ET-444 Name:

Quiz 1 2021X

1. A sine wave has a frequency of 200 MHz; calculate the wavelength of this signal.

2. A signal has a bandwidth of 3kHz; signal power of 250W; noise power of 10W; find the channel capacity. (Hint: use Shannon's formula.)

3. What is a spectrum analyzer?

4. If a sine wave audio signal has a fundamental frequency of 440Hz; what is the frequency of the 3rd harmonic?

5. An amplifier has an input of 30mV and an output of 4V. Calculate the voltage gain of this amplifier and express this gain in decibels.

6. A certain signal is observed and has an signal power of 100W and a noise power of 0.3W; find the signal to noise ratio.

7. A 570kHz carrier is modulated by a 3kHz audio signal; calculate the upper and lower sidebands.

8. An unmodulated signal has an amplitude of 80V. When the signal is modulated, the amplitude increases to 120V. Calculate the modulation index.

9. An AM signal has a modulation index of 0.8 and a carrier power of 1000W. Calculate the composite power (or total power.)

10. What is the difference between AM and FM?

11. An FM signal deviates from the carrier frequency by 50kHz when it is modulated by a 5kHz audio signal. Calculate the modulation index (deviation ratio.)

12. An FM signal deviates by 100kHz from the carrier frequency when modulated by a 20kHz audio signal; calculate the bandwidth (using Carson's rule.)