

CLASS 8 | PHYSICS | ICSE-ALIGNED CHAPTER TEST

MATTER: PARTICLE MODEL, STATES AND CHANGES OF STATE

Maximum Marks: 80 Writing Time: 2 hours Reading Time: 15 minutes

Name: _____ Batch: _____ Date: _____

Instructions: Answer on separate sheets. Attempt all of Section A and any four complete questions from Section B. Read the paper during the first 15 minutes. Label diagrams clearly. Marks are in []. This is an original school-level chapter test aligned to the CISCE upper-primary curriculum.

SECTION A - 40 MARKS (Attempt all questions.)

Question 1. Choose the correct answer. Write the option and answer. [10 x 1 = 10]

- (1) Matter is anything that:
 - (a) has only shape (b) has mass and occupies space (c) is always visible (d) is always solid
- (2) Which state has a definite volume but no definite shape?
 - (a) solid (b) liquid (c) gas (d) none of these
- (3) Particles in a solid:
 - (a) remain completely motionless (b) move freely throughout the container
 - (c) vibrate about fixed positions (d) have no attraction between them
- (4) The direct change from solid to gas is called:
 - (a) melting (b) freezing (c) condensation (d) sublimation
- (5) During evaporation, a liquid changes into vapour:
 - (a) only at its boiling point (b) only from its surface
 - (c) throughout its bulk with bubbles (d) only below 0°C
- (6) Which condition helps wet clothes dry faster?
 - (a) high humidity (b) still air (c) warm moving air (d) smaller exposed area
- (7) Water droplets on the outside of a cold glass mainly come from:
 - (a) water leaking through glass (b) melting glass
 - (c) water vapour in the surrounding air (d) oxygen turning into water
- (8) Gas in a sealed syringe is compressed easily because its particles:
 - (a) become smaller (b) have large spaces between them
 - (c) disappear (d) stop moving
- (9) Statement I: Gas particles move randomly. Statement II: Heating a gas generally increases the average speed of its particles.
 - (a) both true (b) both false (c) only I true (d) only II true
- (10) Assertion (A): Evaporation causes cooling. Reason (R): Faster particles escape, leaving particles with lower average kinetic energy.
 - (a) A true, R false (b) A false, R true
 - (c) both true; R explains A (d) both true; R does not explain A

Question 2. Complete the following. [10]

- (i) Fill in the blanks: (a) The tiny particles of matter are in continuous _____. (b) The force attracting particles to one another is called _____ attraction. (c) Liquid changing to solid is called _____. (d) Gas changing directly to solid is called _____. (e) Heating usually increases the average _____ energy of particles. [5]
- (ii) Name the process in each case: (a) Ice turns into water. (b) Steam turns into liquid water on a cool lid. (c) A puddle slowly dries below the boiling point. (d) Camphor changes directly into vapour. (e) Bubbles of water vapour form throughout heated water at its boiling point. [5]

Question 3. Match and correct. [10]

- (i) Match each item in Column A to the most suitable description in Column B. Write the letter-number pairs. [5]

Column A	Column B
(a) Solid	1. Vapour changes to liquid
(b) Liquid	2. No fixed shape or volume
(c) Gas	3. Fixed shape and volume
(d) Condensation	4. Surface process that causes cooling
(e) Evaporation	5. Fixed volume; takes the shape of its container

- (ii) Write True or False. Correct each false statement. (a) Particles of matter have spaces between them. (b) Liquids are as easily compressed as gases. (c) Evaporation can occur below the boiling point. (d) Solid particles do not move at all. (e) Boiling occurs only at the surface of a liquid. [5]

Question 4. Answer briefly. [10]

- (i) Define diffusion. Give one everyday example involving gases. [2]
- (ii) State two differences between solids and liquids in terms of particle arrangement and movement. [2]
- (iii) Why can air be compressed much more than water? Explain using particle spacing. [2]
- (iv) Name one change of state that absorbs heat and one that releases heat. [2]
- (v) Explain why a liquid can flow whereas a solid normally retains its shape. [2]

SECTION B - 40 MARKS (Attempt any FOUR questions.)

Each question carries 10 marks. Questions progress from concepts to experiments and reasoning.

Question 5 [10]

- State three main ideas of the kinetic theory of matter concerning particle motion, spacing and attraction. [3]
- Compare solids, liquids and gases with respect to (a) shape, (b) volume and (c) ease of compression. Present your answer in a table. [3]
- Draw labelled particle diagrams for a solid and a gas. Explain how each arrangement accounts for the difference in their compressibility. [4]

Question 6 [10]

- Define melting, freezing and condensation. [3]
- Explain melting using the particle model: describe the energy absorbed, change in particle movement and weakening of the fixed arrangement. [3]
- Draw a change-of-state flow diagram for solid, liquid and gas. Label both directions between solid and liquid, and between liquid and gas. Mark the heat-absorbing and heat-releasing directions. [4]

Question 7 [10]

- Give three differences between evaporation and boiling: temperature, region of occurrence and bubble formation. [3]
- Explain why evaporation cools a liquid in terms of the particles that escape and the energy of those left behind. [3]
- Explain (a) why spreading a wet towel helps it dry faster and (b) why drying is slower on a humid day. Link each answer to evaporation. [4]

Question 8 [10]

A teacher uses the descriptions below as three particle models of the same substance. Read them carefully.

Model P	Model Q	Model R
Closely packed particles in a regular arrangement; vibrate about fixed positions.	Closely spaced particles in an irregular arrangement; slide past one another.	Widely spaced particles moving freely and randomly throughout the container.

- Identify the state represented by P, Q and R. [3]
- Which model represents a substance that (a) fills its entire container, (b) has a fixed shape and (c) has a fixed volume but can flow? [3]
- A student says, "In change P to Q, particles themselves become larger and stop attracting one another." Identify both errors. Give a correct particle explanation of this change. [4]

Question 9 [10]

Equal amounts of water were left for 30 minutes under the conditions shown. All other conditions were kept the same. The results are illustrative experimental data.

Setup	Exposed area	Air movement	Water lost
A	20 cm ²	Still air	2 g
B	60 cm ²	Still air	5 g
C	60 cm ²	Moving air	8 g

- Which pair should be compared to test the effect of surface area? Which setup shows the fastest evaporation? State the evidence for the latter. [3]
- Compare B and C. State the factor changed, give one variable that must be controlled, and explain the difference in water loss. [3]
- Calculate how much more water C lost than A. If each setup began with 25 g of water, find the mass left in B. Explain why the lost water has not ceased to exist. [4]

Question 10 [10]

- Perfume sprayed in one corner of a closed room is later detected in another corner. Name the process and explain it using particle motion and concentration differences. [3]
- A sealed, leak-proof syringe contains air. Its outlet is closed and its plunger is pushed in. Explain what happens to the air volume, particle spacing and number of air particles. [3]
- A cold metal plate held above hot water becomes wet. Identify the change of state and explain the heat transfer. A student calls the visible white mist "water vapour". Correct this description and distinguish the mist from invisible water vapour. [4]