

Assignment

12.7 - 1

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Q 12.7.1: A $100\ \Omega$ resistor is connected to $220V$, $50Hz$ AC supply.

- (1) What is the rms value of current in the circuit?
- (2) What is the net power consumed over a full cycle?

Solution:

Symbol	Value	Description
V_{rms}	$220V$	rms value of voltage
I_{rms}	$\frac{V_{rms}}{R}$	rms value of current
P_{avg}	$V_{rms} \cdot I_{rms}$	Average power consumed per cycle
R	100Ω	Resistance

TABLE 0

VARIABLE DESCRIPTION

1)

$$\begin{aligned}
 I_{rms} &= \frac{V_{rms}}{R} \\
 &= \frac{220V}{100\Omega} \\
 &= 2.2A
 \end{aligned}$$

2)

$$\begin{aligned}
 \text{Net power consumed} &= \frac{V^2}{R} \\
 &= \frac{220^2}{100} \\
 &= 484W
 \end{aligned}$$