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B.Sc. Part - I
PHYSICS HONOURS & Subsidiary

Topic :- Numerical Problems based on carnot Engine

EX :- ⇢ Calculate the Efficiency of a carnot's Engine between Steam point and ice point.

Solution :⇢ Here, Steam point,

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

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

As,

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

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

$$= \frac{100}{373} \times 100\% = 26.81\%$$ Ans.

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, $T_1 = 200°C = 200 + 273 = 473\ K$

$$T_2 = 100°C = 100 + 273 = 373\ K$$

$$\eta = 1 - \frac{T_2}{T_1} = 1 - \frac{273}{473} = \frac{100}{473}$$

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

$$= 21.14\%$$ Ans.

By

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