

Date
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B.Sc. Part - I

PHYSICS HONOURS & Subsidiary

Topic :- Numerical Problems based
on Carnot Engine

Ex :- \rightarrow Calculate the efficiency of
a Carnot's Engine between steam
point and ice point.

Solution \rightarrow Here, Steam point,

$$T_1 = 100^\circ\text{C} = 100 + 273 = 373\text{K}$$

$$\text{ice point, } T_2 = 0^\circ\text{C} = 0 + 273 = 273\text{K}$$

As,

$$\eta = 1 - \frac{T_2}{T_1}$$

$$\therefore \eta = 1 - \frac{273}{373} = \frac{100}{373}$$

$$= \frac{100}{373} \times 100\% = 26.81\% \quad \underline{\hspace{1cm}}$$

EX:-2) A Carnot Engine intakes steam at 200°C and after doing work, exhausts it to a sink at 100°C . Calculate the % age of heat which is utilized for doing work.

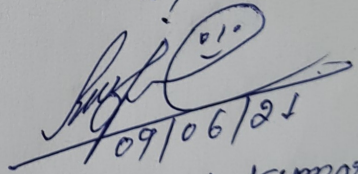
Solution:- Here, $T_1 = 200^{\circ}\text{C} = 200 + 273 = 473\text{ K}$

$$T_2 = 100^{\circ}\text{C} = 100 + 273 = 373\text{ K}$$

$$\eta = 1 - \frac{T_2}{T_1} = 1 - \frac{373}{473} = \frac{100}{473}$$

$$\eta = \frac{100}{473} \times 100\%$$

$$= 21.14\% \quad \underline{A}$$

BY

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