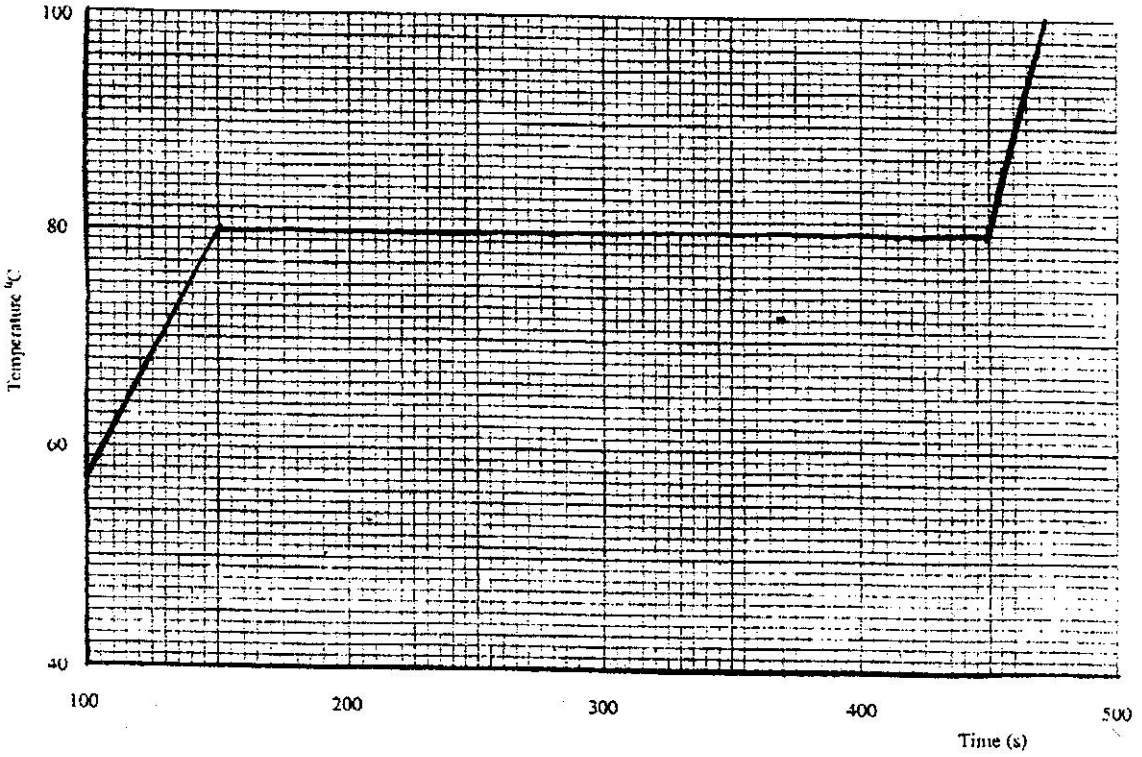
Question 21 and 22

A certain powder of mass 0.10 kg was heated in a container by an electric heater rated 50 W for sometime. The graph below shows the variation of the temperature of the powder with time. Use this information and the graph to answer questions 21 and 22.



21 Determine the quantity of heat supplied by the heater from the time the powder starts to melt to the time it has all melted. (3 marks)

22 Determine the specific latent heat of fusion of the powder assuming the container absorbs negligible amount of heat. (3 marks)

Candidates were expected to understand (interpret) the temperature versus time graph provided ie to:-

(a) identify the sections of the graph representing the three phases of the heating process – solid, liquid and vapour.
(b) determine the time taken for the heat to melt the powder.
(c) calculate energy dissipated by the heater at 50 W.

In question 22 candidates were required to use the amount of heat found in question 21 above to determine the specific latent heat of fusion of the powder using either their knowledge of the definition or H = ML