Birla Institute of Technology & Science, Pilani, Rajasthan
First Semester 2021-2022
Mid-Semester Lab Test: Python (14-11-2021)

Course: EEE F311 Communication Systems
Instructor-in-Charge: S M Zafaruddin

Duration: 60 Minutes, Marks =4

Instructions

- Make a folder named as IDname in the desktop.
- Make .py files and name them as Q1a underscore yourID etc.
- Make a word file with name IDname.
- Compile the code/plot/result/observation/conclusion in the word doc.

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1. A message signal $m(t) = 2\sin(10\pi t)$ frequency modulates a carrier signal of frequency 100Hz and amplitude 100 Volt with $k_f = 20$ Hz/Volt. The FM signal is transmitted over a channel with path channel $h(t) = \frac{G\lambda}{4\pi d}\delta(t)$, where $G = 10$dBi and d is the distance between transmitter and receiver. An AWGN $N \sim (0, 6)$ is added to the modulated signal at the receiver.
   (a) Plot the FM modulated signal (frequency domain) at the receiver at $d = 10$ km. [**1 Mark**]
   (b) Plot the histogram of AWGN. [**1 Mark**]
   (c) Plot the average SNR versus distance (1 km to 100 km) of the FM signal at the receiver. [**2 Marks**]