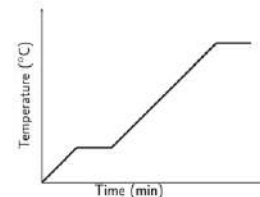
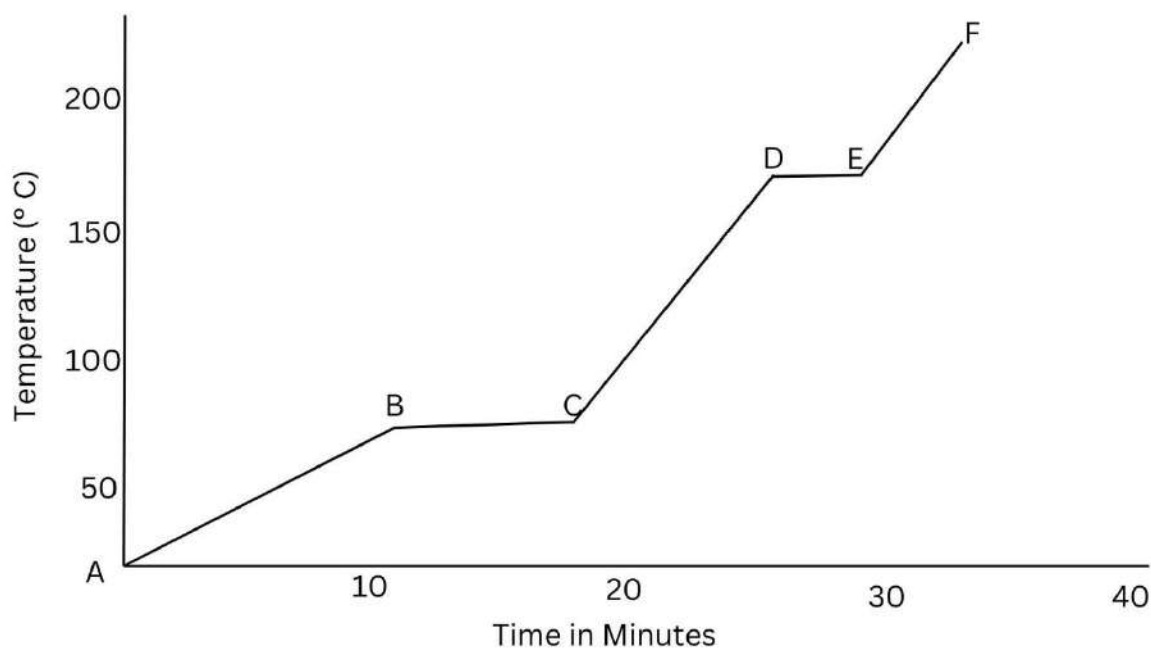


Name \_\_\_\_\_ Date \_\_\_\_\_



## HEATING AND COOLING CURVES QUIZ – Answer Key

1. The graph below shows the heating curve of a substance P starting from 0°C (point A). Use it to answer the following questions:



- a. Determine the melting and boiling point of substance P

**MP=app. 65°C; BP=app. 165°C**

- b. How long did substance P take to melt completely?

**App. 18 minutes**

- c. In what part of the curve were the molecules of substance P farthest apart?

**EF**

- d. In what part of the curve were the molecules of substance P having definite volume but no definite shape?

**BC and CD**

- e. In what part of the curve did the molecules of substance P possess the highest and the lowest kinetic energy respectively?

**Lowest Kinetic energy: A/AB**

**Highest Kinetic energy: EF**

- f. In what part of the curve was substance P in a mixed liquid/gas phase?

**DE**

- g. What is the physical states of substance P at regions marked CD and DE

**CD: liquid**

**DE: liquid/gas**

- h. Is substance P a pure or impure substance? Justify your answer.

**Pure: it has constant melting and boiling points. Impure substances tend to melt and boil over a wide range of temperatures.**

- i. In terms of kinetic energies and particle movement, explain what happens in regions marked AB and BC.

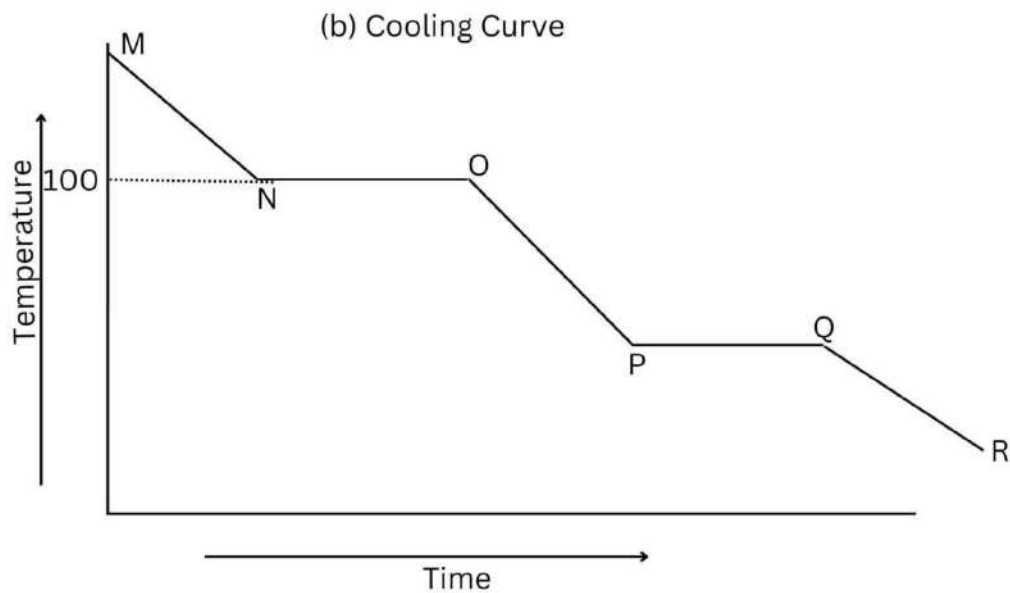
**AB: Particles of substance P acquire higher kinetic energy and move faster**

**BC: Energy absorbed is used to weaken the forces of attraction holding the particles of substance P together**

- j. It took longer time to melt substance P than to evaporate it (assuming a constant source of heat was used). Explain.

**Forces of attraction between particles in solid state are stronger than between particles in liquid state**

2. The graph below represents the cooling curve of water. Use it to answer the questions below:



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- a. Which regions represent the following changes of state?
- Condensation point: **NO**
  - Freezing point: **PQ**
- b. Why does the temperature remain constant at regions NO and PQ?
- NO

**Steam condenses into liquid water. Heat is released during the phase change from gas to liquid.**

- PQ

**Liquid water freezes into ice. Heat is released during the phase change from liquid to solid.**

c. At what region do the molecules of water attain definite shape and define volume?

**PQ and QR**