



Department of Electrical and Electronics Engineering

Lecturer: Dr. Mohab Mangoud

**Course: EENG 372**

**Quiz (1) – Online Submission(I) - A**

April 22, 2020

**Marks: 20%**  
**Time: 60 mins+10**

<b>Student Name</b>	
<b>Student ID Number</b>	

<b>Question (1)</b>	
<b>Question (2)</b>	
<b>TOTAL</b>	



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Test (1)

Marks: 20  
Time: 60 mins

**Answer the following Questions:**

Q1. Consider a message signal  $m(t) = 20 \cos(2\pi t)$  and a carrier signal  $c(t) = 50 \cos(100\pi t)$ , both in volts.

- (1) Find and sketch the resulting AM waveform **for 75% modulation** (DSB-TC)
- (2) Sketch the spectrum of this AM wave.
- (3) show and write down the bandwidth of the AM wave.
- (4) Find the total power dissipated across a load of  $1 \Omega$  for the modulated signal.

Q2. In a DSB-SC AM system, the carrier is  $c(t) = 0.5 \cos(20000\pi t)$  and the message signal is given by  $m(t) = \text{sinc}(t)$

- Find and Sketch the frequency domain (spectrum) representation of the modulated transmitted AM signal and show the bandwidth of the modulated AM signal. If the modulation scheme is:  
(a) DSB-TC      (b) DSB-SC      (c) SSB      (d) VSB
- Design a homodyne receiver to recover the signals  $m(t)$  from the received modulated signal.