Special Problem 4.E-5

In the receiver below, we know that:

1. The minimum detectable signal is **-100 dBm**.

2. The **total** dynamic range of the receiver is **105 dB**.

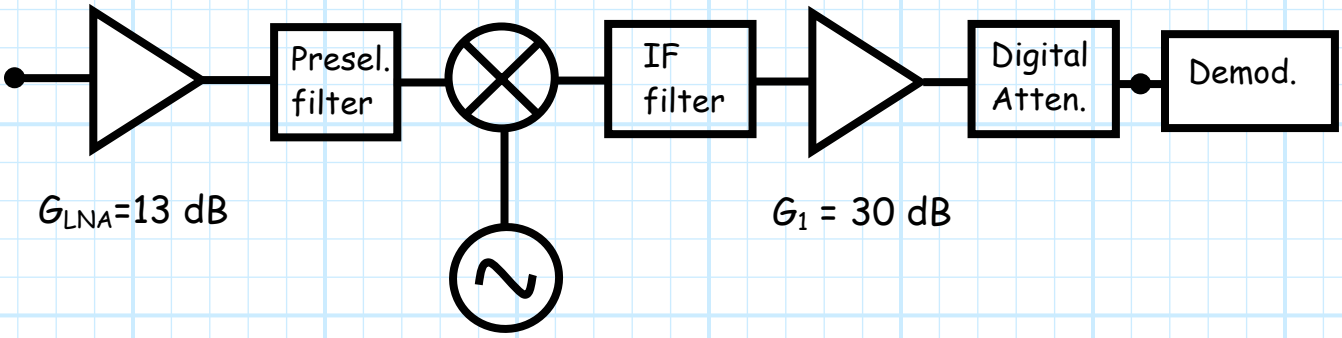
3. The **demodualtor** signal power (i.e. the output power of the receiver) must be $\leq$ **-10dBm** in order for the signal to be accurately demodulated.

4. The **conversion loss** of the **mixer** is 6 dB, the **insertion loss** of each **filter** is 0 dB.

5. The digital attenuator has a **minimum** attenuation setting of 2 dB.

6. This **attenuator** dynamic range is **just barely** large enough to satisfy the receiver design goals (i.e, to accurate demodulate any input signal within its total dynamic range).

7. The receiver was **properly** designed by a **competent** radio engineer.



Determine the **instantaneous dynamic range** of this receiver, the **maximum attenuation** setting of the digital attenuator, **and** the **minimum signal power** required by the demodulator (i.e., the minimum power out of the receiver for accurate demodulation).