

**TOPIC**

Electricity and Magnetism

**QUESTION**

The electrical resistance of a wire is

- (A) proportional to the square of the length of the wire.
- (B) inversely proportional to the resistivity of the wire material
- (C) inversely proportional the square of the radius of the wire.
- (D) inversely proportional to the circumference of the wire.

**SOLUTION**

Since the resistance of the wire is given by

$$R = \frac{\rho L}{A}$$

where

$\rho$  = resistivity of the wire material,

$L$  = length of wire,

$A$  = cross-sectional area of wire.

Since

$$A = \pi r^2$$

where

$r$  = radius of the wire

$$R = \frac{\rho L}{\pi r^2}$$

So the resistance is inversely proportional to the square of the radius of the wire.

**ANSWER**

(C)

**CONTRIBUTOR**

*This question of the day was provided by the courtesy of Professor [Autar Kaw](#) of the [University of South Florida](#) from the book [Fundamentals of Engineering Examination Sample Questions General Engineering](#).*