**Introduction to communication systems**

**Critical thinking Quiz/Assignment. Maximum Points 10.**

1 .Why do we need modulation?

2. Why do we need Fourier Transform to analyze signals?

3. What is baseband and pass band frequency?

4 .What type of propagation is implemented in DMU to make it as a WI-Fi campus and why?

5. Can you transmit power without wire ?

6. Will there be any distortion observed in DSB-SC demodulation scheme if the carrier signal is not coherent? Is it distortion or noise? Why is detection difficult in DSB-SC signal? Sketch suitable diagram and waveform if required.

7. Consider ERTA is implementing a communication project of constructing 10 radio stations in various parts of Ethiopia. You are appointed as the chief engineer for this project and given the choice of deciding between DSB-SC and DSB-C modulation. Explain with suitable diagrams (if required) which type of modulation you may choose and why?

8. A bandwidth of 100 KHz is to be considered for the transmission of AM signals .If the highest audio frequencies used to modulate the carriers is 5 KHz, how many AM broadcast stations can be accommodated in 100 KHz band simultaneously without interfering with one another?

9. The total power content of an AM signal is 1000W.Determine the power being transmitted at the carrier frequency and at each of the sidebands when the percent modulation is 100%.

10.Sketch the AM signal [A +m(t)]cosWct for the periodic triangle signal m(t) shown in the figure corresponding to the modulation index ;(a) mi=0.5;(b) mi=1;(c)mi=infinity. How do interpret the case mi=infinity?

