

Answer on Question 77245, Physics, Other

Question:

3 capacitors $2 \mu F$, $5 \mu F$, $100 \mu F$ are connected in series and parallel. Find the equivalent capacitance in each case?

Solution:

(a) We can find the equivalent capacitance of the three capacitors connected in series from the formula:

$$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3},$$

$$C_{eq} = \frac{1}{\frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}} = \frac{1}{\frac{1}{2 \mu F} + \frac{1}{5 \mu F} + \frac{1}{100 \mu F}} = 1.41 \mu F.$$

(b) We can find the equivalent capacitance of the three capacitors connected in parallel from the formula:

$$C_{eq} = C_1 + C_2 + C_3 = 2 \mu F + 5 \mu F + 100 \mu F = 107 \mu F.$$

Answer:

(a) $C_{eq} = 1.41 \mu F$.

(b) $C_{eq} = 107 \mu F$.

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