COMMUNICATION SYSTEMS

HOMEWORK # 7:

Please work out the **ten** (10) problems stated below – LD refers to the text: B,P. Lathi and Z. Ding, *Modern Digital and Analog Communication Systems* (Fourth Edition), Oxford University Press, Oxford (UK), 2009. Exercise **2.1-1** (LD) refers to Exercise 1 for Section 2.1 of LD.

Show work and **explain** reasoning. Three (3) problems, selected at random amongst these ten problems, will be marked.

1. Consider a low-pass signal $g : \mathbb{R} \to \mathbb{R}$ with cutoff frequency $B > 0$. Derive the interpolation formula for recovering $g : \mathbb{R} \to \mathbb{R}$ on the basis of the samples $\{g(nT_s),\ n = 0, \pm 1, \pm 2, \ldots\}$ whenever the condition $2BT_s < 1$ holds, i.e., sampling occurs at rate higher than the Nyquist rate.

2. Problem **6.1-2** (LD).

3. Problem **6.1-3** (LD).

4. Problem **6.1-4** (LD).

5. Problem **6.1-6** (LD).

6. Problem **6.1-10** (LD).

7. Problem **6.2-1** (LD).

8. Problem **6.2-2** (LD).

9. Problem **6.2-3** (LD).

10.

Problems **6.2-4**, **6.2-6** and **6.2-7** (LD).