LAHORE UNIVERSITY OF MANAGEMENT SCIENCES
Department of Electrical Engineering

EE310 Signals and Systems
Quiz 02

Name: _____

Campus ID: _____

Total Marks: 10
Time Duration: 15 minutes

Question 1 (6 marks)

For a system described by the following input-output relationship:

$$y(t) = \big(2 + \sin(t)\big)\, x(1 - t),$$

where $x(t)$ and $y(t)$ denote the input signal and output signal respectively, determine whether the system is (i) linear, (ii) time-invariant and (iii) causal. *Briefly* justify your answer for each case. No credit will be given for correct answer without justification.

Question 2 (4 marks)

For a system described by the following input-output relationship:

$$y[n] = \sum_{k=-3}^{n-4} x[k],$$

where $x[n]$ and $y[n]$ denote the input signal and output signal respectively, determine whether the system is stable and invertible. If the system is invertible, determine the inverse system.

Note that the upper index of summation, in general, cannot be smaller than the lower index. If the upper index is smaller than the lower index, the summation result is zero, that is (for example),

$$\sum_{i=a}^{b} i = 0, \quad \text{for} \quad b < a.$$