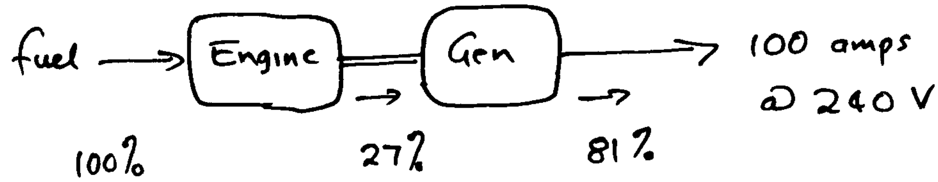
Qu. 7

Maximum output (assume 1 hour running time)



$100 \times 240 \times 1$ Wh

$\frac{29.63}{0.27} = 109.74$ kWh $\frac{24}{0.81} = 29.63$ kWh $= 24$ kWh

1 kWh = 3.6 MJ

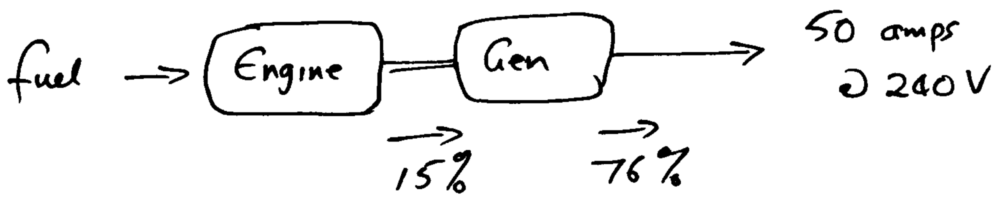
$\therefore$ 109.74 kWh = 395 MJ

fuel $= \frac{395}{44.22} = 9.14$ kg

$\frac{9.14}{0.74} = 12.35$ litre which costs 963.5 p

$\therefore$ Energy cost is $\frac{963.5}{24}$ = **40.15 p/kWh**

These calculations can then be repeated for half maximum output giving:



105.26 kW 15.79 kW 12 kWh

= 378.94 MJ

8.767 kg fuel

11.848 litre

924 pence $\frac{924}{12}$ = **77.0 p/kWh**

ie. energy cost almost doubles — avoid part-load operation as far as possible