Task: Verification of different properties of LTI system: Commutation, Association, Distribution, Identity

A. Different properties of LTI system are expressed as,

$$x_1(n) * x_2(n) = x_1(n) * x_2(n) \quad : \text{Commutation}$$
$$[x_1(n) * x_2(n)] * x_3(n) = x_1(n) * [x_2(n) * x_3(n)] \quad : \text{Association}$$
$$x_1(n) * [x_2(n) + x_3(n)] = x_1(n) * x_2(n) + x_1(n) * x_3(n) \quad : \text{Distribution}$$
$$x(n) * \delta(n - n_0) = x(n - n_0) \quad : \text{Identity}$$

Verify the above properties for the following signals **by writing a MATLAB script**. Next, also verify the result obtained in MATLAB script with Analytical method.

$$x_1(n) = \cos(\pi n/4)[u(n+5) - u(n-25)]$$
$$x_2(n) = (0.9)^{-n}[u(n) - u(n-20)]$$
$$x_3(n) = \text{round}[5w(n)],\ -10 \le n \le 10,\ \text{where } w(n) \text{ is uniform over } [-1, 1]$$

Structure of lab report

a) Title of the experiment → "Creation a document using MS office"

b) Your name → XYZ, Roll-no: 1234

c) About the experiments →

d) Content of the experiment (diagram/programme source code/flowchart) →

e) Your observation/what you learned →

After complementation of the LAB, document has to be uploaded in Google classroom
filename: StudentName_rollNo

Thank you!