels

48. Which of the following components are seen in a slide of human cheek cell when observed under a microscope? **[0.8]**

a) Cell wall, cytoplasm, nucleus
b) Cell membrane, protoplasm, nucleus
c) Cell membrane, cytoplasm, nucleus
d) Cell wall, protoplasm, nucleus

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:

Air is a homogeneous mixture and can be separated into its components by fractional distillation. The air is compressed by increasing the pressure and is then cooled by decreasing the temperature to get liquid air. This liquid air is allowed to warm-up slowly in a fractional distillation column, where gases get separated at different heights depending upon their boiling points. The properties that can be observed and specified like colour, hardness, rigidity, etc. are the physical properties. The interconversion of states is a physical change because these changes occur without a change in composition and no change in the chemical nature of the substance.

49. Which of the following are chemical changes? **[0.8]**

I. Decaying of wood
II. Burning of wood
III. Sawing of wood
IV. Hammering of a nail into a piece of wood

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

50. The boiling point of oxygen is **[0.8]**

a) -130°C
b) -180°C
c) -180°C
d) -170°C

51. _____ is a process that separates a pure solid in the form of its crystals from a solution. **[0.8]**

a) Crystallisation
b) None of these
c) Distillation
d) Simple evaporation

52. Which of the given 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), (III) and (IV)
b) (II), (III) and (IV)
c) (I), (II) and (III)
d) (I), (II) and (IV)

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

Leeuwenhoek discovered the free-living cells in pond water for the first time. Robert Brown discovered the nucleus in the cell. A single cell may constitute a whole organism as in Amoeba. These organisms are called unicellular organisms. On the other hand, many cells group together in a single body and assume different functions in it to form various body parts in multicellular organisms. The shape and size of cells are related to the specific function they perform. Each living cell has the capacity to perform certain basic functions that are characteristic of all living forms. Each kind of cell organelle performs a special function, such as making new material in the cell, clearing up the waste material from the cell and so on.

53. Cells were first discovered by: **[0.8]**

a) Leeuwenhoek
b) Virchow
c) Robert Hooke
d) Schleiden

54. Which of the following is a unicellular organism? **[0.8]**

a) Plants
b) Fungi
c) Animal
d) Chlamydomonas

55. Who suggested that all cells arise from pre-existing cells? **[0.8]**

a) Leeuwenhoek
b) Schleiden
c) Robert Hooke
d) Virchow

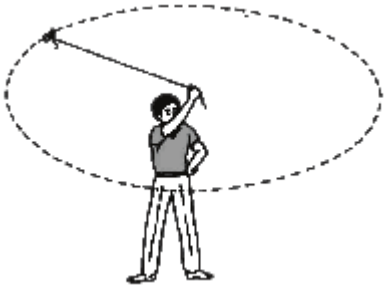
56. Which of the following is an incorrect statement? **[0.8]**

I. Each living cell has the capacity to perform certain basic functions
II. There is a division of labour in multicellular organisms
III. Each kind of cell organelle performs a special function
IV. All activities inside the cell do not interact with the environment.

a) (II) and (III)
b) (I) and (II)
c) (III) and (IV)
d) Only (IV)

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

When an object moves in a circular path with uniform speed, its motion is called uniform circular motion. The direction of motion changed at every point moving along the circular path.



57. Which one of the following is most likely not a case of uniform circular motion? **[0.8]**

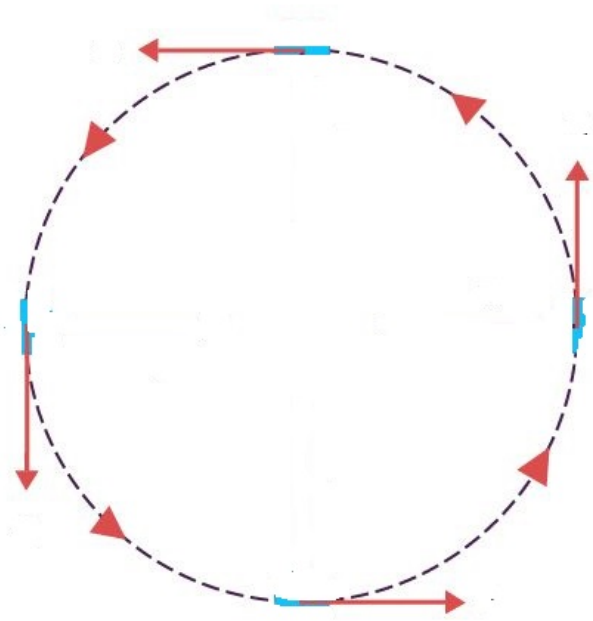
a) The motion of hours' hand on the dial of a clock.

b) The motion of a racing car on a circular track.

c) The motion of the earth around the sun.

d) The motion of a toy train on a circular track.

58. The train is moving on a track**(below image)**. Though the speed of a train is constant the direction of motion (or direction of speed) is changing continuously. So, the train is exhibiting: **[0.8]**



a) uniform motion

b) uniform notion

c) decelerated motion

d) accelerated motion

59. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed. **[0.8]**

a) 5.8 m/s

b) 5.6 m/s

c) 5.5 m/s

d) 5.7 m/s

60. Which of the following statement is correct? **[0.8]**

I. Motion of the moon and the earth is an example of non-uniform circular motion.
II. When the velocity of an object changes, we say that the object is accelerating.
III. A satellite in a straight orbit around the earth.
IV. the change in the velocity could be due to a change in its magnitude or the direction of the motion or both.

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

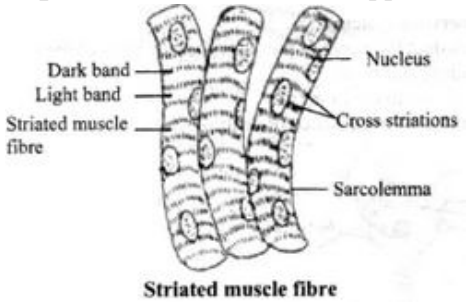
Solution

SUBJECT - SCIENCE - 086 - TEST - 01

Class 09 - Science

Section A

1. **(b)** heated but not covered
   Explanation: Evaporation is a type of vaporization, that occurs on the surface of a liquid as it changes into the gaseous phase. When heating is done and the mixture is not covered at that time evaporation is fast.
2. **(b)** xylem
   Explanation: The xylem is one of the conductive tissues in plants. It is a complex tissue composed of many types of cells. The main function of xylem is to conduct water and minerals from roots to leaves. The secondary xylem also provides mechanical support due to the presence of a thick lignified cell wall.
3. **(d)** light and dark striations and is multinucleated
   Explanation: Striated muscle cells are cylindrical, elongated and enclosed in a membrane called sarcolemma.
   Striated muscles cells are multinucleated.
   Striated muscles show presence of light and dark bands which gives it striped appearance.
4. **(c)** 0.5 km/hr
   Explanation: Distance = speed $\times$ time
   Distance travelled in first 2 min = $7.5 \times \frac{2}{60}$ = 0.25 km
   Distance travelled in last 2 min = $7.5 \times \frac{2}{60}$ = 0.25 km
   Total distance = 0.25 + 0.25 = 0.5 km
   Total time = 2 + 2 + 56 = 60 min = 1 hr
   Average speed = $\frac{0.5}{1}$
   = 0.5 km/hr
5. **(a)** Third law of motion
   Explanation: By using Newton's third law of motion, he can get himself to shore. When the person pushes forward, the reaction force offered by the ice is very little. But, this reaction force will help him to move forward. Hence, Newton's Third Law will help him to reach the shore.
6. **(b)** R and S
   Explanation: Rice and potato contain starch. Starch is complex carbohydrate which consists of manly gloucose molecules. It gives blue-black colour with iodine solution.
7. **(b)** (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)
   Explanation: While the nucleic part of the cell had been observed by Leeuwenhoek in 1682, it was Robert Brown who named it the "cell nucleus". In 1839, Johann Evangelist Purkinje coined the term 'protoplasm' for the fluid substance of a cell. Robert Hooke observed the microscopic structure of the bark of a cork tree and in doing so, discovered and named the cell – the building block of life. The 'Cell theory' was proposed by Matthias Jakob Schleiden and Theodor Schwann.
8. **(c)** C
   Explanation: The cells of stripped muscle fibres are cylindrical, unbranched and multinucleate.



Striated muscle fibre

9. **(c)** 2.4 ms^{-1}
   Explanation: The average distance covered in unit time by a moving object is called average speed. The

average speed is the ratio of total distance covered and total time taken.

Average speed = $\frac{Total\ distance\ covered}{Total\ time\ taken}$ = $\frac{10+20+30}{5\ +\ 10\ +10}$ = $\frac{60}{25}$ = 2.4 ms^{-1}

10. **(c)** to resists any change in its state of motion
Explanation: Inertia resists any change in its state of motion.It is a property of matter by which it continues in its existing state of rest or uniform motion in a straight line, unless that the state is changed by any external force.

11. **(a)** Sublimation, dissolving in water, filtration and evaporation
Explanation: Ammonium chloride sublime and can be separated from the mixture of salt and sand by the process of sublimation. Sand can be separated from the mixture of sand and salt by dissolving salt in water and then by filtration. Salt can be separated through the process of evaporation.

12. **(a)** (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)
Explanation:
    - Genes are functional units of heredity that determine the characters of organisms.
    - Diffusion is the process of passage of fluid from a region of high concentration to a region of low concentration. It plays an important role in the gaseous exchange between the cells as well as the cell and its external environment. Water also obeys the law of diffusion.
    - The passage of water from a region of higher water concentration to a region of lower water concentration through a semi-permeable membrane is called osmosis. The movement of water across the plasma membrane is affected by the amount of substance dissolved in water.
    - Plasmolysis is a plant cell that refers to the contraction of protoplast as a result of the loss of water from the cell. The shrinkage of cytoplasm occurs due to exo-osmosis in a hypertonic medium. A hypertonic solution is one that has a lesser concentration of water as compared to that inside the cell. During the process, there is a higher external osmotic pressure and a net flow of water from the cell.

13. **(a)** A : Sclerenchyma, B : Parenchyma, C : Cheek cells, D : Onion Peel
Explanation:
    A. Sclerenchyma: Sclerenchyma cells are the permanent tissues present in the plants. They provide hardness and stiffness to the plant and are composed of dead cells.
    B. Parenchyma: Parenchyma serves as a packing tissue in plants therefore they do not have intercellular spaces.
    C. Figure show Cheek cells.
    D. Figure show Onion peel.

14. **(b)** statement B is true
Explanation: A passenger falls backward when a bus suddenly starts moving in the forward direction due to the inertia of rest. A gun recoils backward with a small speed than the bullet moving forward due to the law of conservation of momentum.

15. **(c)** increase the time to slow down
Explanation: To increase the time to slow down so that jerk is minimised and injury is avoided.

16. **(a)** Bread
Explanation: When iodine solution added in bread its colour change black. So, bread contains starch. Foods made from starchy vegetables, grains or their flours, such as french fries, baked potatoes, breads, pasta, rice, cookies, and cakes, are all high in starches.

17. **(c)** Prokaryotic
Explanation: Prokaryotic cells lack a nuclear envelope and membrane-bound cell organelles.

18. **(a)** stratified epithelium
Explanation: The stratified epithelium contains more than one layer of cells i.e. 2 to 20 or more layers. Skin is an example of stratified epithelium. Stratification of layers prevents wear and tear. The number of cellular layers keeps on changing in the stratified epithelium.

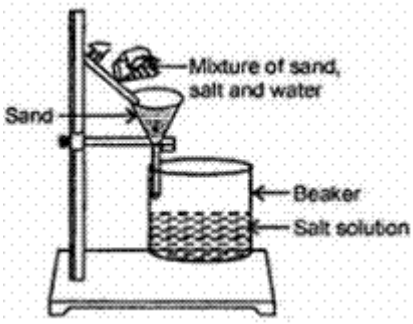
19. **(b)** (A)
Explanation: If there is a decrease in acceleration, it is called Retardation. This means the rate of decrease in velocity is called Retardation. The negative acceleration is termed retardation or deceleration.

SI unit of acceleration (a) is m/s^2 or ms^{-2}.

So, the unit of retardation is $-ms^{-2}$.

20. **(b)** conserve
Explanation: Gun recoil results from the conservation of the total momentum of the bullet-gun system. The backward recoil gun momentum balances the forward bullet momentum to maintain zero total momentum.

21. **(d)**



Explanation: The mixture solution should be added with the help of glass rod and the stem of funnel should touch the side of beaker.

22. **(d)** It can be the site of energy generation.
Explanation: Mitochondria is the site of energy generation. It is not generated in the endoplasmic reticulum.

23. **(b)** cylindrical, unbranched, unstriated uninucleate and involuntary
Explanation: Muscular Tissue consists of elongated cells also called muscle fibres. This tissue is responsible for movement in our body. There are three types of muscular tissue or muscle fibres.
    i. **Skeletal muscles or striated muscles:** These are called voluntary muscles. They are mostly attached to bones and help in body movement. Under the microscope, these muscles show alternate bright and dark bands or striations when stained appropriately Therefore, they are also called striated muscles. The cells of this tissue are long, cylindrical, unbranched, and have many nuclei.
    ii. **Involuntary or smooth muscles:** Smooth muscles or involuntary muscles control involuntary movements. The movement of food in the alimentary canal or the contraction and relaxation of blood vessels are involuntary movements. These muscles are also found in an iris of the eye, in the uterus, and in the bronchi of the lungs. The cells are spindle-shaped and uninucleate.
    iii. **Cardiac muscles:** The heart muscles which show rhythmic contraction and relaxation throughout life are called cardiac muscles. They are cylindrical, branched, and uninucleate.

24. **(d)** Velocity
Explanation: The slope of a position graph represents the velocity of the object. The steeper the slope is, the faster the motion is changing. So the value of the slope at a particular time represents the velocity of the object at that instant. Average velocity can be calculated from a position-time graph as the change in position divided by the corresponding change in time.

Section B

25. **(c)** All have equal inertia
Explanation: Inertia is directly proportional to mass, hence all the above given objects will have equal inertia.

26. **(c)** A Virus
Explanation: Viruses are considered as an intermediate between living and non-living cells because they cannot metabolite and reproduce on their own. They can reproduce only when enters in a host's body. They are an exception to cell theory. A virus crystal is a collection of thousands of viruses. A viral crystal is a pore collection used for chemical studies.

27. **(c)** Areolar
Explanation: Areolar tissues join skin to muscles, fills spaces inside organs and is found around muscles, blood vessels and nerves. Hence are not concerned with bones.

28. **(d)** (ii) and (iii)
Explanation: The muscles which are not under the control of our will, are called involuntary muscles. Smooth (unstriated) muscles and cardiac muscles are involuntary muscles.

29. **(a)** increase in its volume
Explanation: The cell is said to be turgid when the plant cell wall becomes rigid and stretched by an increase in the volume of vacuoles due to the absorption of water when placed in a hypotonic solution.

30. **(b)** (a) - (iii), (b) - (ii),(c) - (iv), (d) - (i)
Explanation: The general definition of Uniform circular motion, Velocity, Acceleration, and Speed is given.
Acceleration of a body is defined as the rate of change of its velocity with time.
The velocity of a body is defined as the rate of change of its displacement with time.
The speed of a body is the distance travelled by it per unit time.
When a body moves along a circular path, then its direction of motion keeps changing continuously. Therefore, the motion along a circular path is said to be accelerated.

31. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: The third law of motion states that when one object exerts a force on another object, the second object instantaneously exerts a force back on the first. These two forces are always equal in magnitude but opposite in direction. The two opposing forces are also known as action and reaction forces.

32. **(d)** A is false but R is true.
Explanation: Plant cells have cell wall to counteract turgor pressure (T.P.) by exerting exactly equal and opposite wall pressure. Wall pressure stops the entry of water into plant cells beyond a certain limit thus prevents their bursting.

33. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: Both A and R are true and R is the correct explanation of A.

34. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: A body has a non-uniform acceleration if its velocity increases by unequal amounts in equal intervals of time.

35. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: If a cell is placed in a hypotonic solution that has lower concentration of solute and higher concentration of water as compared to the concentration of cell sap (i.e., the solution inside the cell), the water molecules move from the external solution into the cell sap and thus, the cell swells.

36. **(c)** Sulphur dissolves to from colourless solution and iron filings settles down
Explanation: Sulphur dissolves to from colourless solution because carbon disulphide is a colourless volatile liquid and a non polar solvent. Being heavy iron filings settles down under the effect of gravity.

37. **(c)** Starch
Explanation: Starch forms a colloidal solution. Colloidal solutions are translucent and their particles can pass through filter paper to give a translucent filtrate.

38. **(d)** parenchyma
Explanation: Parenchyma carries out most of the plant's metabolism. They are "lifetime dividers" and important in healing. They also store starch, oils, and water (H_2O).

39. **(b)** 1-D, 2-A, 3-C, 4-B
Explanation:
    - **Newton's First Law of Motion**: Any object remains in the state of rest or in uniform motion along a straight line until it is compelled to change the state by applying the external force.
    - **Newton's Second Law of Motion**: The rate of change of momentum is directly proportional to the force applied in the direction of the force.
    - **Newton's Third Law of Motion**: There is an equal and opposite reaction for every action.
    - **Galileo Galilei:** Galileo first of all said that objects move with a constant speed when no forces act on them. This means if an object is moving on a frictionless path and no other force is acting upon it, the object would be moving forever. That is there is no unbalanced force working on the object.

40. **(b)** N-s
Explanation: If we multiply the force acting on an object by the time it is acting for this is called the

impulse of a force. Impulse is a vector quantity and its unit is the kilogram meter per second ($kgms^{-1}$) or the newton second (Ns).

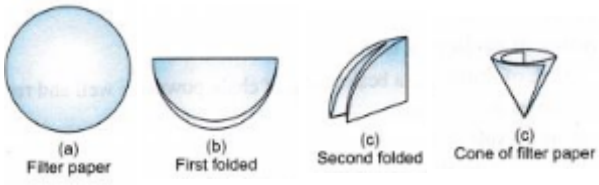
41. **(c)** Golgi apparatus
Explanation: Golgi bodies consist of a system of membrane-bound vesicles arranged in stacks parallel to each other called cisterns. These membranes have connections with the membrane of endoplasmic reticulum (ER). Functions:
    1. It also stores, modifies and helps in the packaging of products in vesicles.
    2. In some cases, complex sugars may be made from simple sugars in it.
    3. It also helps in the formation of lysosomes.

42. **(a)** tendon
Explanation: The bone is a connective tissue with a hard matrix, composed of calcium and phosphorus. A bone is connected by muscle with connective tissue, called a tendon.

43. **(c)** qualitative
Explanation: Qualitative because the first law of motion states that- an object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force.

44. **(b)** china dish
Explanation: China's dish is the right apparatus used for strong heating. So, china's dish is used for heating as it has a high melting point and does not react with sulphur.

45. **(d)** B, A, C, D
Explanation:
First fold the filter paper into half, then to quarter. Now open it in such a manner, three folds on one side and one fold on other side forming cone.



46. **(c)** digestive enzymes
Explanation: Lysosomes enclose digestive enzymes to digest the degenerative cells and tissues

47. **(b)** tracheids
Explanation: The gymnosperms are characterised by the presence of tracheids as their major conducting tissue. These are elongated dead cells with hard lignified walls. They conduct water and do not have open ends like the vessels.

48. **(c)** Cell membrane, cytoplasm, nucleus
Explanation: The cells do not have a cell wall. However, each cell has a thin cell membrane. A large vacuole is present at the center of each cell and is surrounded by the cytoplasm. A lightly stained cytoplasm is observed in each cell. A deeply stained nucleus is observed at the center of each cell.

Section C

49. **(b)** (I) and (II)
Explanation: (I) and (II)

50. **(c)** -180°C
Explanation: -180°C

51. **(a)** Crystallisation
Explanation: Crystallisation

52. **(a)** (I), (III) and (IV)
Explanation: (I), (III) and (IV)

53. **(c)** Robert Hooke
Explanation: Robert Hooke

54. **(d)** Chlamydomonas
Explanation: Chlamydomonas

55. **(d)** Virchow
Explanation: Virchow

56. **(d)** Only (IV)
Explanation: Only (IV)

57. **(b)** The motion of a racing car on a circular track.
Explanation: The motion of a racing car on a circular track.

58. **(d)** accelerated motion
Explanation: accelerated motion

59. **(c)** 5.5 m/s
Explanation: 5.5 m/s

60. **(a)** (II) and (IV)
Explanation: (II) and (IV)