

### Answer on Question #57812-Physics-Mechanics

Petrol engine output of 20kw and uses 4.5kg of fuel for each hour of running. The energy given out when 1kg of petrol is burnt  $4.8 \times 10^7 \text{ J}$

What is efficiency of petrol engine?

#### Solution

The power that producing when petrol burning is

$$W_{in} = \frac{4.5 \cdot 4.8 \cdot 10^7 \text{ J}}{1 \text{ hour}} = \frac{4.5 \cdot 4.8 \cdot 10^7 \text{ J}}{3600 \text{ s}} = 60 \text{ kW}.$$

The efficiency of petrol engine is

$$\eta = \frac{W_{out}}{W_{in}} = \frac{20 \text{ kW}}{60 \text{ kW}} = \frac{1}{3}.$$

**Answer:**  $\frac{1}{3}$ .