3 **(a)** Explain why a solid has a fixed shape while a liquid does not have a fixed shape. [2]

movement | vibrate | slide / disorderly

(b) Explain why a solid has a fixed volume while a gas does not have a fixed volume. [2]

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arrange | s v g

focus on packing = distance between particles

3a	Particles of a solid are held together by **very strong forces of attraction**. The forces of attraction between particles of liquid are **weaker** (Reject: weak) compared to those in a solid / Particles of a liquid are held together by **strong forces of attraction**. [1; compare forces of attraction] Hence solid particles **cannot move about freely / can only vibrate at fixed positions**. Liquid particles can are **not in fixed positions** / **slide over one another**. [1; compare movement]	2
3b	Particles of a solid are held together by **very strong forces of attraction**. The forces of attraction between gas particles are **very weak** (accept: weak). [1; compare forces of attraction] Solid particles are **very closely packed** while particles of a gas are **far apart**. [1; compare space between particles]	2

5) Table 9.1 shows the melting and boiling points of some substances.

substance	melting point / °C	boiling point / °C
P	– 100	– 56
Q	– 12	26
R	18	97
S	56	205

(a) Indicate the physical states of each of the substances at 27°C by placing the letters **P**, **Q**, **R** and **S** under the correct headings in the table below. [2]

solid	liquid	gas

(b) Draw the arrangement of particles in substance **P** at – 57 °C and 0 °C respectively. [2]

– 57 °C 0 °C

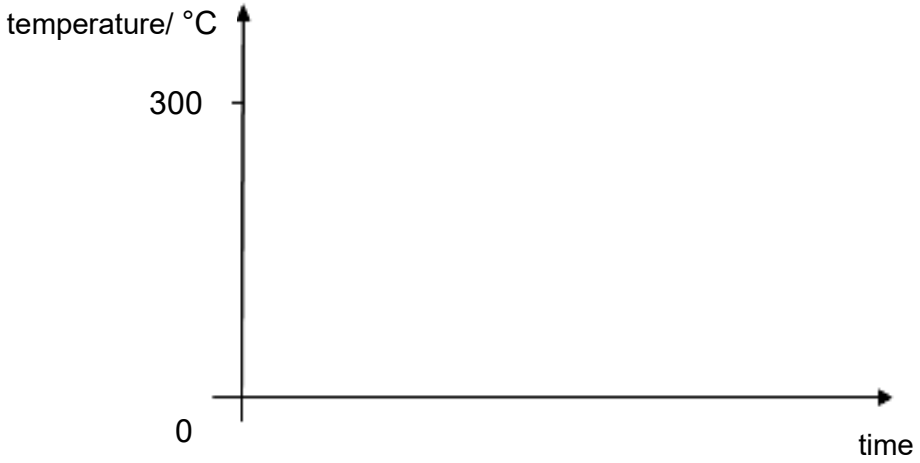
(c) Substance **S** was heated from 100 °C to 180 °C. Predict what would happen to the density of substance **S**. Explain your answer, with reference to its mass and volume.

.....

.....

[2]

(c) On the axes below, sketch the heating curve of substance **C** when it is heated from 0 °C to 300 °C. Indicate on the y-axis the melting and boiling points of substance **C**.



[2]

explain phenomena

(d) When substance **B** at 90 °C is placed in a beaker of ice, its compressibility decreases. Explain why.

2.

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..... [2]

1. explain phenomena

(e) Would you expect the density of substance **A** at 10 °C to be higher, lower or the same as the density at 20 °C? Explain your answer.

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..... [3]