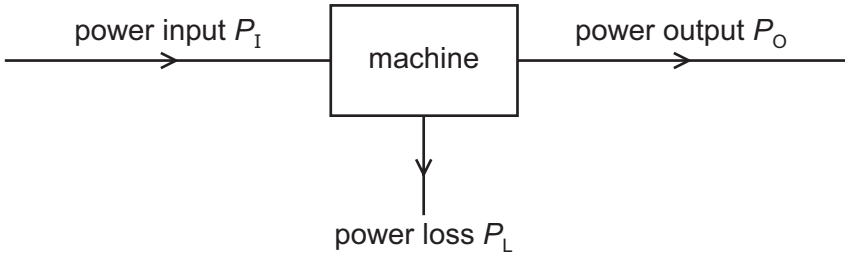
16 Power is transferred through a machine as shown.



What is the efficiency of the machine?

A $\frac{P_I}{P_O + P_L}$ **B** $\frac{P_L}{P_I}$ **C** $\frac{P_L}{P_O}$ **D** $\frac{P_O}{P_I}$

17 A piston in a gas supply pump has an area of 400 cm^2. The pump moves the gas against a fixed pressure of 3000 Pa.

During part of its stroke, the piston moves a distance of 25 cm in one direction. How much work is done by the piston during this movement?

A 30 J **B** 3.0×10^3 J **C** 3.0×10^5 J **D** 3.0×10^7 J

18 A stone is projected vertically upwards from the ground at an initial speed of 15 $m\,s^{-1}$. Air resistance is negligible.

What is the maximum height reached by the stone?

A 0.76 m **B** 11 m **C** 23 m **D** 110 m

19 A turbine at a hydroelectric power station is situated 30 m below the level of the surface of a large lake. The water passes through the turbine at a rate of 340 m^3 per minute.

The overall efficiency of the turbine and generator system is 90%.

What is the output power of the power station? (The density of water is 1000 $kg\,m^{-3}$.)

A 0.15 MW **B** 1.5 MW **C** 1.7 MW **D** 90 MW