Capacitors (44:30)

Describe the basic purpose and construction of a capacitor and draw the schematic symbol of a capacitor.

Describe the basic units of capacitance and means of calculating capacitance.

Define the amount of charges in 1 Coulomb (1C).

Determine the capacitance a capacitor with 6.24×10^{12} electrical charges at 1V.

Determine the quantity of charges stored in the above capacitor at an increased voltage of 25V.

Determine the quantity of charges stored in a 4.7uF capacitor at 25V.

Identify the hydraulic component most commonly associated with capacitors.

Describe the basic role of a capacitor in a buck chopper.

Describe the relationship of size and capacitance for capacitors of similar construction.

Describe basic behavior of electrical charges.

Describe the state of charges in a discharged capacitor.

Describe the state of charges in a discharged capacitor.

Describe the relationship of charge imbalance and voltage.

Describe the electrostatic field between the plates of a charged capacitor and identify the units used to measure the electrostatic field strength.

Describe the relationship of charge, voltage and distance with electrostatic field strength.

Describe the breakdown strength of a dielectric material and identify the consequences of exceeding it.

Identify how area of the capacitor plates affects capacitance.

Define permittivity.

Identify the influence of a dielectric in a capacitor.

Describe the capacitor construction formula. (NOTE: permittivity should use the symbol ϵ not μ)

Identify the permittivity of free space and describe relative permittivity.

Identify the relative permittivity of some common capacitor dielectrics.

Describe the area of the plates, dielectric employed, and distance between the plates for a capacitor with extremely high capacitance.

Determine the capacitance of a mica filled capacitor with square plates having a side length of 2.54cm, separated by a distance of 1mm.

Determine the capacitance of the above capacitor when tantalum is employed as the dielectric.

Determine the capacitance of a tantalum filled capacitor with plates 5cm by 15cm, separated by a distance of 0.5mm.

Determine the capacitance of the above capacitor in units commonly employed by capacitor manufacturers.

Determine the dielectric employed in a 128pF capacitor with circular plates having a diameter of 0.7mm diameter separated by 0.2mm

Determine the capacitance of 0.1uF, .068uF, and 1800pF capacitors in units of nF.

Identify which capacitor presents a capacitance of 33nF capacitor from the following options: 3.3pf, 33pF, 330pF, 3300pf, .033uF, .33uF, 3.3uF, 33uF, 330uF, 3300uF.

Differentiate between non-polarized and polarized capacitors. List techniques polarized capacitor manufacturers employ to designate the terminal reserved for lower potential.

Describe the industry accepted standard of capacitor labeling

Identify the tool used to measure inductance, capacitance, and resistance and describe its basic operation and safety precautions when measuring capacitors.

Identify the formulas used to determine the total capacitance of series and parallel capacitors.

Compare and contrast series and parallel capacitor calculations with series and parallel resistor calculations.

Calculate the total capacitance of a series combination of two 22uF capacitors.

Calculate the total capacitance of a series combination of a 2.7uF, 3.9uF, and 6.8uF capacitor.

Calculate the total capacitance of a series combination of two 820pF capacitors.

Calculate the total capacitance of a series combination of a 0.12uF and 0.56uF capacitor.

Calculate the total capacitance of a parallel combination of a 4700pF and 3300pF capacitor.

Calculate the total capacitance of a series-parallel combination of a 39uF, a 15uF, and a 6.8uF capacitor.

Describe how current flows "through" a capacitor.

Describe when current "through" a charging capacitor stops.

Describe when current "through" a discharging capacitor stops.