

## RADIO ENGINEERING I HOME ASSIGNMENT 6/2025 HW6

Return by 12.12.2025 @20.00

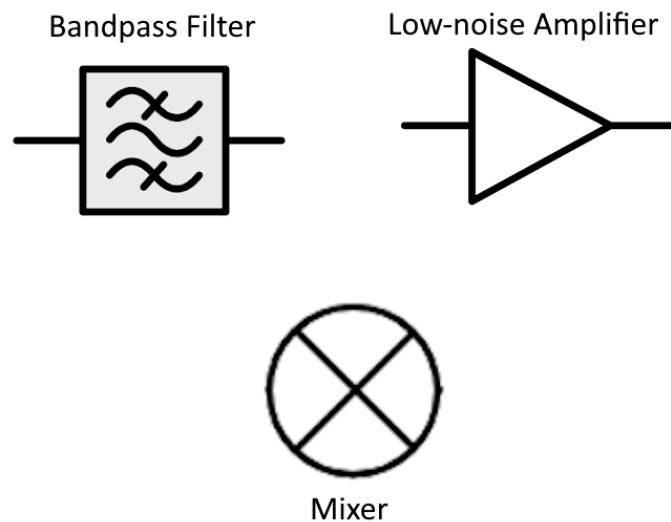
Return your answer into Moodle.

Write tag HW6, your name, and student ID on all sheets you are returning.

Name \_\_\_\_\_

Student ID \_\_\_\_\_

1. Your employer has asked you to design a portion of an RF-receiver with the following components:



The bandpass filter introduces a loss of **-1.5 dB** to the system. The low-noise amplifier amplifies the signal by **12 dB**, but also has a noise-figure (NF) of **2.5 dB**. The mixer uses an active topology, which causes it to amplify the signal by **5 dB**, but unfortunately comes with a noise figure (NF) of **8dB**.

In what order should these components be placed to achieve the lowest NF in the system? What about maximum gain? Prove numerically and with explanations.