

Foundations of Analog and Digital Electronic Circuits

Exercise and Problem Solutions

Henrik Samuelsson
henrik.samuelsson@gmail.com

About

This is my personal solutions to exercises and problems from the book Foundations of Analog and Digital Electronic Circuits. Very much appreciated if you mail me if you find errors in the solutions. My mail address can be found above this section.

1. Assume a 5k and a 10k resistor.
 - (a) The combined resistance if connecting these resistors in series is calculated by adding the resistances.

$$R = R_{5k} + R_{10k} = 5k + 10k = 15k$$

- (b) The combined resistance if connecting these resistors in parallel can be calculated in two different ways.

$$R = \frac{R_{5k}R_{10k}}{R_{5k} + R_{10k}} = \frac{5k \times 10k}{5k + 10k} = 3.3k$$

$$R = \frac{1}{\frac{1}{R_{5k}} + \frac{1}{R_{10k}}} = \frac{1}{\frac{1}{5k} + \frac{1}{10k}} = \frac{1k}{0.2 + 0.1} = 3.3k$$

2. We shall calculate the power dissipated when connecting a 12V car battery across a 1 ohm resistor.

Ohm's law gives the current that will flow through the resistor.

$$I = \frac{V}{R} = \frac{12}{1} = 12A$$

The dissipated power is calculated by multiplying the voltage across the resistor with the current that flows through it.

$$P = VI = 12 \times 12 = 144W$$