

SECTION –A

Question numbers 1 to 3 in Sections-A one mark questions

1. Which micro-organism lacks any kind of membrane?
2. Mention the nature of motion of a body if its displacement-time graph is a straight line.
3. If a man jumps out from a boat to the bank of the river the boat moves backwards. Identify the action and reaction in this situation.

Question numbers 4 to 6 in Sections-A are two marks questions

4. How surface area and wind speed effects the rate of evaporation. Explain.
5. How is striated squamous epithelial tissue different from squamous epithelial tissue ?
6. A stone and the earth attract each other with an equal and opposite force. Why then we see only the stone falling towards the earth but not the earth rising towards the stone ?

Question numbers 7 to 18 in Sections-A are three marks questions

7. You are provided with mixture of camphor, common salt and soil. Using various techniques how will you separate the components of this mixture. Write the various steps involved.
- 8 . Arrange in the order indicated for solid, liquid and gas.
 - (a) tendency to flow – decreasing order.
 - (b) effect of pressure – increasing order.
 - (c) empty spaces in the particles – decreasing order.
9. Give an example for each of following :
 - (a) Solid – liquid homogeneous mixture
 - (b) Gas – Gas homogeneous mixture
 - (c) Liquid – Liquid heterogeneous mixture
10. (a) Name the different cell organelles which perform functions like protein/lipids make specific digestion, energy generation ?

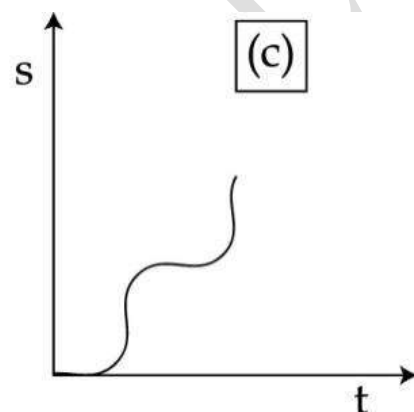
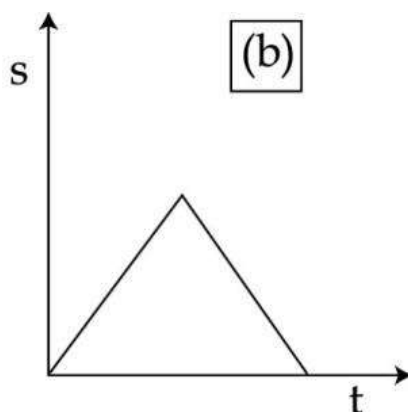
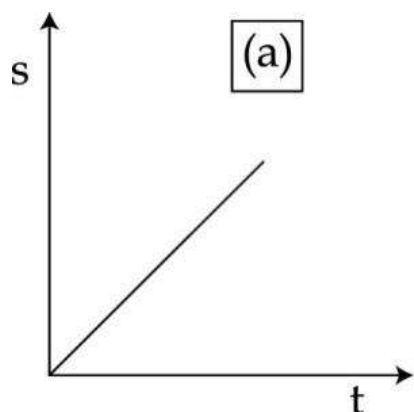
(b) Which ER plays a crucial role in detoxifying many poisons and drugs.

(c) Write functions of Golgi apparatus

11. (a) Mention the location of parenchyma tissue ? (b) How is it modified in aquatic plants ?

(c) What are the other functions that it performs ?

12. Describe the motion represented by the following displacement time graphs :



13. A ball is thrown vertically upwards and it returns to the thrower after 6 sec ($g=9.8 \text{ m/s}^2$) Find.

- (i) The velocity with which it was thrown up. (ii) The maximum height it reaches
 (iii) Its position after 4 sec.

14. The following table show the distance travelled by three objects in every second.

Time	Distance travelled (in m)		
	Object A	Object B	Object C
1st sec	10	5	12
2nd sec	10	10	8
3rd sec	10	15	15
4th sec	10	20	17
5th sec	10	25	12

(a) Classify the motion of the three objects as uniform or non-uniform motion.

(b) Who has travelled : (i) maximum and (ii) minimum distance in 4th sec ?

(c) Calculate the total distance travelled by „A“.

15. Explain why, the motion of a body which is moving with constant speed in a circular path is said to be accelerated ? The minute hand of a clock is 7 cm long. Find the displacement and the distance covered by it from 9.00 am to 9.30 am.

16. If the mass of a planet is double the mass of earth and if the radius of the planet is half the radius of earth. Calculate the value of 'g' of the planet.

17. Vinod visited his ancestral village. He found that farmers in a village were facing problems like stagnant crop yields, pollution of soil and water bodies due to pesticides, increasing cost of fertilizers, reducing soil fertility, pest infestation. Vinod understood their problems and took them to agricultural department. The officials suggested organic farming.

(i) What is meant by sustainable agriculture ?

(ii) What can be done to reduce soil pollution and maintain soil fertility ?

(iii) What values farmers must have so that they do not harm the environment ?

18. Explain the ways by which crop - production can be increased .

Question numbers 19 to 24 in Sections-A are five marks questions.

19. (a) Compare metals and nonmetals based on their physical properties (any four points).

(b) What are metalloids? Give two examples.

(c) Identify metals from the following – boron, sodium, mercury, carbon.

20. (a) Illustrate an activity to demonstrate that particles of matter have spaces between them.

(b) Explain why a diver is able to cut through water in a swimming pool.

21. Name the constituents of xylem tissue. Draw labelled diagram of any three constituents.

22. (a) State law of conservation of momentum. Express it mathematically, when two bodies of masses m_1 and m_2 moving in same direction along same straight line with velocity u_1 and u_2 respectively, collide and their respective velocity after collision becomes V_1 and V_2 .

(b) A hammer of mass 500g moving at 50 ms^{-1} strikes a nail. The nail stops the hammer in a small time interval of 0.01/s. What is the change in momentum suffered by the hammer? Also calculate the force of the hammer on the nail. What will be the force of the nail on the hammer? Give reason for your answer.

23. State with reasons, if it is possible or impossible, for an object in motion to have :

(a) Zero distance covered and may have non zero displacement.

(b) Zero speed at an instant but non zero acceleration at the same time.

(c) Zero speed and may have non zero velocity.

(d) Acceleration opposite to the direction of motion.

31. While observing a permanent slide under microscope Rita identified the slide as of striated muscles due to :

- (a) uninucleate and spindle shaped cells (b) multinucleate and unbranched cells
(c) uninucleate and branched cells (d) multinucleate and branched cells Ans: (d)

32. When a mixture of sand, chalk and sodium chloride is dissolved in water and then filtered. What will be left on the filter paper and what is it called ?

- (a) sodium chloride ; filtrate (b) chalk; distillate .
(c) chalk, and sand; filtrate (d) chalk and sand; residue Ans: (d)

33. When two equal and opposite forces act on an object, it will be observed that :

- (a) Object remains at rest (b) Object continues to move with constant velocity if it was moving
(c) Both (a) and (b) (d) Information is insufficient Ans: (c)

34. Identify two clear and transparent solutions from the following mixtures:-

- (a) milk and water (b) sugar and water (c) chalk powder and water
(d) starch powder and water (e) glucose and water

Ans: Following are the clear and transparent solution: 1. Sugar and water 2. Glucose and water are the two

35. If in the determination of melting point of ice, the ice is contaminated with some non-volatile impurity like common salt, how the melting point of ice is affected

Ans: The melting point of ice will decrease

36. A teacher soaked 10g raisins in 35ml of distilled water in a beaker A and similar amount in beaker B. She maintained the temperature of beaker A at 20°C and beaker B at 40°C. After an hour compare the percentage of water absorbed by the raisins in beakers A and B.

1. Bacteria 2. Uniform motion

3. While jumping out of the boat, your foot exerts a backward force on the boat. This force is called action.

A force is exerted by the boat on your foot in forward direction. This force is called reaction force.

4. If the surface area is increased, the rate of evaporation increases. The rate of evaporation increases with the increase in wind speed

5. Simple Squamous epithelial cells are extremely thin and flat and form a delicate lining e.g. lining of the oesophagus. Stratified Squamous epithelium cells are arranged in a pattern of layers e.g. skin .

6. This is because acceleration of the body is inversely proportional to mass of the body. Since mass the earth is massive, the earth not rising towards the stone.

7. Firstly the mixture will be heated. As camphor is sublime, it will vaporize and separated through sublimation.

To separate mixture of common salt and soil, we will dissolve them in water . As salt is soluble in water, and soil is not soluble in water, soil can be separated through filtration. At the end we get salt solution. Salt can be separated from water by evaporation.

8. (a) Tendency to flow – decreasing order. – Gas, liquid, solid

(b) Effect of pressure – increasing order. – solid, liquid, Gas, (c) Empty spaces in the particles – decreasing order.- Gas, liquid, solid

9. (a) Solid – liquid homogeneous mixture - A solution of sugar in water

(b) Gas – Gas homogeneous mixture - Air (c) Liquid – Liquid heterogeneous mixture - Milk, face cream

10. (a) protein or lipid making - Ribosomes , Specific digestion - Lysosomes and energy generation - mitochondria

(b) Smooth ER plays a crucial role in detoxifying many poisons and drugs in liver.

(c) A major function is the modifying, sorting and packaging of proteins for secretion. It is also involved in the transport of lipids around the cell, and the creation of Lysosomes.

11. (a) Parenchyma. It is the main tissue in the plant body, occurring in almost all regions. It is particularly abundant in the root and stem.

(b) In aquatic plants, large air cavities are present in parenchyma to give buoyancy to the plants to help them float.

Such a parenchyma type is called Aerenchyma.

(c) The parenchyma of stems and roots also stores nutrients and water.

12. (a) uniformly accelerates (b) uniformly accelerates and retarded (c) Non uniform

13. A ball is thrown vertically upwards and it returns to the thrower after 6 sec ($g = 9.8 \text{ m/s}^2$) Find. (i) The velocity with which it was thrown up (ii) The maximum height it reaches (iii) Its position after 4 sec.

Time of ascent = Time of descent = $6/2 = 3\text{sec}$

At the end of 3 s the ball would have reached maximum height

$$v = 0, g = -9.8 \text{ s}; v = u + at \Rightarrow 0 = u + (-9.8)(3) \Rightarrow u = 29.4\text{m/s}$$

Therefore the ball was thrown up with velocity 29.4 m/s

$$\text{Now for max height: } s = ut + \frac{1}{2} at^2 = (29.4)(3) + \frac{1}{2} (9.8)(9) = 88.2 + 44.1 = 132.3\text{m}$$

The ball reached 132.3m before coming down after 3sec.

After 1 sec from when fall from 132.3m, $u = 0\text{m/se}$, $g = 9.8\text{m/s}^2$

$$S = ut + \frac{1}{2} gt^2 = 0 \times 1 + 0.5 \times 9.8 \times 1 \times 1 = 4.9\text{m}$$

Its position after 4 sec = $(132.3 + 4.9) = 137.2\text{m}$

14. (a) The motion object A and B is uniform and the motion object C is non-uniform motion.

(b) (i) object B has travelled maximum and (ii) object A has travelled minimum distance in 4th sec? (c) The total distance travelled by A is 50m

15. In circular motion body always moving with a certain uniform speed and changed its direction at every point. Because of the change in direction, it moved with a variable velocity and has some definite acceleration. This is why circular motion is called accelerated motion

Radius = 7cm Distance = Half the Circumference of the circle = $2\pi r/2 = \pi r = 22/7 \times 7 = 22 \text{ cm}$

Displacement = Diameter = Twice the radius = $2 \times 7 = 14 \text{ cm}$

16. If the mass of a planet is double the mass of earth and if the radius of the planet is half the radius of earth. Calculate the value of 'g' of the planet.

Let the mass of Earth be M and Radius Be R , Then the mass of planet be 2M and Radius Be R/2

$$g \text{ on earth} = \frac{G \times 2M}{R^2} = 10\text{m/s} \quad \text{So, } g \text{ on planet} = \frac{G \times 2M}{\left(\frac{R}{2}\right)^2} = 4 \times \frac{G \times 2M}{R^2} = 4 \times 10 = 40\text{m/s}^2$$

17. (i) Sustainable agriculture refers to the practice of raising food in both quantity and quality with the judicious use of resources and without exploiting the environment (ii) Soil pollution can be prevented reducing uses pesticides and fertilizers and increasing organic farming (iii) Environmental conscious

18. Explain the ways by which crop - production can be increased.

1. Using High Yielding Variety seeds 2. Using organic manures instead of using chemical fertilisers.

3. Multiple cropping 4. Inter-cropping. 5. Providing better irrigation facilities.

19. (a)

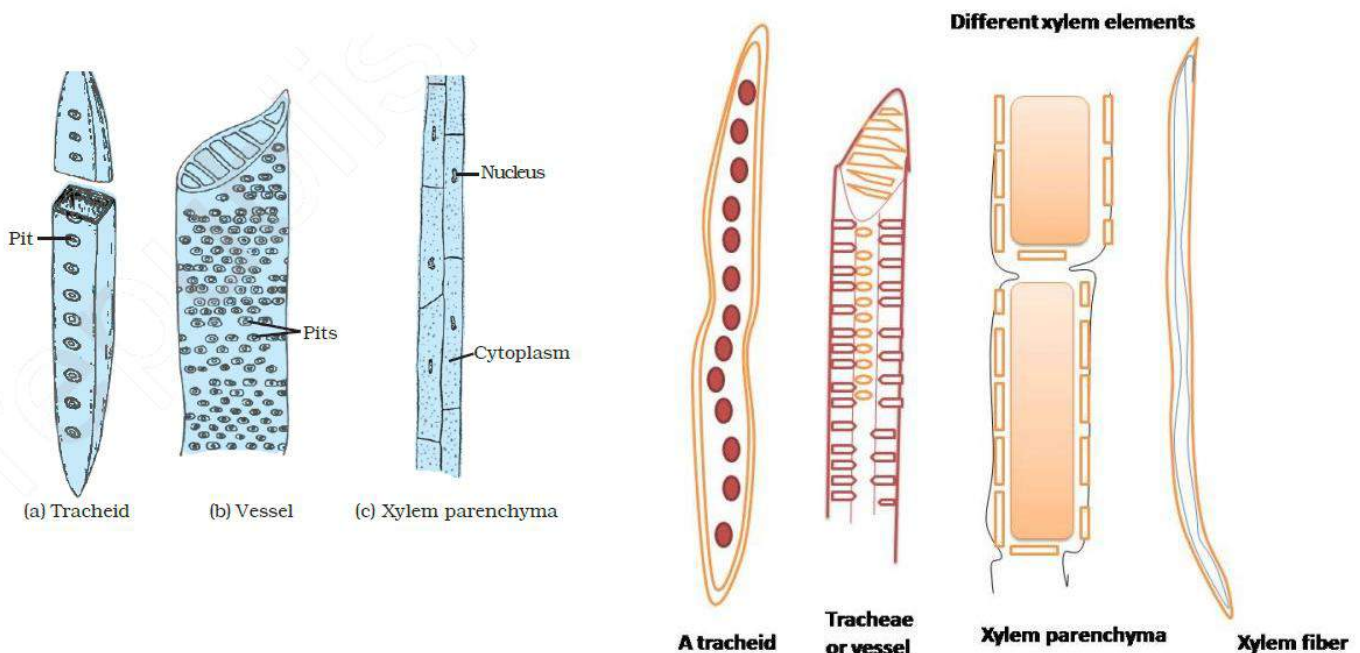
Metal	Non Metal
metals have a lustre (shine).	Non metals have no lustre (shine).
metals conduct heat and electricity.	Non metals do not conduct heat and electricity.
metals are ductile	Non metals are not ductile
metals are malleable	Non metals are not malleable

(b) elements have intermediate properties between those of metals and non-metals, they are called metalloids; examples are boron, silicon, germanium etc. (c) metals are – sodium, mercury

20. (a) Take a 100 mL beaker. Fill half the beaker with water and mark the level of water. Dissolve some salt/ sugar with the help of a glass rod. There is no change in water level. the particles of salt get into the spaces between particles of water (b) A diver is able to cut through water in a swimming pool as intermolecular force of attraction is very weak and there is spaces between particles of water .

21. Name the constituents of xylem tissue. Draw labelled diagram of any three constituents.

The constituents of xylem tissue are xylem tracheids; vessels (or tracheae); xylem parenchyma; xylem fibre (sclerenchyma).



22. (a) Law of conservation of momentum : the sum of momentum of the two objects before collision is equal to the sum of momentum after the collision if there is no external unbalanced force acting on them.

Let two bodies of masses m_1 and m_2 moving in same direction along same straight line with velocity u_1 and u_2 respectively, collide and their respective velocity after collision becomes V_1 and V_2 .

According to the third law of motion, the force F_{AB} exerted by ball A on ball B (action) and the force F_{BA} exerted by the ball B on ball A (reaction) must be equal and opposite to each other. Therefore,

$$F_{AB} = -F_{BA} \Rightarrow m_1(v_1 - u_1)/t = -\{m_2(v_2 - u_2)/t\} \Rightarrow m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$$

(b) A hammer of mass 500g moving at 50 ms⁻¹ strikes a nail. The nail stops the hammer in a small time interval of 0.01/s. What is the change in momentum suffered by the hammer? Also calculate the force of the hammer on the nail. What will be the force of the nail on the hammer? Give reason for your answer.

Mass of the hammer, $m = 500 \text{ g} = 0.5 \text{ kg}$ Initial velocity of the hammer, $u = 50 \text{ m/s}$

Time taken by the nail to stop the hammer, $t = 0.01 \text{ s}$

Velocity of the hammer, $v = 0$ (since the hammer finally comes to rest)

The change in momentum suffered by the hammer = $m(v-u) = 0.05(0-50) = -2.5 \text{ kgm/s}$

From Newton's second law of motion: The force of the hammer on the nail = $F = m(v-u)/t = 0.05(0-50)/0.01 = -2500\text{N}$

The hammer strikes the nail with a force of -2500 N .

Hence, from Newton's third law of motion, the force of the nail on the hammer is equal and opposite, i.e., $+2500 \text{ N}$.

23. Statement with reasons, if it is possible or impossible, for an object in motion to have:

- (a) Zero distance covered and may have non zero displacement. – Impossible as distance of moving body cannot be zero
- (b) Zero speed at an instant but non zero acceleration at the same time. Possible: if a ball is thrown vertically upward, At the highest point speed is zero but acceleration is non zero.
- (c) Zero speed and may have non zero velocity. Impossible – if a body has non zero velocity must have speed
- (d) Acceleration opposite to the direction of motion. Possible: : when a moving car applies the break its velocity decreases. The acceleration is against the direction of motion of the car.
- (e) Positive acceleration while speeding up : Possible because acceleration is the rate of the change in velocity ($v-u/t$)

24. Mixed cropping is growing two or more crops simultaneously on the same piece of land, for example, wheat + gram, or wheat + mustard. This reduces risk and gives some insurance against failure of one of the crops.

Inter-cropping is growing two or more crops simultaneously on the same field in a definite pattern, for example, soyabean + maize. Inter-cropping help in maximum utilisation of the nutrients, and also prevents pests and diseases from spreading to all the plants belonging to one crop in a field

crop rotation : The growing of different crops on a piece of land in a pre-planned succession is known as crop rotation. Two or three crops can be grown in a year with good harvests.