Department of Electrical and Electronics Engineering
Lecturer: Dr. Mohab Mangoud

Course: EENG 372

Quiz (1) – Online Submission - C

April 22, 2020

Marks: 20%
Time: 60 mins+10

Student Name	
Student ID Number	

Question (1)	
Question (2)	
TOTAL	

Department of Electrical and Electronics Engineering
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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 Ω 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 (spectram) 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.