University of Malta  
Department of Communications and Computer Engineering  

Laboratory session 2: Amplifier Gain and Frequency Measurements  

Name: _____________________  
Date: _____________________  

Objective: In this experiment an amplifier is characterized in the frequency domain. The amplifier available operates within the audio range.  

Experiment 1: Familiarization with equipment  

1. Set the frequency generator range to 10 kHz and the amplitude at the output port to 200 mV peak-to-peak.  
2. Set the output waveform to that of a sine-wave  
3. Connect the output of the signal generator to channel 1 of the oscilloscope.  
4. Set the oscilloscope’s channel 1 amplitude scale to a suitable value.  
   
   Your chosen value is __________  

5. Set the oscilloscope’s time base to a suitable value such that you can view at least two cycles of the sinusoid.  
   
   Your chosen value is __________  

6. Set the trigger to channel 1.  
7. Read the amplitude from the oscilloscope __________  
8. Read the frequency from the oscilloscope __________  

9. Sketch the waveform
10. Set the output waveform to type triangle and observe the change on the oscilloscope. Sketch the waveform.

11. Set the output waveform to square wave and observe the change on the oscilloscope. Sketch the waveform.

Experiment 2: Characterisation of the amplifier.

1. Connect the input port of the amplifier to the output of the signal generator and to channel 1 of the oscilloscope. Connect the output of the amplifier to channel 2 of the oscilloscope and the power supply to the 15 V point.
2. Set the power supply to 15 V.
3. Set the output of the signal generator to 1 V peak-to-peak.
4. Vary the frequency (sine-wave) from 2 kHz to 18 kHz in steps of 0.5 kHz.
5. For each frequency read the output voltage \( V_o \).
6. Calculate the voltage gain \( = \frac{V_o}{V_i} \)
7. Calculate the power gain \( = (\text{voltage gain})^2 \)
8. Plot power gain versus frequency.
9. Calculate the 3dB power bandwidth (1/2 power bandwidth).

Result is ________________________________