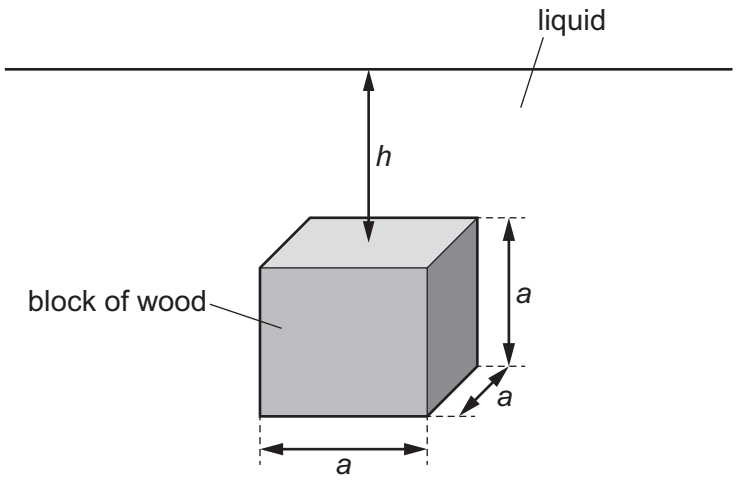
15 A block of wood of density ρ_w has sides of length a.

The block is immersed in a liquid of density ρ_L. The top surface of the block is at a depth h below the surface of the liquid.



The acceleration of free fall is g.

What is the upthrust acting on the block from the liquid?

A $\rho_L a^3 g$ **B** $\rho_w a^3 g$ **C** $\rho_L hg$ **D** $\rho_L ag$

16 A technical article about diesel engines expresses the energy available from diesel fuel both as $41.8\,\text{MJ kg}^{-1}$ and as $34.9\,\text{GJ m}^{-3}$.

What is the density of diesel fuel?

A $8.35 \times 10^2\,\text{kg m}^{-3}$

B $1.20 \times 10^3\,\text{kg m}^{-3}$

C $8.35 \times 10^5\,\text{kg m}^{-3}$

D $1.20 \times 10^6\,\text{kg m}^{-3}$

17 What is meant by the efficiency of a system?

A the difference between the useful energy output from the system and the total energy input

B the difference between the useful energy output from the system and the wasted energy output

C the ratio of the useful energy output from the system to the total energy input

D the ratio of the useful energy output from the system to the wasted energy output