Universiti Malaysia PAHANG
Engineering • Technology • Creativity

FACULTY OF ENGINEERING TECHNOLOGY

PRACTICAL TEST 1

COURSE	:	**ELECTRICAL FUNDAMENTALS AND CIRCUIT ANALYSIS II LABORATORY**
COURSE CODE	:	**BTE 2132**
LECTURER	:	**NOOR ZAIHAH BINTI JAMAL**
DATE	:	**NOVEMBER 2016**
DURATION	:	**1 HOUR**
SESSION/SEMESTER	:	**SESSION 2016/2017 SEMESTER 1**
PROGRAM	:	**BTE**
NAME	:	_____
SECTION	:	_____
ID NUMBER	:	_____

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of **ONE (1)** question only.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of five (5) printed pages including front page.

QUESTION 1

Equipment:

- Oscilloscope
- Function generator

Component:

- Resistor: 330Ω
- Capacitor: 0.47μF

Procedures:

1. Using the formula given, calculate the cutoff frequencies (in radians per second and in hertz). Record the values in table 1.

$$\omega_C = \frac{1}{\tau} = \frac{1}{RC}$$

$$f_C = \frac{\omega_C}{2\pi} = \frac{1}{2\pi RC}$$

ω_C	rad/s
f_C	Hz

Table 1

2. Assemble the given circuit as in in fig. 1
3. Connect 2.0Vp (4.0Vp-p) at a frequency of *f* = 100Hz as input to the Ch1 of the oscilloscope.

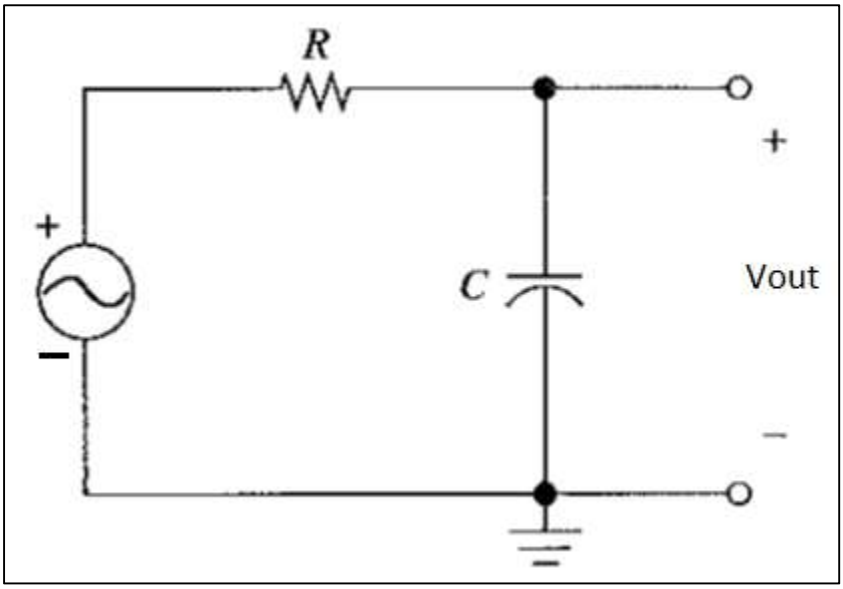


Fig. 1

4. Connect Vout to the Ch2 of the oscilloscope.
5. Measure the amplitude of the sinusoidal output voltage *Vout*. Enter the result in table 2.
6. Increase the frequency of the signal generator as indicated in table 2.

Frequency	*Amplitude (Vout)*
100 Hz	
200 Hz	
400 Hz	
800Hz	
1kHz	
2kHz	
4kHz	
8kHz	
10kHz	

Table 2

7. Determine the cutoff frequency by adjusting the frequency of the generator until the output voltage has an amplitude of Vout = (0.707)(2.0Vp) = 1.41 Vp.

8. Record the measured cutoff frequency below.

f_C	

9. Use your result in table 2 to calculate the magnitude of the gain as a ratio of the amplitudes *Vout/ Vin*. Calculate the voltage gain in decibels as

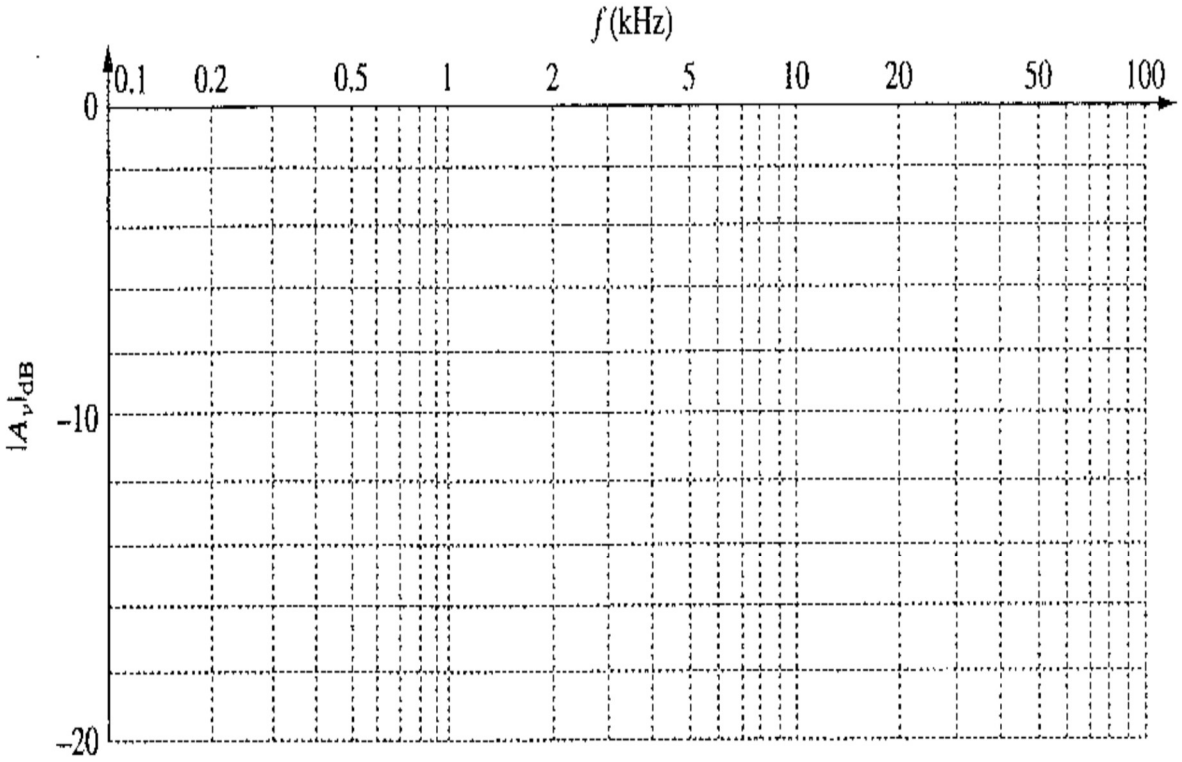
$$[A_v]dB = \quad log\ \frac{V_{out}}{V_{in}}$$

10. Record the calculated voltage gain for each frequency in table 3

Frequency (Hz)	*Av = Vout/ Vin*	*Av (dB)*
100 Hz		
200 Hz		
400 Hz		
800Hz		
1kHz		
2kHz		
4kHz		
8kHz		
10kHz		

Table 3

11. Plot the data of table 3 (voltage gain in dB versus frequency) on the graph (a).



(a) Voltage gain response

12. Compare the measured cutoff frequency ***fc*** of step 7 to the theoretical value predicted.

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