

CHAPTER 01 MATTER IN OUR SURROUNDINGS

(ANSWERS)

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : IX

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains **20** questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Cooking gas is known as LPG (Liquified Petroleum Gas). How can a gas be liquified?
 - (a) when pressure is applied to the gas.
 - (b) when temperature of the gas is increased.
 - (c) when gas is mixed with a liquid substitute.
 - (d) when the force of attraction between particle is reduced.

Ans: (a) High pressure and low temperature brings particles closer.
2. The melting points of four solid A, B, C and D are 380K, 54K, 290K and 1600K. The forces of attraction are in order of
 - a) A < B < C < D
 - (b) B < C < D < A
 - (c) B < C < A < D
 - (d) C < B < A < D

Ans: (c) Higher the melting point, more will be forces of attraction.
3. During summer, water kept in earthen pot becomes cool due to phenomenon of
 - (a) Diffusion
 - (b) Transpiration
 - (c) Distillation
 - (d) Evaporation

Ans: (d) Water comes out through pores, get evaporated which causes cooling.
4. Choose the correct statement out of the following.
 - (a) Conversion of solid into vapours without passing through the liquid state is called vapourization.
 - (b) Conversion of solid into vapours without passing through the liquid state is called sublimation.
 - (c) Conversion of vapours into solid without passing through the liquid state is called freezing.
 - (d) Conversion of solid into liquid is called sublimation.

Ans: (b) Conversion of solid into vapours without passing through the liquid state is called sublimation.
5. Which of the following conditions will increase the rate of evaporation?
 - (a) Increase in temperature of water.
 - (b) Decrease in wind speed.
 - (c) Decrease in surface area of water.
 - (d) Adding sugar to water.

Ans: (a) Higher the temperature, more will be rate of evaporation due to increase in K.E.
6. Latent heat of fusion is amount of
 - (a) heat energy required to change 1 kg solid into liquid completely at its melting point.
 - (b) heat energy required to convert 1 kg solid into liquid at room temperature.
 - (c) heat energy required to change 1 g of solid into liquid completely.
 - (d) heat energy required to change 1 kg of solid into liquid at any temperature.

Ans: (a) Solid changes to liquid at melting point by absorbing latent heat of fusion.

7. The temperature at which vapour pressure of liquid becomes equal to atmospheric pressure is called
(a) melting point. (b) boiling point. (c) ignition temperature. (d) sublimation temperature.

Ans: (b) Liquid changes into vapours completely at boiling point.

8. Which of the following is not correct about evaporation?

- (a) It is surface phenomenon.
(b) It takes place at all temperatures.
(c) It causes cooling as it takes heat from surroundings.
(d) Its rate decreases with decrease in humidity.

Ans: (d) ∵ Its rate increases with decrease in humidity.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

(b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.

(c) Assertion is true but the Reason is false.

(d) Assertion is false but the Reason is true.

9. **Assertion:** In pressure cooker temperature of water becomes more than 100°C.

Reason: Boiling point is directly proportional to pressure acting on liquid.

Ans: (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

10. **Assertion:** We feel more cold after taking bath with hot water.

Reason: Evaporation of hot water takes place faster which causes cooling.

Ans: (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Give reasons for the following:

(i) A liquid generally flows easily.

(ii) Ice at 0°C appears colder to the mouth than water at 0°C. Why?

(iii) Doctors advise to put strips of wet cloth on the forehead of a person having high temperature.

Ans: (i) It is due to less force of attraction between particles in liquids than solids.

(ii) Ice takes latent heat of fusion from mouth to melt and therefore we feel more cold than water at 0°C.

(iii) It is because water absorbs heat from body to get evaporated and causes cooling, i.e. decrease in body temperature.

12. What is matter? Write two properties of solids and two properties of liquids.

Ans: Matter is a substance which has mass and occupies space.

Properties of solids:

(i) They have fixed shape and fixed volume

(ii) These are not compressible.

Properties of liquids:

- (i) They have fixed volume but not shape
- (ii) They can flow from higher level to lower level.

13. “Evaporation causes cooling”. Explain the reason for this effect.

Ans: In evaporation, heat is taken from surroundings to overcome intermolecular force of attraction which causes cooling.

14. (a) Why does the water kept in an earthen pot become cool in summer?

- (b) Convert: 340 K to degree Celsius.

Ans: (a) It is because water comes out through pores which gets evaporated and causes cooling.

$$(b) 340 \text{ K} - 273 = 67^\circ\text{C}$$

15. (a) CO_2 is a gas. Write its two gaseous properties to justify it.

- (b) How can we liquefy a gas?

Ans: (a) (i) It does not have fixed shape. It takes the shape of container.

(ii) It does not have fixed volume. Its volume becomes equal to volume of container.

- (b) We can liquefy gas at low temperature and high pressure.

SECTION – C

Questions 15 to 17 carry 3 marks each.

16. Give reasons for the following:

- (a) Camphor disappears if kept in open air for a few days.

- (b) Wet clothes do not dry easily on a rainy days.

- (c) We sweat more on humid days.

Ans: (a) Camphor has weak inter particle forces of attraction which can be overcome by room temperature and it changes from solid state to vapours directly and disappears.

(b) On rainy day, air is saturated with water vapours, therefore it cannot take more vapours, therefore wet clothes do not dry up easily.

(c) We sweat more on humid days because our sweat does not get evaporated easily due to higher content of water vapours in atmosphere, therefore, we sweat more and feel uncomfortable in coastal areas where humidity is high.

17. Give reasons for the following:

- (a) Why does Ice float on water?

- (b) Why does a gas fill completely the vessel in which it is kept?

(c) Latent heat of evaporation of two liquids A and B is 100 J/kg and 150 J/kg respectively.

Which one can produce more cooling effect and why?

Ans: (a) It is because ice is lighter, i.e. it has lower density than water.

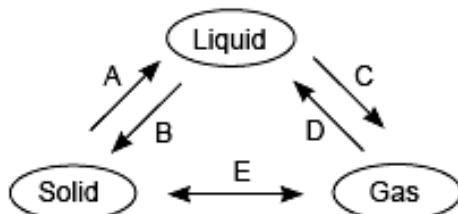
(b) It has very less force of attraction between particles and particles have high kinetic energy.

(c) ‘B’ has more heat of evaporation and will take more heat from the surroundings, therefore, it will cause more cooling.

SECTION – D

Questions 18 carry 5 marks each.

18. Explain the different processes involved in the flowchart given below.



Ans: 'A' is called melting in which solid changes into liquid completely at its melting point
 'B' represents freezing in which liquid changes into solid at freezing point.
 'C' represents boiling (vapourisation) in which liquid changes into gas completely at its boiling point.
 'D' represents condensation in which vapours on cooling form liquid.
 'E' represents sublimation in which solid change into vapours directly on heating and becomes solid again on cooling.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

- 19.** Read the following information and answer the questions based on information and related studied concepts.

Substance – 1. is brittle.

Substance – 2. melts at 5 °C and boils at 150 °C.

Substance – 3. has high melting point of 800 °C.

Substance – 4. has melting point –169 °C and boiling point – 104 °C.



(a) What is physical state of substance – 4 at – 150 °C and – 100 °C?

(b) What is physical state of substance –1 and 3 at room temperature?

(c) What is physical state of substance –2 at 100° and why?

OR

(c) Arrange substances –2, 3, 4 in increasing order of force of attraction. Give reason.

Ans: (a) Substance 4 is liquid at –150 °C and gas at –100 °C.

(b) Substance 1 and 3 are solids at room temperature due to brittleness and high melting point.

(c) It will be in liquid state because its boiling point is 150°C.

OR

(c) $4 < 2 < 3$ is increasing order of force of attraction because substance 3 has high melting point and substance 4 has low melting and boiling point.

- 20.** Read the given passage and answer the questions that follow based on the passage and related studied concepts.

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 strong force of attraction but less than solids, particles can move throughout the liquid. In Gaseous state, particles are far apart with weak force of attraction and are in state of constant random motion. Gases can be easily compressed where as solids and liquids are incompressible.

(a) An inflated balloon with He gas goes to upper atmosphere, what will happen?

(b) When solid changes into vapours directly predict the strength of forces?

(c) Why do we feel more cold after taking bath with hot water?

OR

(c) Why does sea water boils above 100°C?

Ans: (a) In upper atmosphere, external pressure is less, so balloon will expand.

(b) The strength of forces are weaker.

(c) It is because evaporation of hot water is faster which causes cooling.

OR

(c) It is because surface consists of both solute and solvent particles, therefore tendency of solvent changes into vapours decreases.

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