



AFE BABALOLA UNIVERSITY, ADO-EKITI, EKITI STATE, NIGERIA
COLLEGE OF ENGINEERING
DEPARTMENT OF CHEMICAL AND PETROLEUM ENGINEERING

BACHELOR OF ENGINEERING ASSIGNMENT III

ENG 382: Engineering Mathematics IV

Session: 2019/2020

Semester: Second

Unit: 3

Duration: 6 days

Instruction: Answer all the questions.

Question 1 [40 Marks]

The model of a system having thermocouples measuring temperatures, T ($^{\circ}\text{C}$), at its different points is given by the set of expressions in Equation (1). Estimate the values of the temperatures, in K (Kelvin), using:

- Gauss elimination method with the aid of **Microsoft Excel**,
- Gauss elimination method with the aid of **MathCAD**,
- matrix inverse method with the aid of **Microsoft Excel**, and
- matrix inverse method with the aid of **MathCAD**.

$$\begin{cases} 2T_1 + 2T_2 - 4T_3 + 2T_4 + 6T_5 - 2T_6 = 12 \\ 4T_1 - 2T_2 + 2T_3 + 4T_4 + 2T_5 - 6T_6 = 60 \\ 2T_1 + 6T_2 - 6T_3 - 2T_4 + 4T_5 + 2T_6 = -45 \\ 10T_1 + 4T_2 - 2T_3 - 2T_4 + 4T_5 + 2T_6 = -9 \\ -6T_1 - 2T_2 + 4T_3 + 6T_4 + 2T_5 + 6T_6 = 48 \\ 8T_1 + 6T_2 + 2T_3 - 12T_4 - 6T_5 - 4T_6 = -81 \end{cases} \quad (1)$$