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**MATRIC NO: 17/ENG04/071**

**DEPARTMENT:ELECTRICAL ELECTRONICS**

**ENG 342**

* Active filters are used in communication systems for suppressing noise, to isolate a communication of signal from various channels to improve the unique message signal from a modulated signal
* These filters are used in instrumentation systems by the designers to choose a required frequency apparatus and detach unwanted ones.
* These filters can be used to limit the analog signal’s bandwidth before altering them to digital signals.
* Analog filters are used in audio systems by engineers to send various frequencies to various speakers. For example, in the music industry, record & playback applications are needed to control the frequency components.
* Active filters are used in biomedical instruments to interface psychological Sensors with diagnostic equipments & data logging.
* **They are used in signal processing circuits and data processing:**

Filters are used to separate signals that have been combined and also restoration of signals that have been distorted in some way and it helps to analyze data better.

b) ****

**The low pass filter design**

c) Cut off frequency

Fc = ½ pi\* R\*C

R=0.005ohms

C=0.01F

Fc = `1/2\*pi\*0.005\*0.01

Fc = 3183.098Hz

D) amplitude-50

Step size – 0.00005







**The output**

E) 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)

It was observed that the signal attenuated to 3.869ohms

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)

It was observed that the Signal attenuated to 9.266ohms