**A.**

\* They are used enable radio receivers to only "see" the desired signal while rejecting all other signals (assuming the other signals have different frequency content).

\*They are used to eliminate undesired high frequencies (i.e., noise) that are present on AC input lines. Additionally, filters are used on a power supply's output to reduce ripple.

\*It is used as a crossover network is a network of filters used to channel low-frequency audio to woofers, mid-range frequencies to midrange speakers, and high-frequency sounds to tweeters.

**B.**

*A 100V Amplitude was selected with a frequency of 1Hz for the Sine Wave Source.*

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**C.**

The cut-off frequency is calculated by F= ½\*(pi\*R\*C)

When R= 0.005Ω and C= 0.01F

F= 0.5\*pi\*0.005\*0.01=3189.099 Hz

**D.**

The transfer function equation for the circuit is given as

(1/RC)/(S + 1/RC)

When R= 0.005Ω and C= 0.01F

Transfer Fcn=(1/0.005\*0.01)/(S + (0.005\*0.01))= (20000)/(s+ 20000)



1. *If two signals of 5 KΩ and 2 KΩ are pass through the filter at different intervals. Discuss your observation*

When the signal of 5 KΩ is passed through the filter, the following result is obtained**:**

The transfer function equation for the circuit is given as

(1/RC)/(S + 1/RC)

When R= 5000Ω and C= 0.01F

Transfer Fcn=(1/5000\*0.01)/(S + (5000\*0.01))= (0.02)/(s+ 0.02)

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*Observations***:** The signal is tuned to 3.869 ohms

*When the signal of 2K ohms is passed through the filter the following results are obtained***:** The transfer function equation for the circuit is given as

(1/RC)/(S + 1/RC)

When R= 2000Ω and C= 0.01F

Transfer Fcn=(1/2000\*0.01)/(S + (2000\*0.01))= (0.05)/(s+ 0.05)

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***Observations*:** The signal is tuned to 9.266 ohms