ENG 281: Engineering Mathematics I

| **Session:** 2019/2020 | **Semester:** First | **Unit:** 3 | **Duration:** 4 days |

Instruction: Answer all the questions.

Question 1 [10 Marks]

The set of models of a system is as given in Equation (1). With the aid of MathCAD, estimate the values of the *x's* in the model equation.

$$\left.\begin{cases} x_1 - 2x_2 - x_3 + 3x_4 = 10 \\ 2x_1 + 3x_2 + x_4 = 8 \\ x_1 - 4x_3 - 2x_4 = 3 \\ -x_2 + 3x_3 + x_4 = -7 \end{cases}\right\} \tag{1}$$

Question 2 [10 Marks]

The model equation of a system has been developed to be $y = \sin(0.25t) + 2t + e^{-0.85t} - 2\cos\dfrac{\pi}{10}t$. With the aid of MathCAD, determine its dynamic response in tabular and graphical forms for $0 \le t \le 10\,hr$ with $\Delta t = 0.1\,hr$.