BANDPASS FILTER DESIGN IN SIMULINK:

Step 1: We design the basic RLC circuit of a bandpass filter by following the below schematic and putting the values of RLC as:

CONSTANTS:

R = 1000 Ω

L = 27 mH

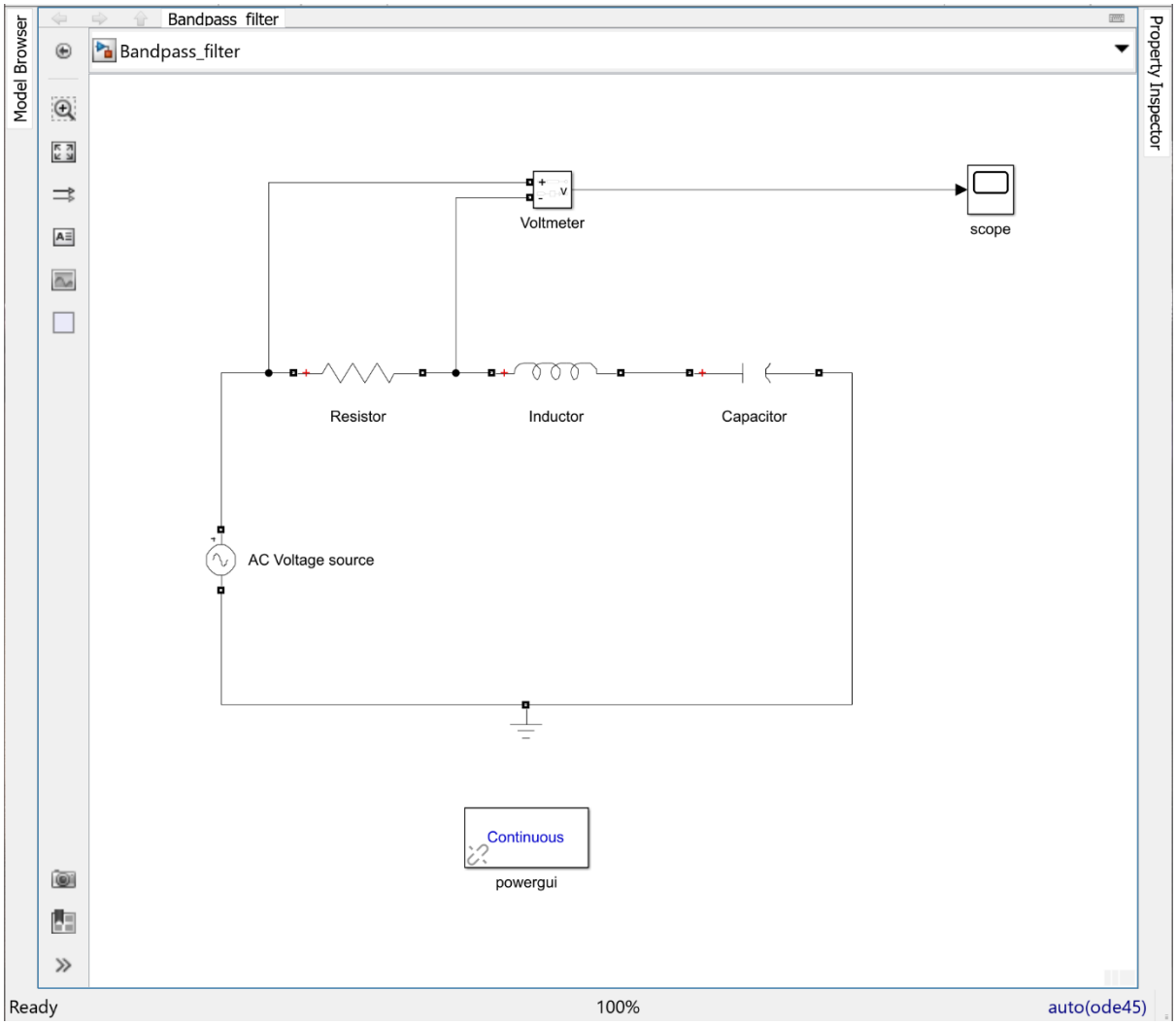
C = 0.047 μF

AC Voltage Peak Amplitude = 10 V

VARIABLES:

AC Voltage Frequency

SCHEMATIC:

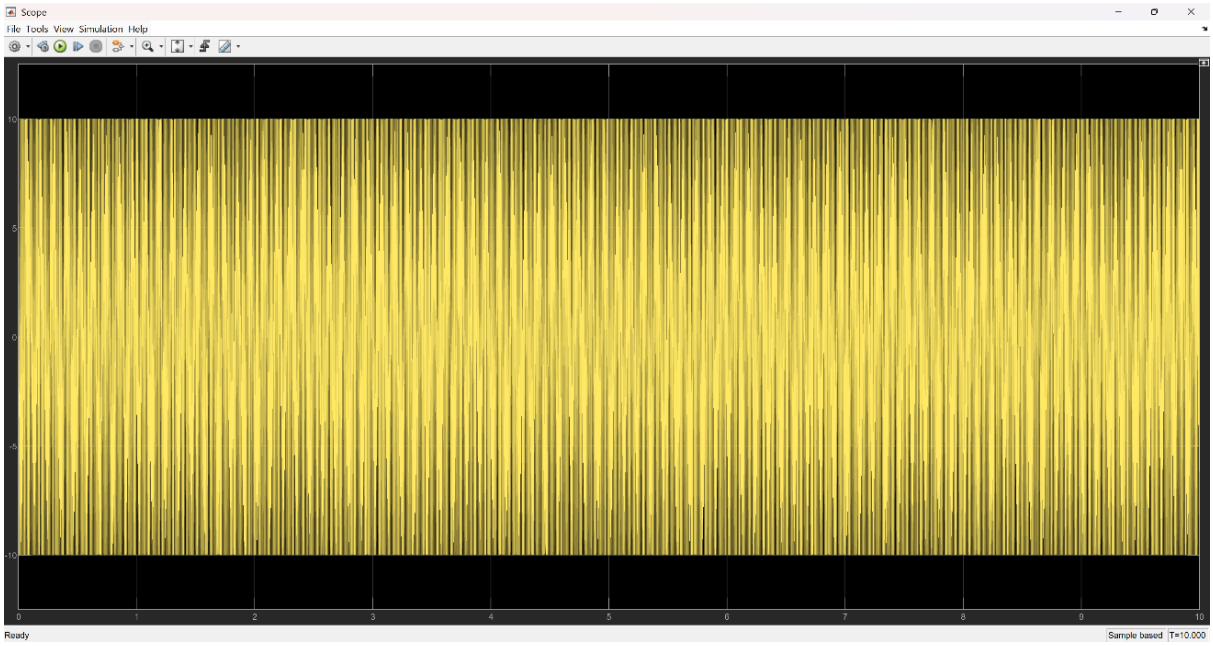


NOTE: Make sure you have ‘Simscape Electrical Library’ installed as an Add-On in Simulink

CALCULATION OF RESONANT FREQUENCY IN MATLAB:

```
Command Window
>> L=0.027

L =

    0.0270

>> C=0.047*10^-6

C =

   4.7000e-08

>> f=1/(2*pi*sqrt(L*C))

f =

   4.4678e+03

fx >>
```

Step 2: Once we run the model, by putting in different values for AC Voltage Frequency, we get the following results: (i) Peak Voltage [10 V]



(ii) Final results:

AC Voltage Source Frequency [Hz]	Voltage [V]
1000	0.47
2000	1.1
3000	2.4
3500	3.7
4000	6.2
4667	**10**
5000	6.5
6000	3.1
8000	1.5
10000	1.1
15000	0.65
16000	0.03