16 A concrete cube of side 0.60 m and uniform density 2.0×10^3 kg m^{-3} is lifted 5.0 m vertically by a crane.

What is the change in potential energy of the cube?

A 2.2 kJ   **B** 21 kJ   **C** 59 kJ   **D** 450 kJ

17 The force resisting the motion of a car is taken as being proportional to the square of the car's speed. The magnitude of the force at a speed of 20 m s^{-1} is 800 N.

What effective power is required from the car's engine to maintain a steady speed of 40 m s^{-1}?

A 32 kW   **B** 64 kW   **C** 128 kW   **D** 512 kW

18 The data below are taken from a test of a petrol engine for a motor car.

power output	150 kW
fuel consumption	20 litres per hour
energy content of fuel	40 MJ per litre

Which expression will evaluate the efficiency of the engine?

A $\dfrac{150 \times 10^3}{40 \times 10^6 \times 20 \times 60 \times 60}$

B $\dfrac{150 \times 10^3 \times 60 \times 60}{20 \times 40 \times 10^6}$

C $\dfrac{150 \times 10^3 \times 40 \times 10^6 \times 20}{60 \times 60}$

D $\dfrac{150 \times 10^3 \times 20}{40 \times 10^3 \times 60 \times 60}$

Space for working