2 The first law of thermodynamics, when applied to a system, can be expressed as:

$$\Delta U = q + w$$

where ΔU is the increase in internal energy of the system,
q is the heat supplied to the system and
w is the work done on the system.

State and explain, in terms of the first law of thermodynamics, the change, if any, in the internal energy

(a) of the water in an ice cube when ice melts, at atmospheric pressure, to form a liquid without any change of temperature,

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……[3]

(b) of the gas in a tyre when the tyre bursts so that the gas suddenly increases in volume. Assume that the gas is ideal.

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……[3]