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**Department of Electrical Engineering & Electronics,** "*Communications*" Midterm   25.04.2023

Upload until : 13:29

Two voice signals are combined to construct a larger bandwidth baseband signal as shown. This baseband signal then AM-modulates a carrier with frequency f_c=10 MHz and transmitted. f_1 is calculated from your student id; $f_1 = (10 + d)1000$ Hz where d is the last digit in your student id.
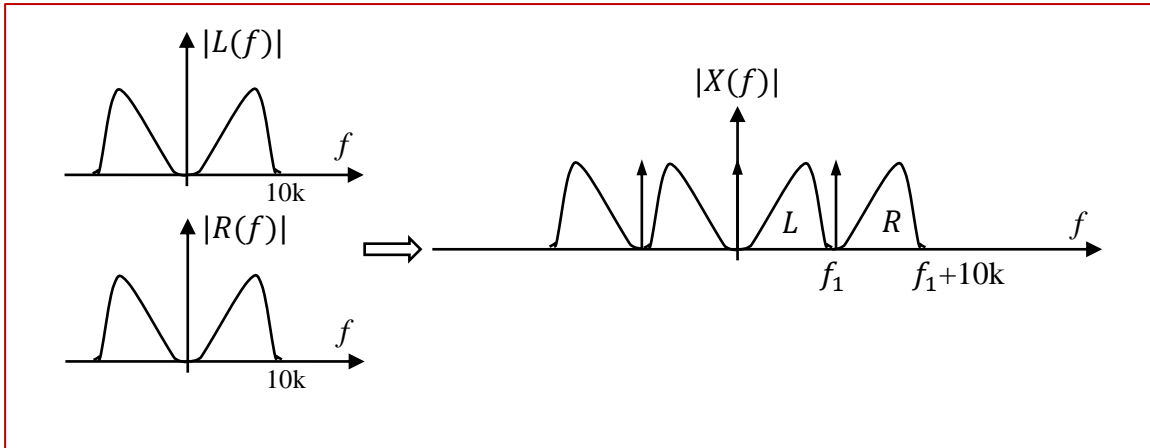
Draw the block diagram for conceptual demodulation of the modulated signal and reconstruction of separate L and R channels. Use only the blocks given below.

adder   multiplier   phase-shift   filter
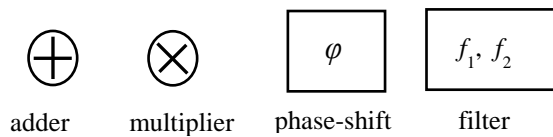
A solution:
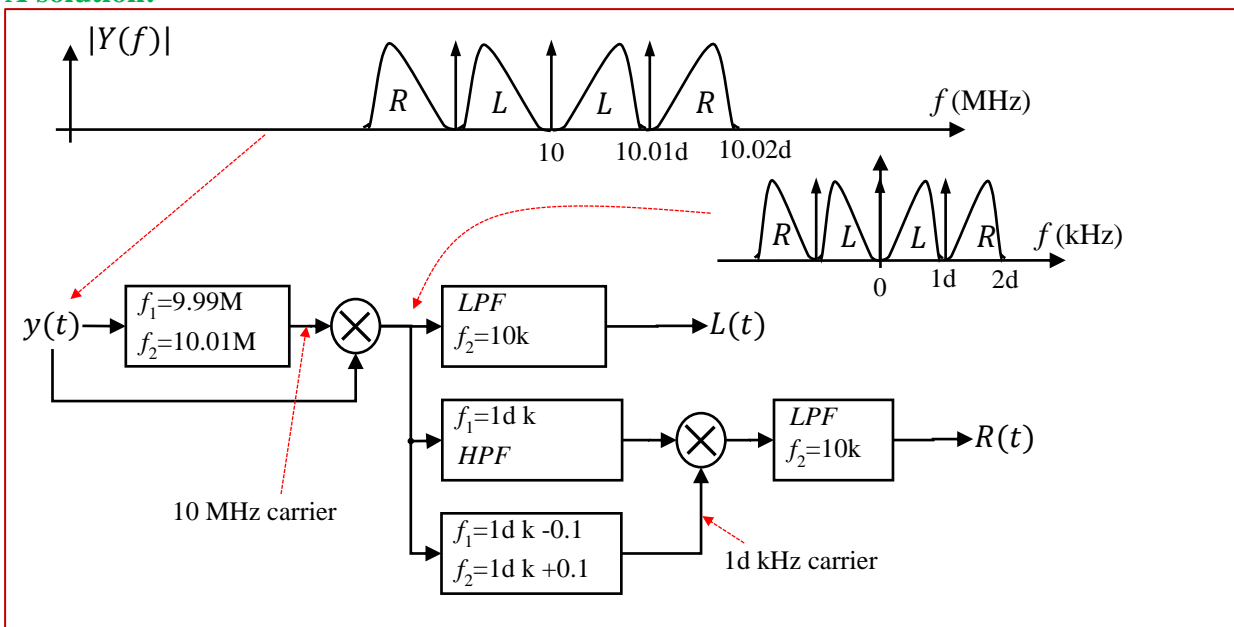
We extracted 10 MHz carrier first and down-converted everything to baseband, used a LPF to extract L, extracted 1d kHz carrier to synchronously demodulate USB-modulated R channel. (if last digit of your *studentid* is 4, for example, 1d means 14)(note that we also create components at 20 MHz which are filtered out by filters.)