

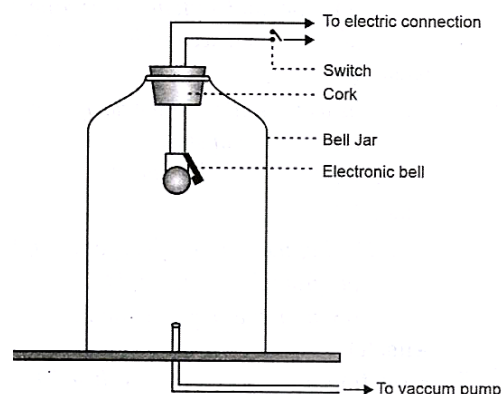
SYLLABUS : FULL SYLLABUS .**GENERAL INSTRUCTIONS : Draw Diagrams with Pencils.**

- All questions are compulsory. **Maximum Marks are 80.**
- The question paper consists of 30 Questions.
- **Section – A** : Question 1 to 14 are 1 mark each.
- **Section – B** : Question 15 to 24 are 3 marks each.
- **Section – C** : Question 24 to 30 are 5 marks each.

SECTION A : (1 × 20 = 20)

1. Rate of diffusion is faster in gases. Why?
2. “Tyndall Effect can be observed when sunlight passes through the canopy of dense forest.” Explain how this occurs.
3. Answer question number 3(a) - 3 (d) on the basis of your understanding of the following paragraph and the related studied concepts.

Sound is a mechanical wave and needs a material medium like air, water, steel etc. for its propagation. It cannot travel through vacuum, which can be demonstrated by the following experiment. Take an electric bell and an airtight glass bell jar. The electric bell is suspended inside the airtight bell jar. The bell jar is connected to a vacuum pump, as shown in fig. if you press the switch you will be able to hear the bell. Now start the vacuum pump. When the air in the jar is pumped out gradually, the sound becomes fainter, although the same current is passing through the bell. After some time when less air is left inside the bell jar you will hear a very feeble sound. What will happen if the air is removed completely? When vacuum, is created inside the jar no sound of the ringing bell will be heard.



- (a) What type of wave is sound?
 - (b) What is the purpose of the vacuum pump?
 - (c) What happens when the switch is pressed with air inside the jar?
 - (d) What will happen if the air inside the jar is removed completely?
4. Question number 4 is based on the paragraph given below. Study this paragraph and answer the questions that follow.

The pressure exerted by air is called atmospheric pressure. The pressure is generally measured in atmosphere. The atmospheric pressure at sea level is 1 atmosphere and is taken as normal atmospheric pressure.

$$1 \text{ atm} = 760 \text{ mm of Hg} = 76 \text{ cm of mercury}$$

At a depth of 33 ft below the sea level, an additional 1 atm pressure is exerted by water. Other units of pressure are torr and bar. S.I. unit of pressure is pascal (Pa) ($1 \text{ atm} = 1.013 \times 10^5 \text{ Pa}$). Applying pressure and reducing temperature can liquefy gases.

Have you heard of solid carbon dioxide (CO_2)? It is stored under high pressure. Solid CO_2 gets converted directly to gaseous state on decrease of pressure to 1 atmosphere without into liquid state.

This is the reason that solid carbon dioxide is also known as dry ice.

Thus, we can say that pressure and temperature determine the state of a substance, whether it will be solid liquid and gas.

- When we blow air into a balloon, it inflates because
 - Air particles diffuse in balloon
 - Air particles collide with walls of balloon and exert pressure on them
 - Rubber is elastic in nature
 - The temperature of air in the balloon becomes high
- At a depth of 100 ft below sea level what is the value of total pressure experience by a diver?
 - 1 atm
 - 2 atm
 - 3 atm
 - 4 atm
- A pressure of 1520 mm of mercury is equal to:
 - 1.5 atm
 - 2 atm
 - 1 atm
 - 2.5 atm
- Which is the most favourable condition for liquefaction of ammonia?
 - Low pressure and low temperature
 - High pressure and high temperature
 - Low pressure and high temperature
 - High pressure and low pressure
- A particle accelerates from rest at a constant rate for sometime and attains a constant velocity of 8 m s^{-1} . Afterwards it decelerates with a constant rate and comes to rest. If the total time taken is 4 second, the distance travelled is:
 - 32 metre
 - 16 metre
 - 4 metre
 - insufficient data

OR

The velocity – time graph of a body has a negative slope. The body is undergoing:

- uniform acceleration
 - uniform retardation
 - variable acceleration
 - variable retardation
- Newton's second law of motion gives us a measure of:
 - force
 - momentum
 - inertia
 - acceleration
 - Law of gravity gives the gravitational force between:
 - The earth and a point mass only
 - The earth and sun only
 - Any two bodies having some mass
 - two charged bodies only
 - Which of the following are exotic breeds?
 - Prawn
 - Jersey
 - Brown Swiss
 - Jersey Swiss
 - (i) and (iii)
 - (ii) and (iii)
 - (i) and (iv)
 - (ii) and (iv)
 - Rutherford's alpha – particle scattering experiment was responsible for the discovery of:
 - Atomic Nucleus
 - Electron
 - Proton
 - Neutron
 - Which of the following would weigh the highest?
 - 0.2 mole of sucrose ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$)
 - 2 moles of CO_2
 - 2 moles of CaCO_3
 - 10 moles of H_2O
 - Which of the following tissues has dead cells?
 - Parenchyma
 - Sclerenchyma
 - Collenchyma
 - Epithelial tissue
 - Amphibians do not have the following:
 - Three chambered heart
 - Gills or lungs
 - Scales
 - Mucus glands

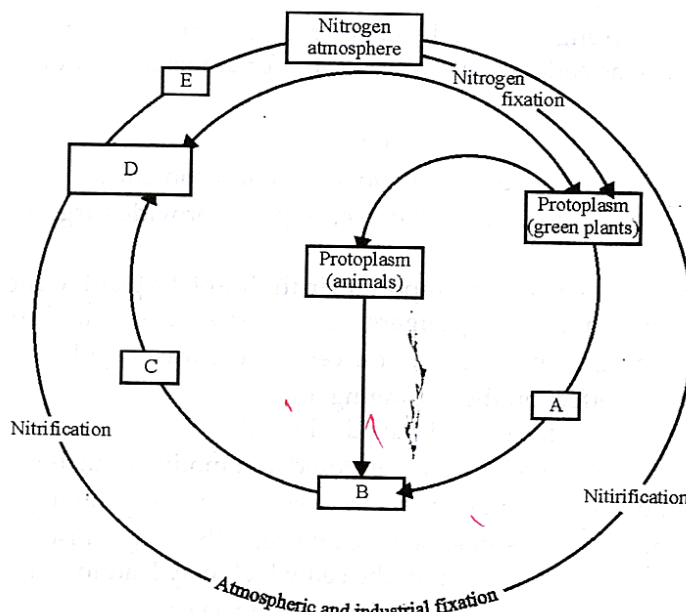
24. There are three solids made up of aluminium, steel and wood, of the same shape and same volume. Which of them would have highest inertia?

OR

Two balls of the same size but of different materials, rubber and iron are kept on the smooth floor of a moving train. The brakes are applied suddenly to stop the train. Will the balls start rolling? If so, in which direction? Will they move with the same speed? Give reasons for your answer.

SECTION C : (5 × 6 = 30)

25. (a) You are provided with a mixture of naphthalene and ammonium chloride by your teacher. Suggest an activity to separate them with well labelled diagram.
 (b) Define the following terms: (any two)
 (i) Rigidity (ii) Compressibility and (iii) Density
26. (i) State the law of constant proportion.
 (ii) Write the chemical formulae of the compounds formed by the following ions:
 (a) Mg and S (b) Cu and OH (c) Al and Br
 Name the compounds formed in each case.
27. (a) Study the given figure of nitrogen cycle and mention what do A, B, C, D, E represent.
 (b) What will happen if step A does not occur?
 (c) Write the role of N₂ fixing bacteria in the biosphere.
 (d) Name two biologically important compounds that contain both O₂ and N₂.



28. Give short answers:
 (i) What is the role of proteins and lipids in the plasma membrane?
 (ii) Why plasma membrane is called as selectively permeable?
 (iii) What is the role of cellulose in cell wall?
 (iv) What is meant by plasmolysis?
 (v) What is the advantage of flexibility of cell membrane?
 (vi) Name the process which is useful for the moment of substance like CO₂ and O₂ across the cell membrane.

OR

- (a) What role vacuoles play in a typical plant cell?
- (b) What will happen if Golgi Apparatus is removed from the cell?
- (c) Why the inner membrane of mitochondria deeply folded?
29. (i) A motorcar of mass 500 g, moving along a straight line with a uniform velocity of 90 km/h. Its velocity is slowed down to 18 km/h in 4 s by an unbalanced external force. Calculate the acceleration and change in momentum. Also calculate the magnitude of the force required.
- (ii) How much momentum will a dumb – bell of mass 10 kg transfer to the floor if it falls from a height of 80 cm? Take its downward acceleration to be 10 m s^{-2} .
30. The graph below shows the positions of a body at different times. Calculate the speed of the body as it moves from (i) A to B, (ii) B to C and (iii) C to D?

