4 **(a)** Explain what is meant by an *ideal* gas.

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.....[2]

(b) A cylinder contains 3.16 mol of an ideal gas at a pressure of 4.81×10^5 Pa and a volume of 1.20×10^4 cm^3. Heat is removed for a duration of 12 minutes at constant pressure such that its temperature decreased by 110 K.

(i) Calculate the initial temperature of the gas.

initial temperature = ... K [1]

(ii) Determine the new volume of the gas after heat is removed.

volume of the gas = ... m^3 [2]

(iii) Determine the change in internal energy of the gas.

change in internal energy = ... J [1]

(iv) Determine the rate of heat loss.

rate of heat loss = ... W [3]

[Total: 9]