Department of Electrical Engineering Mid – Term Assignment Spring 2020 Date: 20/04/2020

Course Details

<u>Course Details</u>											
	Course Title: Instructor:			Numerical Analysis					Module: Total Marks:30		
Student Details											
N	lame	:	JUNAID UR REHMAN					Studen	nt ID:	11484	
Q1.	(a)	1. A 3x. a.		ty matrix has a	total of 3 and		en values. different				Marks 11 CLO 1
		2. Eiger a.	real	of a symmetric	c matrix are all _	b.	zero complex positive				
		3. All or a.	Jacobi	i's method	te difference met	hods exc b.	ept for Newton's method	backward			
		4. The c ident		ix.	iial of a 3x3 iden	tity matr b.		lifference met		of the 3x3	
		a. 6. Is the a.	true determ true	iinant of a diag	e characteristic po onal matrix the p	b. roduct of b.	false the diagon false	al elements?			
		its ma a. c.	in diag No At lea	onal. st two	ethod of solving	b. d.	At least o At least th	ne nree		-	
	 8. The power method can be used only to find the Eigen value of "A" that is largest in we call this Eigen value the dominant Eigen value of "A". a. true b. false 9. Central difference method is the finite difference method. 									ute vulue,	
		a. true b. false 10. Iterative algorithms can be more rapid than direct methods. a. true b. false 11. $\Delta f_r = f_{r+1} - f_r$ is known as difference operator. a. forward b. backward									
Q2.	(a)	c. central d. none Use bisection method to solve the equation $x^2 - 7 = 0$, Perform four iterations and show all the necessary steps.									Marks 6 CLO 1
Q3.	(a)	1	te the v	alue of 0.25 usi 0.2 0.2304	ng Newton's for 0.3 0.2788	ward dif 0.4 0.3222	0	nula. Show all .5 .3617	the necessary 0.6 0.3979	y steps.	Marks 6 CLO 1
	(b)		ton Rap		o find root of $f(x)$					itions.	Marks 6 CLO 1

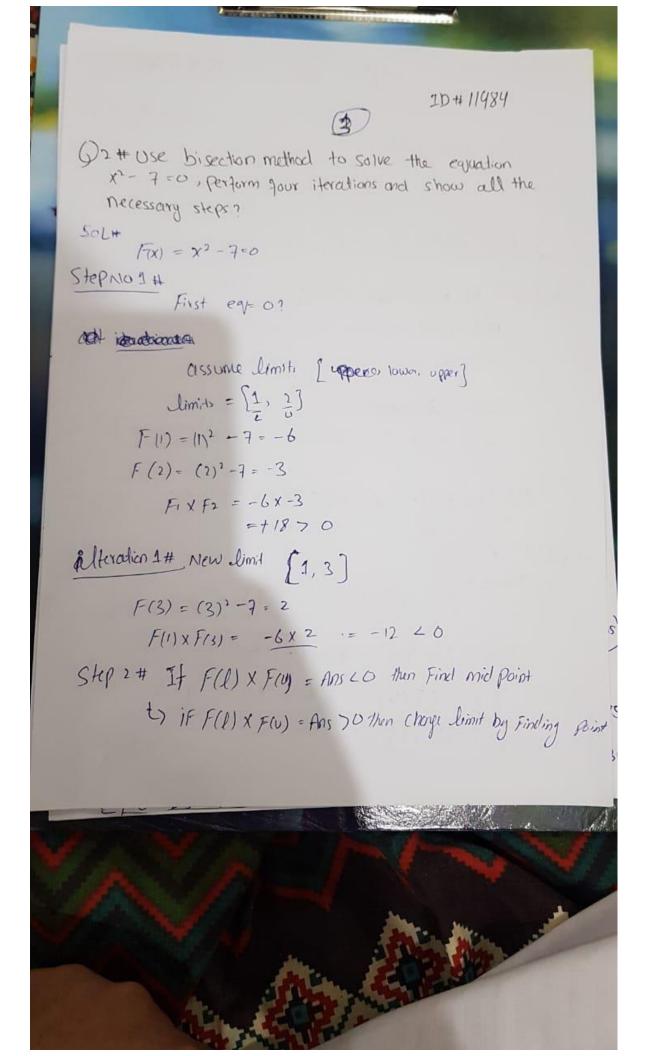
NAME # Junaid - Ux - Reh mon 1 ID # 11484 Q1 # multiple chaile questions. (2) A 3x3 identity materix has a total of 3 and -Eigen values? Ang# Same (A). (2) Eigen values of a symmetric materix are all -Ans # TA real. (3) All of the gollowing are finite difference methods except for Any # (b) newton backward difference method. (4) The characteristics polynomial of a 3x3 identity materix is ______. if x is the Rigen value of the 3x5 identity materix. AN3#(C) x3-1 (5) two matrix with the same characteristic polynomial does not need to be similar Ans # (b) false

NAME Junaid - un Rehmon (2) ID # 11984 (6) Is the deferminant of a chargonal matrix the product of the diagonal element? Ars #(A) true. (1) The Jacobi's method is a method of solving matrix equadion on a madrix that has - Zeros aloy its main diagonal. AN (A) no (8) The power method can be used only to find the Eigen Values of 'A' that is largest in absolute values we call this Eigen value. the dominant Eigen value of 'n'. ANS# (A) true (9) central difference method is the finite difference method Ans#(A) true (10) Heradie algorithms in be more rapid than direct method. Ans# (B) false DAfr=fr+1 - fr is known as - difference operator. Ans#(A) forward.

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Find (=? mid point

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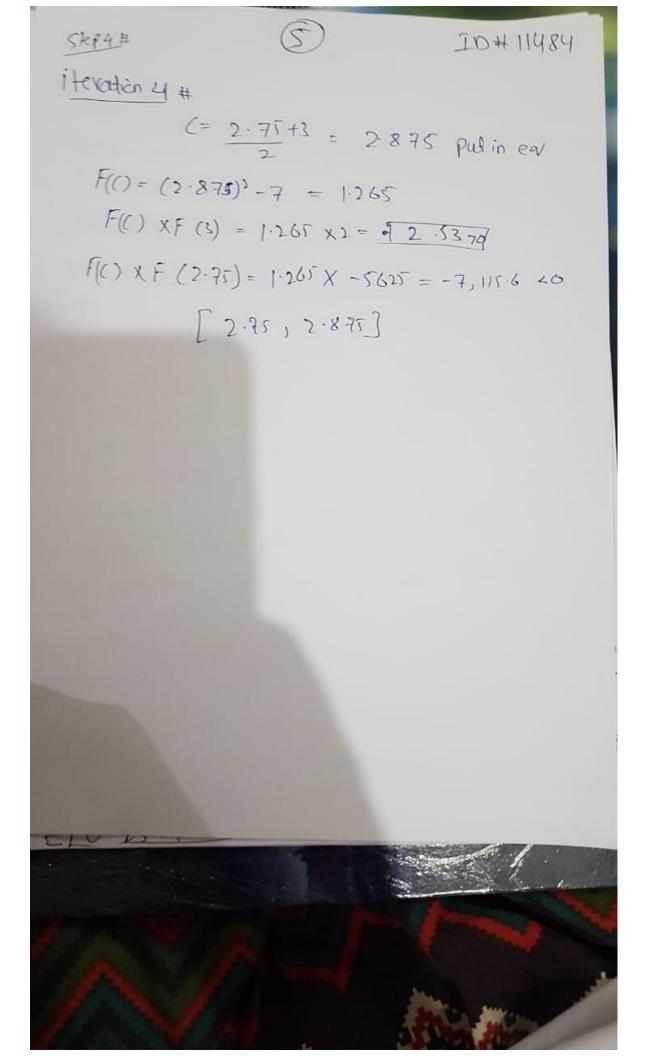
$$(= \frac{1}{2} + \frac{3}{2} = \frac{1}{2} + \frac{1}{2} = 2$$
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$$(= \frac{1}{2} + \frac{3}{2} = \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2$$

Therefore are equese

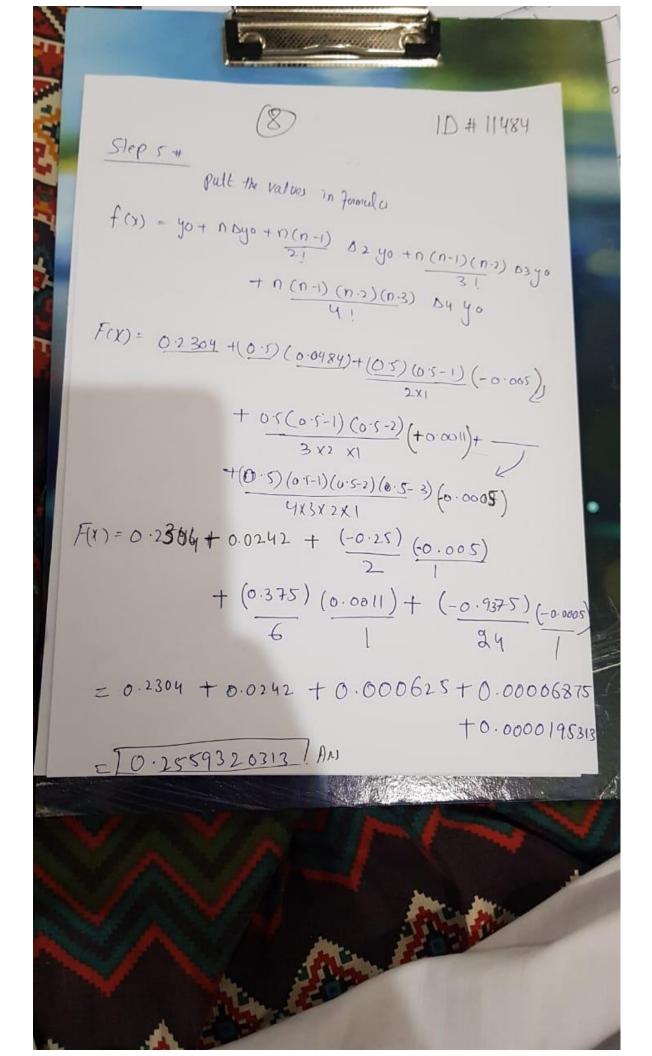
$$(-5) = (-1)^{2} - 7 + 5 + 3 = 7 - 5 + 50$$

F(3+5) × F(3) = (-0.75) × 2 = -15 × 0
Strept = $\frac{1}{2} + \frac{1}{3} = \frac{1}{3}$
i treations the $(= \frac{2}{3} + \frac{1}{3} + \frac{1}{2} + \frac{1}{3})$
i treations the $(= \frac{2}{3} + \frac{1}{3} + \frac{1}{2} + \frac{1}{3} + \frac{1}{2} + \frac{1}{3}$
i treations the $(= \frac{2}{3} + \frac{1}{3} + \frac{1}{2} + \frac{1}{3} + \frac{1$



6 ID # 11484 71 Q310) # Inter polate the value of 0.25 Using newster i forward Officience formula show all the necessary steps 1 0-2 0-2 0-4, 0-5 0-6 F(x) 0.2304 0.2718 0.3222 0.3617 6.3979 SOL# Step14 Difference toble X 4 1 2 A3 A4 4 0.2 10.2304 0.0484 -0.005 + 0.0011 0.0005 0.3 0.2788 0.0434 -0.0039 0.0006 0.4 0.3222 0.0395 -0.033 0.5 0.3617 0.0362 0.6 0.3979 54 40 D: yo D2 yo 0.2304 0.0484 -0.005 +0.0011 0.0005 > Step No2 Stel alazett all a set

(7) 1D # 11484 StepNoz # X= a+nh > X= 0.25 0 = 0 - 2 h = 0 - 2 [h = x2 - x1] Publicy the values X= a+nh 0.25= 0.2 + n (0.1) 0.25-0.20= 0(0.1) StepNo4] 0:05 = n (0.1) Now find n = $U = \frac{0.01}{0.01} = 0.2$ N=0.57 CORRECT H N= 0.5 yo=0.2304, Dyo=0.0484 Dzyo=-0.005 D3 yo = + 0.0011, Dy yo= 0.0005 USAN Journely Flat nh) = fin et & alast ant



$$(2) \qquad 10 \pm 11484$$

$$(30) \pm 05e newton Raphson method to Jind rot
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1 + 1exetions *
$$(30) \pm 05e newton Raphson Jumula
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$$(31) \pm 1exetion Raphson Jumula
1 + 1exi - f(xi)
2 + 1exi -$$$$$$$$