Practice Question Set For A-Level
Subject : Physics
Paper-2 Topic: Thermal Physics

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

The pressure exerted by an ideal gas in a container of volume 1.2×10^{-5} m^3 is 1.5×10^5 Pa at a temperature of 50°C.

(a) Calculate the number of molecules of gas in the container.

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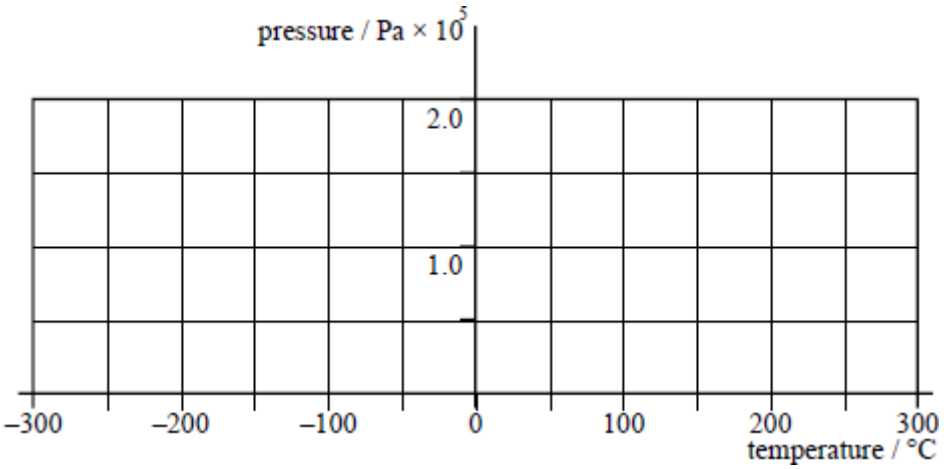
(3)

(b) The pressure of the gas is measured at different temperatures whilst the volume of the container and the mass of the gas remain constant. Draw a graph on the grid to show how the pressure varies with the temperature.



(3)

(c) The container described in part (a) has a release valve that allows gas to escape when the pressure exceeds 2.0×10^5 Pa. Calculate the number of gas molecules that escape when the temperature of the gas is raised to 300°C.

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(3)

(Total 9 marks)

Q2.

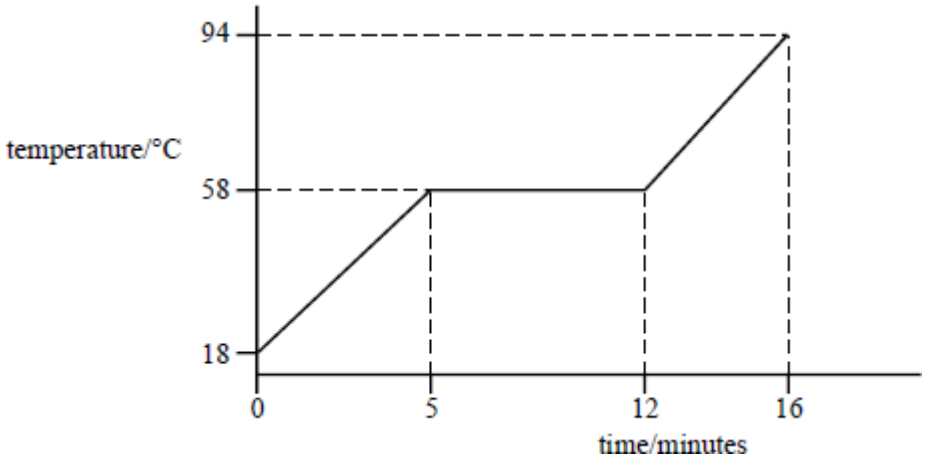
(a) Explain what is meant by

(i) the specific heat capacity of water,

(ii) the specific latent heat of fusion of ice.

(4)

(b) A sample of solid material, which has a mass of 0.15 kg, is supplied with energy at a constant rate. The specific heat capacity of the material is 1200 J kg^{-1} K^{-1} when in the solid state. During heating, its temperature is recorded at various times and the following graph is plotted.



Assume there is no heat exchange with the surroundings.

(i) Show that energy is supplied to the material at a rate of 24 W.

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(ii) Calculate the specific latent heat of fusion of the material.

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(iii) Calculate the specific heat capacity of the material when in the liquid state.

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(6)

(Total 10 marks)

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