

8. Which one of the following statements is not true?
- The molecules in a solid vibrate about a fixed position
 - The molecules in a liquid are arranged in a regular pattern
 - The molecules in a gas exert negligibly small forces on each other, except during collisions
 - The molecules of a gas occupy all the space available

Each question consists of two statements, namely Assertion (A) and Reason (R). For selecting the correct answer

- Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
- Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
- Assertion (A) is true, and Reason (R) is false.
- Assertion (A) is false, and Reason (R) is true.

9. Assertion: uniform Circular motion is an example of uniform accelerated motion.

Reason: In uniform circular motion there is no change in velocity.

10. Assertion: A man weighing 600N on earth ,weighs only 100 N on the moon.

Reason: Mass of the man remains the same whether measured on the earth or on the moon. (1X10=10)

11. A cyclist moving on a circular track of a radius of 100 m completes one revolution in 2 minutes. What are the average speed and average velocity? (1+1)

Using mathematical formulation, explain Newton's Second law of motion.

OR

A body of mass 1 kg starting from rest, undergoes a change of velocity of 4m/s in 4s. Calculate the change in momentum and force acting on it? (1+1)

12. A train starting from rest attains a velocity of 108 km/h in 10 minutes. Assuming that the acceleration is uniform, find (i) the acceleration and (ii) the distance traveled by the train for attaining this velocity. (1 ½ + 1 ½)

13. i) Water sprinkler used for grass lawns begins to rotate as soon as the water is supplied. Explain the principle/law on which it works.

ii) Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.

iii) Differentiate balanced and unbalanced force. (1+1+1)

14. A ball is thrown vertically upwards and reaches a maximum height in 3s. Take $g = 10\text{m/s}^2$

Find i) The velocity with which the ball is thrown upwards.

ii) The maximum height attained by the ball. (1 ½ + 1 ½)

15. i) Establish a relationship between acceleration due to gravity in terms of mass and radius of the Earth.

ii) Value of acceleration due to gravity on the surface of Earth is 9.8 m/s^2 . Taking Earth to

be a perfect sphere of radius $6 \times 10^6\text{ m}$. Find the mass of the Earth.

iii) Is the value of acceleration due to gravity, same in all places on the Earth? Give a reason. (2+2+1)

OR

i) State the Universal law of Gravitation.

ii) What happens to the gravitational force between two objects if the masses of both the objects are doubled and the distance between them is also doubled.

iii) Find out the gravitational force between the masses, if two masses are 30 kg and 50

kg respectively, placed at 4m apart from each other. (1+2+2)

16. Read the following case base paragraph and answer the following questions.

For many centuries, the problem of motion and its causes had puzzled scientists and philosophers. A ball on the ground, when given a small hit, does not move forever. Such observations suggest that rest is the "natural state" of an object. This remained the belief until Galileo Galilei and Isaac Newton developed an entirely different approach to understand motion. Newton further studied Galileo's ideas on force and motion and presented three fundamental laws that govern the motion of objects.

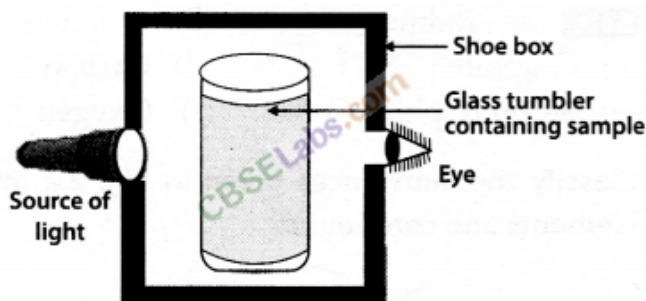
- a) Why does an athlete run a certain distance before taking a leap ? 1
b) State Newton's first law of motion. 1
c) A car and a motorbike both are running at the same speed. Which of the two has greater momentum and why? 2

OR

Calculate the change in momentum of a body weighing 5kg, when its velocity decreases from 20 m/s to 0.20 m/s. 2

SECTION B (CHEMISTRY) -23 MARKS

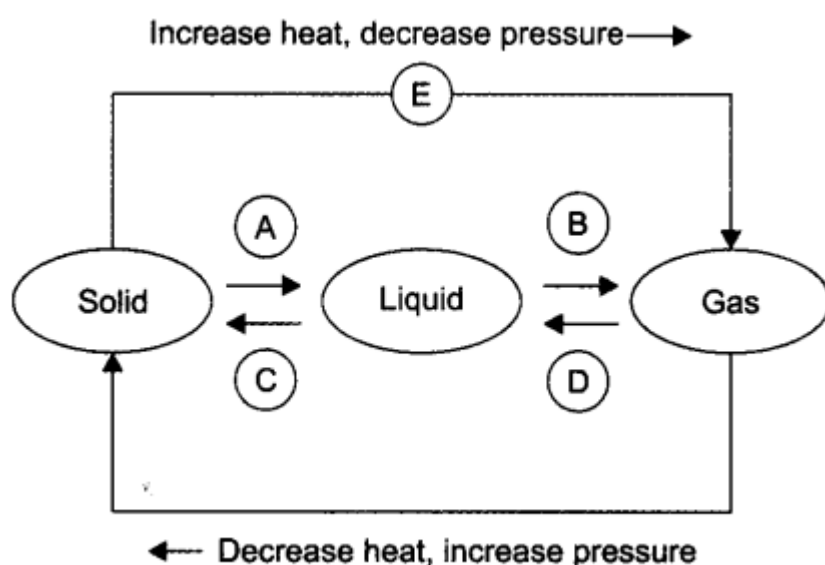
- Which one of the following statements is not true?
(a) The molecules in a solid vibrate about a fixed position
(b) The molecules in a liquid are arranged in a regular pattern
(c) The molecules in a gas exert negligibly small forces on each other, except during collisions
(d) The molecules of a gas occupy all the space available
- On converting 308 K, 329 K and 391 K to Celsius scale, the correct sequence of temperatures will be:
(a) 33°C, 56°C and 118°C (b) 35°C, 56°C and 119°C
(c) 35°C, 56°C and 118°C (d) 56°, 119°C and 35° C
- Which of the following phenomena always results in the cooling effect?
(a) Condensation (b) Evaporation (c) Sublimation (d) None of these
- In tincture of iodine, find the solute and solvent?
(a) alcohol is the solute and iodine is the solvent
(b) iodine is the solute and alcohol is the solvent
(c) any component can be considered as solute or solvent
(d) tincture of iodine is not a solution
- A pure substance which is made up of only one kind of atom and cannot be broken into two or more simpler substances by physical or chemical means is referred to as
(a) a compound (b) an element (c) a molecule (d) a mixture
- Assertion - A sponge is the solid matter which we easily compressed by hand .
Reason - The matter around us exists in three different states: solid, liquid, gas.
(a) Both Assertion (A) and Reason (R) are the true and Reason (R) is a correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
(c) Assertion (A) is true, and Reason (R) is false.
(d) Assertion (A) is false, and Reason (R) is true. (1X6=6)
- Why does the temperature of a substance remain constant during its melting point or boiling point? (2)
- A group of students took an old shoe box and covered it with black paper from all sides. They fixed a source of light (a torch) at one end of the box by making a hole in it and made another hole on the other side to view the light. They placed a milk sample contained in a beaker/tumbler in the box as shown in the Fig. They were amazed to see that milk taken in the tumbler was illuminated. They tried the same activity by taking a salt solution but found that light simply passed through it?



- (a) Explain why the milk sample was illuminated. Name the phenomenon involved.
 (b) Same results were not observed with a salt solution. Explain.
 (c) Can you suggest two more solutions which would show the same effect as shown by the milk solution? (3)
9. Give reason for the following observations.
 (a) Naphthalene balls disappear with time without leaving any solid.
 (b) We can get the smell of perfume sitting several metres away.
 (c) What produces more severe burns, boiling water or steam? (3)
15. 10. (a) To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find its concentration at this temperature.
 (b) Classify the following as chemical or physical changes:
 i) cutting of trees, ii) melting of butter in a pan, iii) rusting of almirah, iv) boiling of water to form steam, v) passing of electric current, through water and the water breaking down into hydrogen and oxygen gas, vi) dissolving common salt in water(5)

OR

- (a) Name A, B, C, D, E and F in the following diagram showing change in its state



- (b) i) Why are we able to sip hot tea or milk faster from a saucer rather than a cup?
 ii) Why should we wear cotton clothes in summer?
16. Matter is anything that occupies space and has mass. Matter is classified into solid, liquid and gas. In solid state particles are closely packed and have very strong force of attraction, particles can only vibrate and rotate around fixed positions. In liquid state, particles are less closely packed and have a stronger force of attraction but less than solids, particles can move throughout the liquid. In the Gaseous state, particles are far apart with weak force of attraction and are in a state of constant random motion. Gases can be easily compressed whereas solids and liquids

17. a) A substance melts at 5°C and boils at 150°C. What will be its physical state at room? 1
- b) Why do we feel more cold after taking bath with hot water? 1
- c) An inflated balloon is placed in refrigerator, what will happen? Explain. 2
- OR
- c) What is meant by compressibility and fluidity? 2

SECTION C (BIOLOGY) 27 MARKS

- Select the odd group from the following.

(a) Chlamydomonas, Paramecium, bacteria	(b) Fungi, Plants, Animals
(c) Sperm, Neuron, Amoeba	(d) Schleiden, Schwann, Virchow (1)
- Select the odd one out.
 - The movement of water across a semi-permeable membrane is affected by the amount of substances dissolved in it.
 - Membranes are made of organic molecules like proteins and lipids.
 - Molecules soluble in organic solvents can easily pass through the membrane.
 - Plasma membranes contain chitin sugar in plants. (1)
- Which of the following helps in increasing the width and the girth of the plants?

(a) Apical meristem (b) Lateral meristem (c) Intercalary (d) Permanent tissue (1)
- Meristematic tissues in plants are

(a) localised and permanent	(b) not limited to certain regions
(c) localised and dividing cells	(d) growing in volume. (1)
- Assertion: Plasma membrane is selectively permeable.
Reason: Plasma membrane allows some molecules to pass through it more easily than others.
 - Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
 - Both Assertion (A) and Reason (R) are true, but Reason (R) is not a correct explanation of Assertion (A).
 - Assertion (A) is true, and Reason (R) is false.
 - Assertion (A) is false, and Reason (R) is true. (1)
- Draw a neat labeled diagram of Mitochondria and explain how it is structurally modified to increase the surface area for ATP production. (2)
- Which kind of plastid is more common in
 - roots of the plant
 - leaves of the plant
 State the function of each. (2)
- Describe the structure and function of stomata. (3)
- Give reasons
 - Cork is impervious to water
 - Coir ropes are strong and non flexible
 - Branches of a tree bend freely in high wind velocity (3)
- Draw a longitudinal section of phloem tissue and identify the phloem elements. Also name the conducting elements of xylem. (3)
- a) Draw a neat diagram of an animal cell and label the following parts
 - Secretory organelle of the cell
 - Protein factories of the cell
 - Digestive bags of the cell

- iv) transport channel of the cell
b) State the functions of plasma membranes. (3+2)

OR

- a) Draw a neat diagram of a plant cell and label the following parts
i) The transport channel of the cell
ii) The kitchen of the cell
iii) The director of the cell
iv) The storage bags of the cell
b) How is the mitochondrial membrane modified for its function?
c) Which part of a plant cell is non living? State any one function of this part.
(3+1+1)

12.Water also obeys the laws of diffusion.The movement of solvent molecules through a a selectively permeable membrane is called osmosis. The movement of water across the plasma membrane is affected by the amount of substances dissolved in it. Thus osmosis is the passage of water from high water concentration through a semipermeable membrane to low water concentration.

- a) State any two differences between diffusion and osmosis
b) What happens to a Rheo leaf cell when it is kept in glucose solution. Explain(2+2)

OR

- a) Define the term plasmolysis and hypotonic solution.
b) RBC when put in distilled water will burst while an onion peel cell does not. Explain
(2+2)