SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A++ Grade

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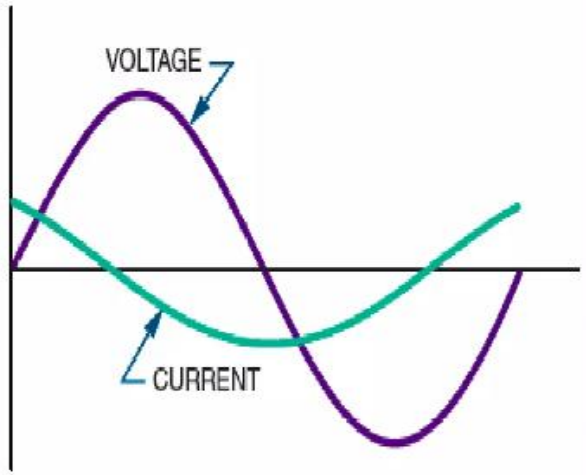
19EET103 / ELECTRIC CIRCUITS AND ELECTRON DEVICES

AC CIRCUITS

capacitive Elements

Capacitors in AC Circuits



the out-of-phase relationship between the current and the voltage in a capacitive AC circuit. The current leads the applied voltage.

- Capacitive reactance
  - Opposition a capacitor offers to the applied AC voltage
  - Represented by X_c
  - Measured in ohms

- Formula for capacitive reactance:

$$X_C = \frac{1}{2\pi fC}$$

Where: π = pi, the constant 3.14

f = frequency in hertz

C = capacitance in farads

Applications of Capacitive Circuits

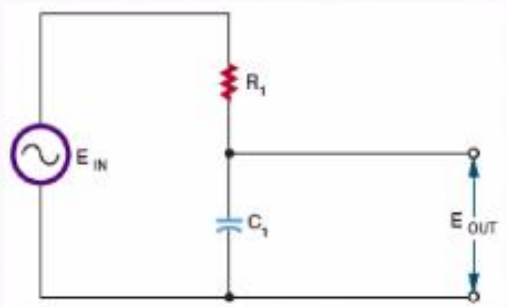


Figure 15-2. RC low-pass filter.

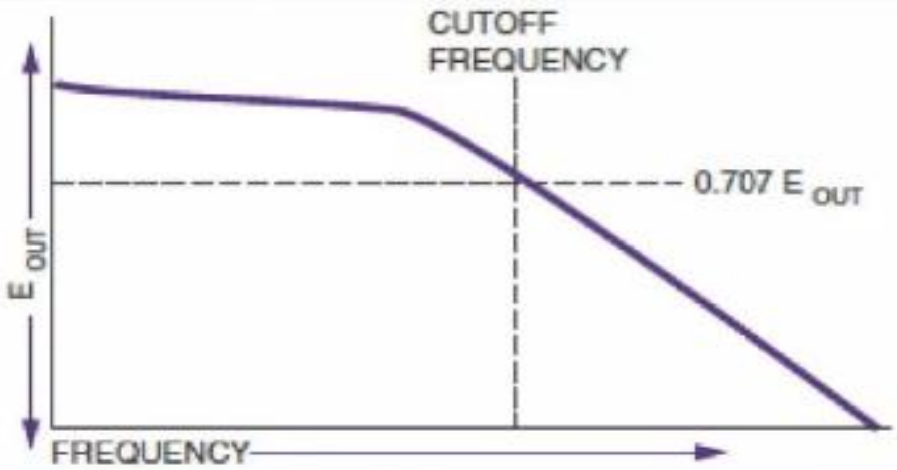


Figure 15-3. Frequency response of an RC low-pass filter.

Application of capacitive circuit

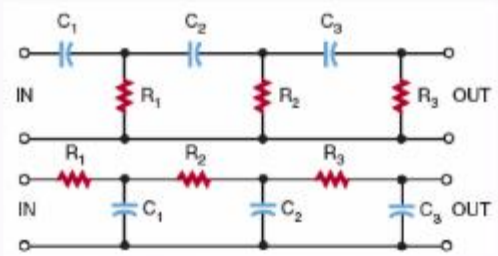


Figure 15-10. Cascaded RC phase-shift networks.

Summary

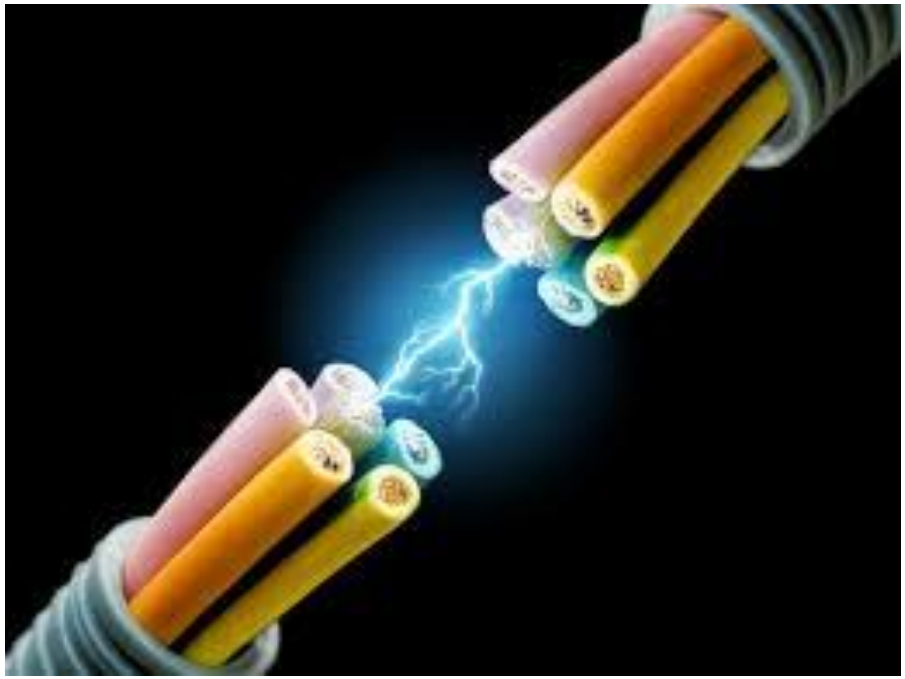
- When an AC voltage is applied to a capacitor, it gives the appearance of current flow
- The capacitor charging and discharging represents current flow
- The current leads the applied voltage by 90 degrees in a capacitive circuit

Summary (cont'd.)

- Capacitive reactance is the opposition a capacitor offers to the applied voltage
- Capacitive reactance is a function of the frequency of the applied AC voltage and the capacitance:
- RC networks are used f ɔling, and phase shifting

$$X_C = \frac{1}{2\pi fC}$$

RECAP….



…THANK YOU