

Midterm Exam 1

10 April 2018 - 09:00

You can bring course notes, not any book
↳ lumped (zimbali)

There are 3 Questions for 4 topics.

Topics 1: Root finding for one variable functions.
(5 methods) (Except for Muller's)

Topics 2: Solution linear equations of system
(3 methods)

Topics 3: Solution of nonlinear " " "
(2 methods)

Topics 4: Interpolation (Polynomial)
(3 method)

Exam Sample

1- Find the root of $y = f(x) = e^x - 5 \sin(x)$ (not degree) \rightarrow in radian
 $a = -1, b = 1, \epsilon = 0,01$ by bisection method.

2- Find the solution
 $5x_1 - x_2 - 3x_3 = -6$
 $-x_1 + 7x_2 - x_3 = 7$
 $x_1 + 2x_2 + 4x_3 = 16$ by Gauss-Seidel method,
(show first two steps detailed)

(Initial approximation $x_1^0 = x_2^0 = x_3^0 = 0$ $\epsilon = 0,01$)
 \checkmark via Pivoting

3- Find the solution of

$$10x + 3y^2 = 3$$

$$x^2 - e^y = 2$$

by N-R method
(for 2 iterations)

$$x_0 = -1,5$$

$$y_0 = -2,5$$

Answer 1

#	a	b	f(a)	f(b)	c ^{root}	f(c)
1	-1	1	4,5752	-1,4891	0	1
2	0	1	1	-1,4891	0,5	-0,784
3	0	0,5	1	-0,784	0,25	0,0470
4	0,25	0,8	0,0470	-0,784	0,375	-0,3764
5	0,25	0,375	0,0470	-0,364	0,3125	-0,1764

Ans #2

$$x_1 =$$

$$y_1 =$$

$$z_1 =$$

#1

$$x_1 =$$

$$y_1 =$$

$$z_1 =$$

#2

4. $\begin{bmatrix} x_2 \\ y_2 \end{bmatrix} = \begin{bmatrix} -1,4456 \\ -2,4122 \end{bmatrix}$ The result of #2

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