**DIGITAL SIGNAL PROCESSING – EC5011**

LABORATORY SESSION 1

DIGITAL SIGNAL PROCESSING THEORY AND APPLICATION

**PRE-LAB PREPARATION**

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PART1: SAMPLING, TIME DOMAIN & FREQUENCY DOMAIN REPRESENTATION

x[n] = cos(2\*pi\*100\*t)+cos(2\*pi\*500\*t)+cos(2\*pi\*2000\*t) +cos(2\*pi\*2750\*t)

**sampling frequency of 4000Hz;**

fN = fS / 2 = 4000Hz / 2 = 2000Hz

Only frequencies **above** 2000 Hz will **alias**.

fa ​ = ∣ f − k⋅ fs ​ ∣ where fa ​≤ fN

**2750 Hz** Greater than Nyquist ⇒ **will alias**.

Let’s find the alias:

fa=∣2750−4000∣=∣−1250∣=1250 Hz

So, 2750 Hz aliases to **1250 Hz**.