


Philadelphia University Faculty of Engineering Department of Computer Engineering		Date:- 27/11/2017 Allowed time:-50 minutes
Engineering Analysis (630262) First Exam		
Student Name:-		ID:-

Instructor:	<input type="checkbox"/> Dr. Mohamed Mahdi	<input type="checkbox"/> Eng. Sultan Al-Rushdan	
Lecture Time:	<input type="checkbox"/> 09:10	<input type="checkbox"/> 12:10	<input type="checkbox"/> 12:45

NOTES: - Round ALL your calculations to 4 significant digits.
 - Angles for trigonometric functions are in radian scale

Question 1: Approximate the root of the following equation using False-Position method with Relative Error less than 0.03, using $x_l = 0.6$ and $x_u = 2.7$. 5 points

$$f(x) = 2.35 \ln(x) + 1.22 \cos(2\sqrt{x})$$

Question 2: Given the following equation: 5 points

$$f(x) = \sin^2(e^x)$$

- 1- Simplify Newton-Raphson formula to its simplest form.
- 2- Approximate the root using Newton-Raphson starting from $x_0 = 2.1$, perform iterations until the Relative Error less than 0.02.

Question 3: Given the following system of linear equations: 5 points

$$3x - y + z = 0.6$$

$$2x + 4y + z = -10.4$$

$$2x - 4y + 8z = 27.8$$

Perform **two** guess-siedel iterations starting from $x_0 = 1$, $y_0 = -2$, $z_0 = 3$

Question 4: Perform the following requirements (**show your calculations**). 5 points

1- If $x_3 = 8.697$ and $x_4 = 8.701$ then x_4 is correct for ____ significant digits.

2- Find the inverse of $A = \begin{bmatrix} 1.7 & 2.4 \\ 1.5 & 2 \end{bmatrix}$

3- Find the Eigen values of $A = \begin{bmatrix} -3 & 6 \\ -1 & 4 \end{bmatrix}$