

QUESTION 1

1. The following diagram shows a cross-section of a building facade. The facade is composed of a concrete slab, a brickwork section, and a window unit. The concrete slab is 200 mm thick, the brickwork is 100 mm thick, and the window unit is 150 mm thick. The facade is exposed to an outdoor air temperature of 10°C and an indoor air temperature of 20°C. The thermal conductivity of the concrete is 1.7 W/mK, the thermal conductivity of the brickwork is 0.6 W/mK, and the thermal conductivity of the window unit is 1.0 W/mK. The thermal resistance of the window unit is 0.18 m²K/W. The thermal resistance of the brickwork is 0.167 m²K/W. The thermal resistance of the concrete slab is 0.118 m²K/W. The thermal resistance of the facade is 0.285 m²K/W. The heat transfer coefficient of the facade is 3.51 W/m²K. The heat loss through the facade is 35.1 W/m².

