Third year Project

It is required to modulate three speech signals using DSB-SC in a FDM system.

Select three audio signal with 20sec duration as a baseband signals

Select reasonable values for any required parameters.

1) Obtain an equation for the modulated signal. Plot it in time domain. Plot its magnitude spectrum.

2) Perform synchronous demodulation to restore the three signals. Explain your procedure.

3) Draw the spectrum of the original and demodulated signals and compare between them, listen and compare between them.

4) For **one of the signals**, perform demodulation with phase shifts of 10, 30, 90 degrees between the transmitter carrier frequency and the receiver carrier frequency.

5) For **one of the signals**, perform demodulation with a receiver carrier frequency that is different by 2 Hz and 10 Hz from the transmitter carrier frequency.

6) Comment on the demodulated speech signals in (3) and (4) with the help of what you studied and what could you conclude?

- **Important note: For any two copied projects the grade is zero.**
- **Deadline: 7/1/2022**
- **You can work up to two students.**
- **Submission is one pdf file containing comments, simulation results, and codes at the end of the file.**