Department of Electrical Engineering
Assignment
Date: 07/05/2020

Course Details

Course Title: Numerical Analysis **Module:** _____
Instructor: _____ **Total Marks:** 20

Student Details

Name: _____ **Student ID:** _____

Q1.	(a)	Consider the tri-diagonal matrix $\mathbf{A} = \begin{pmatrix} 4 & 2 & 0 \\ 2 & 2 & 1 \\ 0 & 1 & 1 \end{pmatrix}$ To find eigenvalues one uses a QR algorithm involving successive iterations of Givens rotations. Apply one complete iteration of Givens rotations to this matrix.	Marks 10 CLO 2
Q2.	(a)	Consider the function sin(x). a. Compute the quadratic Taylor polynomial approximation to sin(x) expanded about the point $x = \pi/4$. b. Give an upper bound on the error of this Taylor polynomial for $x \in [0, \pi/2]$. c. Compute the polynomial that interpolates sin(x) at the points $x = 0, \pi/4, \pi/2$. d. Give an upper bound on the error of this interpolating polynomial for $x \in [0, \pi/2]$. Which of the two polynomials have smaller maximum error on $x \in [0, \pi/2]$?	Marks 10 CLO 1