6 Mark Style Heat Calculation Questions for GCSE Physics

1. A 1200 g block of ice is at 0°C. How much energy is needed to melt it and then heat the resulting water to 100°C? The specific latent heat of fusion of ice is 334,000 J/kg, and the specific heat capacity of water is 4,200 J/kg°C.

[4 marks]

2. A 3 kg block of aluminum is heated from 25°C to 660°C (its melting point), and then it is completely melted. The specific heat capacity of aluminum is 900 J/kg°C, and the specific latent heat of fusion is 397,000 J/kg. Calculate the total energy required to heat the block and melt it completely.

[4 marks]

3. How much energy is required to convert 1.5 kg of ice at -10°C to water vapour at 100°C? The specific heat capacity of ice is 2,100 J/kg°C, the specific latent heat of fusion of ice is 334,000 J/kg, the specific heat capacity of water is 4,200 J/kg°C, and the specific latent heat of vaporization of water is 2,260,000 J/kg.

[5 marks]

4. A 1.2 kg block of a material is heated from 20°C to its melting point of 800°C. It is then melted completely, requiring a total of 850,000 J of energy. The specific heat capacity of the material is 400 J/kg°C. Calculate the specific latent heat of fusion of the material.

[6 marks]

5. A 600 g block of ice at -5°C is heated until 250,000 J of energy is supplied. If the specific heat capacity of ice is 2,100 J/kg°C, the specific latent heat of fusion of ice is 334,000 J/kg, and the specific heat capacity of water is 4200 J/kg^{o}C, calculate the final temperature of the water.

[6 marks]

6. A 2 kg block of ice at -10°C is heated until 167,000 J of energy is supplied. The specific heat capacity of ice is 2,100 J/kg°C, and the specific latent heat of fusion of ice is 334,000 J/kg. How much of the ice is remaining after this energy is supplied?

[6 marks]