

MTH-603 Numerical Analysis Update MCQS For Quiz-1 File Solve By Vu Topper RM

85% To 100% Marks



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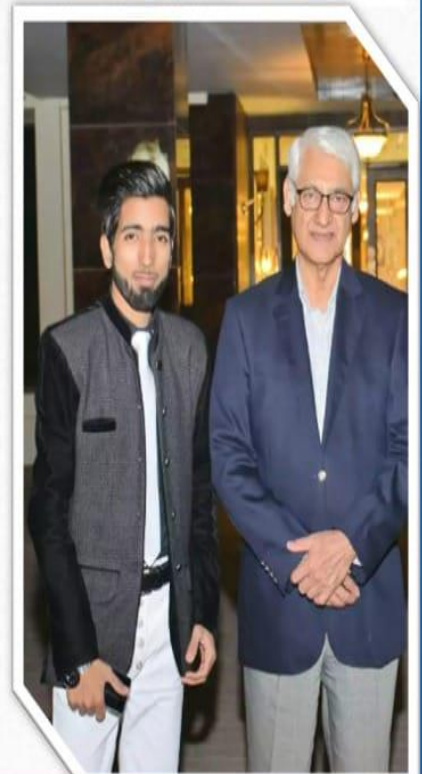
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While using the Gauss-Seidel Method for finding the solution of the following system $2x+2y+z=3$, $x+3y+z=2$, $x+y+z=2$ with the initial guess $(0,0,0)$, the next iteration would be

- A. $(32, -23, -2)$
- B. $(32, 57, 19)$
- C. $(32, 16, 13)$**
- D. $(32, 23, 2)$

Which of the following system of equation is diagonally dominant?

- A. $8x+y-z=5$, $2x+13y+5z=7$, $x+2y+9z=3$**
- B. $8x+y-z=5$, $x+2y+9z=3$, $2x+13y+5z=7$
- C. $2x+13y+5z=7$, $8x+y-z=5$, $x+2y+9z=3$
- D. $x+2y+9z=3$, $8x+y-z=5$, $2x+13y+5z=7$

Which of the following systems of linear equations has a strictly diagonally dominant coefficient matrix?

- A. $-2x_1+7x_2+2x_3=5$, $6x_1-2x_2+3x_3=1$, $x_1+x_2-5x_3=-13$
- B. $-2x_1+7x_2+2x_3=5$, $6x_1-2x_2+3x_3=1$, $x_1+x_2-5x_3=-13$
- C. $6x_1-2x_2+3x_3=1$, $-2x_1+7x_2+2x_3=5$, $x_1+x_2-5x_3=-13$
- D. $x_1+x_2-5x_3=-13$, $6x_1-2x_2+3x_3=1$, $-2x_1+7x_2+2x_3=5$**

While solving a system of three linear equations in three variables by Jacobi's method, the first approximate solution is NECESSARY to be taken as $(0,0,0)$.

- A. True
- B. False**

While using the Gauss-Seidel Method for finding the solution of the system of equation, the following system

$x+2y+2z=3$, $x+3y+3z=2$, $x+y+5z=2$ can be rewritten as

- A. $x=3-2y-2z$, $y=23-x3-zz=25-x5-y5$
- B. $x=32-y-z$, $y=2-x3-zz=25-x5-y5$**
- C. $x=1-23y-23zy=1-32x-32zz=1-y2-x2$

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D. $x=3-2y-2zy=2-x-3zz=2-y-x$

While solving the system; $x+4y = 4$, $2x-y = 1$ by Gauss-Seidel method, which of the following ordering will lead more rapidly to the desired order of accuracy?

A. $2x-y = 1$, $x+4y = 4$

B. no need to reordering

C. $x+4y = 1$, $2x-y = 4$

D. $x-2y = 1$, $x+4y = 4$

In Gauss-Jacobi's method, the corresponding elements of $x(r+1)$ replaces those of $x(r)$ as soon as they become available.

A. True

B. False

An augmented matrix may also be used to find the inverse of a matrix by combining it with the matrix.

A. Inverse

B. None of the given choices

C. Identity

D. Square

The system of linear equations; $2x+3y = 6$, $x+4y = 5$ is not strictly diagonal dominant as-----

A. $|2| < |3|$

B. $|2| < |4|$

C. $|2| < |1|$

D. $|3| < |4|$

While using the Gauss-Seidel Method for finding the solution of the following system $3x+y+z=11$, $2x+5y-z=16$, $x+y+5z=4$ with initial guess $(0,0,0)$, the next iteration would be

A. $(113, 165, -45)$

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- B. (113, -165, -45)
- C. (113, 2615, -725)
- D. (113, 511, 213)**

While solving a system of linear equations by Gauss Jordan Method, in which of the following case the partial pivoting is essential?

- A. When lower triangular entries are zero
- B. When pivots are zero
- C. When the upper triangular entries are zero
- D. When diagonal entries are zeros**

Which of the following system of equation is diagonally dominant

- A. $3x+y+z=3$, $x+y+5z=2$, $2x+5y-z=4$
- B. $x+y+5z=2$, $3x+y+z=3$, $2x+5y-z=4$**
- C. $3x+y+z=3$, $2x+5y-z=4$, $x+y+5z=2$
- D. $2x+5y-z=4$, $3x+y+z=3$, $x+y+5z=2$

In method, matrix [A] of the system of equations is decomposed into the product of two matrices [L] and [U], where [L] is a lower-triangular matrix and [U] is an upper-triangular matrix with 1's on its main diagonal.

- A. Gauss-Seidel
- B. Crout's Reduction**
- C. None of the given choices
- D. Gaussian elimination

Which of the following systems of linear equations has a strictly diagonally dominant coefficient matrix?

- A. $7x_1+5x_2-1x_3=9$, $-x_1+3x_2+x_3=1$, $x_1+2x_2+4x_3=1$
- B. $4x_1+2x_2+3x_3=1$, $7x_1+5x_2-8x_3=9$, $-5x_1+3x_2+2x_3=1$**
- C. $4x_1+2x_2+3x_3=1$, $-5x_1+3x_2+2x_3=1$, $7x_1+5x_2-8x_3=9$
- D. $-5x_1+3x_2+2x_3=1$, $7x_1+5x_2-8x_3=9$, $4x_1+2x_2+3x_3=1$

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Which of the following rearrangement make strictly diagonal dominant, the system of linear equations; $x-3y+z = -2$, $-6x+4y+11z=1$, $5x-2y-2z=9$?

- A. $5x-2y-2z=9$, $x-3y+z = -2$, $-6x+4y+11z=1$
- B. $5x-2y-2z=9$, $-6x+4y+11z=1$, $x-3y+z = -2$
- C. No need to rearrange as system is already in diagonal dominant form.
- D. $-6x+4y+11z=1$, $x-3y+z = -2$, $5x-2y-2z=9$**

How many Eigen values will exist corresponding to the function; $\text{Exp}(ax) = e^{ax}$, when the matrix operator is of differentiation?

- A. Infinite many
- B. Unique**
- C. None
- D. Finite Multiple

Jacobi's method is highly recommended for matrix to compute all the Eigen values and the corresponding eigenvectors.

- A. None of the given choices
- B. non real symmetric
- C. real un-symmetric
- D. real symmetric**

For a function; $y=f(x)$, if y_0 , y_1 and y_2 are 2,3 and 5 respectively then which of the following will be 2nd order Leading difference at $y_0 = 2$?

- A. 2
- B. 1**
- C. -2
- D. -1

Direct methods can be more rapid than iterative algorithms.

- A. true**
- B. false

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If the product of two matrices is an identity matrices that is $AB = I$, then which of the following is true?

- A. B is singular
- B. A is singular
- C. A is inverse of B**
- D. A is transpose of B

A and its transpose matrix have _____ eigenvalues.

- A. same**
- B. different

For differences methods we require the initial approximation.

- A. true**
- B. false

Question No:1

(Marks:1)

Vu-Topper RM

In Jacobi's Method, We assume that theelements does not vanish.

- A. Diagonal**
- B. Off-diagonal
- C. Row
- D. Column

ok

Question No:2

(Marks:1)

Vu-Topper RM

While solving a system of linear equations, which of the following approach is economical for the computer memory?

- A. Direct
- B. Iterative**
- C. Analytical
- D. Graphical

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ok

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Question No:3

(Marks:1)

Vu-Topper RM

Back substitution procedure is used in

A. Gaussian Elimination Method

B. Jacobi's method

C. Gauss-Seidel method

D. None of the given choices

Question No:4

(Marks:1)

Vu-Topper RM

If $n \times n$ matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities).

A. True **ok**

B. False

C. Both

D. None

Question No:5

(Marks:1)

Vu-Topper RM

The basic idea of relaxation method is to reduce the largest residual to

A. One

B. Five

C. Two

D. Zero

Page 83

ok

Question No:6

(Marks:1)

Vu-Topper RM

The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its _____.

A. Main diagonal

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ok

B. last column

C. last row

D. first row

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Question No:7

(Marks:1)

Vu-Topper RM

If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix, the eigenvalues of A are the diagonal entries of A.

A. TRUE

B. FALSE

Question No:8

(Marks:1)

Vu-Topper RM

A 3 x 3 identity matrix have three and different eigen values.

A. TRUE

B. FALSE

Question No:9

(Marks:1)

Vu-Topper RM

Which of the following is a reason due to which the LU decomposition of the system of linear equations; $x+y = 1$, $x+y = 2$ is not possible?

A. Associated coefficient matrix is singular

B. All values of l's and u's can't be evaluated

C. Determinant of coefficient matrix is zero

D. All are equivalent ok

Question No:10

(Marks:1)

Vu-Topper RM

Gauss - Jordan Method is similar to

A. Gauss-Seidel method

B. Iteration's method

C. Relaxation Method

D. Gaussian elimination method

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ok

Question No:11

(Marks:1)

Vu-Topper RM

While using Relaxation method, which of the following is the largest Residual for 1st iteration on the system; $2x+3y = 1$, $3x + 2y = -4$?

A. -4

B. 3 ok

C. 2

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D. 1

Question No:12

(Marks:1)

Vu-Topper RM

Gauss–Seidel method is also known as method of

A. Successive displacement

Page 263

ok

B. Iterations

C. False position

D. None of the given choices

Question No:13

(Marks:1)

Vu-Topper RM

Jacobi's Method is a/an.....

A. Iterative method

Page 69

ok

B. Direct method

Question No:14

(Marks:1)

Vu-Topper RM

The characteristics polynomial of a 3×3 identity matrix is _____, if x is the eigen values of the given 3×3 identity matrix. where symbol $^{\wedge}$ shows power.

A. $(x-1)^3$

B. $(x+1)^3$

C. x^3-1

ok

D. x^3+1

Question No:15

(Marks:1)

Vu-Topper RM

They can be used only to find the eigenvalue of A that is largest in absolute value—we call this eigenvalue the dominant eigenvalue of A .

A. TRUE

B. FALSE

Question No:16

(Marks:1)

Vu-Topper RM

In method, a system is reduced to an equivalent diagonal form using elementary transformations.

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- A. Jacobi's
- B. Gauss-Seidel
- C. Relaxation

D. Gaussian elimination

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ok

Question No:17

(Marks:1)

Vu-Topper RM

The linear equation: $2x+0y-2=0$ has ----- solution/solutions.

A. Unique

Page 48

- B. no solution
- C. infinite many
- D. finite many

Question No:18

(Marks:1)

Vu-Topper RM

Under elimination methods, we consider, Gaussian elimination and ...methods.

- A. Gauss-Seidel
- B. Jacobi

C. Gauss-Jordan elimination

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D. None of the given choices

Question No:19

(Marks:1)

Vu-Topper RM

Which of the following method is not an iterative?

- A. Jacobi's method
- B. Gauss-Seidel method
- C. Relaxation methods

D. Gauss-Jordan method

ok

Question No:20

(Marks:1)

Vu-Topper RM

An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero.

A. TRUE

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B. FALSE

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ok

Question No:21

(Marks:1)

Vu-Topper RM

Exact solution of $2/3$ is not existing.

A. TRUE

B. FALSE

Question No:22

(Marks:1)

Vu-Topper RM

When the condition of diagonal dominance becomes true in Jacobi's Method. Then it means that the method is

A. Stable

B. Unstable

C. Convergent

Page 70

ok

D. Divergent

Question No:23

(Marks:1)

Vu-Topper RM

Gauss-Seidel method is similar to

A. Iteration's method

B. Regula-Falsi method

C. Jacobi's method

D. None of the given choices

Page 263

ok

Question No:24

(Marks:1)

Vu-Topper RM

Sparse matrices arise in computing the numerical solution of

A. Ordinary differential equations

B. Partial differential equations

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ok

C. Linear differential equations

D. Non-linear differential equations

Question No:25

(Marks:1)

Vu-Topper RM

While solving by Gauss-Seidel method, which of the following is the first

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Iterative solution for the system; $x-2y=1$, $x+4y=4$?

A. (1, 0.75) ok

B. (0,0)

C. (1,0)

D. (0,1)

Question No:26

(Marks:1)

Vu-Topper RM

While solving a system of linear equations by Gauss Jordan Method, after all the elementary row operations if there lefts also zeros on the main diagonal then which of the is true about the system?

A. System may have unique solutions

B. System has no solution

C. System may have multiple numbers of finite solutions

D. System may have infinite many solutions ok

Question No:27

(Marks:1)

Vu-Topper RM

Numerical methods for finding the solution of the system of equations are classified as direct and methods

A. Indirect

B. Iterative Page 48

C. Jacobi

D. None of the given choices

Question No:28

(Marks:1)

Vu-Topper RM

If the Relaxation method is applied on the system; $2x+3y=1$, $3x+2y=-4$, then largest residual in 1st iteration will reduce to -----.

A. Zero ok

B. 4

C. -1

D. -1

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Question No:29

(Marks:1)

Vu-Topper RM

While using Relaxation method, which of the following is the Residuals for 1st iteration on the system; $2x+3y = 1$, $3x + 2y = 4$?

- A. (2,3)
- B. (3,-2)
- C. (-2,3)
- D. (1,4)

ok

Question No:30

(Marks:1)

Vu-Topper RM

If the order of coefficient matrix corresponding to system of linear equations is 33 then which of the following will be the orders of its decomposed matrices; 'L' and 'U'?

- A. Order of 'L' = 31, Order of 'U' = 13
- B. Order of 'L' = 32, Order of 'U' = 2*3
- C. Order of 'L' = 33, Order of 'U' = 33
- D. Order of 'L' = 34, Order of 'U' = 43

Question No:31

(Marks:1)

Vu-Topper RM

While solving the system; $x-2y = 1$, $x+4y = 4$ by Gauss-Seidel method, which of the following ordering is feasible to have good approximate solution?

- A. $x+4y = 1$, $x-2y = 4$
- B. $x+2y = 1$, $x-4y = 4$
- C. $x+4y = 4$, $x-2y = 1$
- D. No need to reordering

ok

Question No:32

(Marks:1)

Vu-Topper RM

While solving the system; $x-2y = 1$, $x+4y = 4$ by Gauss-Seidel method, which of the following ordering is feasible to have good approximate solution?

- A. Complicated
- B. Easiest

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Question No:33

(Marks:1)

Vu-Topper RM

Full pivoting, in fact, is more ...than the partial pivoting.

A. Easiest

B. Complicated

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Question No:34

(Marks:1)

Vu-Topper RM

For the equation $X^3 + 3x - 1 = 0$ the root of the equation lies in the interval...

A. (1, 3)

B. (1, 2)

C. (0, 1)

D. (1, 2)

Question No:35

(Marks:1)

Vu-Topper RM

lies in the category of iterative method.

A. Bisection Method

B. Regula Falsi Method

C. Secant Method

D. **All**

Page 8

Question No:36

(Marks:1)

Vu-Topper RM

If $n \times n$ matrices A and B are similar, then they have the different eigenvalues (with the same multiplicities).

A. TRUE

B. FALSE

Question No:37

(Marks:1)

Vu-Topper RM

The Jacobi's method is a method of solving a matrix equation on a matrix that has ____ zeros along its main diagonal.

No

Page 892

ok

At

least one

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Question No:38

(Marks:1)

Vu-Topper RM

To apply Simpson's $3/8$ rule, the number of intervals in the following must be

- A. 10
- B. 11
- C. **12**
- D. 13

Question No:39

(Marks:1)

Vu-Topper RM

The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric _____ definite matrices A.

- A. **Positive** ok
- B. negative

Question No:40

(Marks:1)

Vu-Topper RM

Differences methods find the _____ solution of the system.

- A. **Numerical** ok
- B. Analytical

Question No:41

(Marks:1)

Vu-Topper RM

To apply Simpson's $1/3$ rule, the number of intervals in the following must be

- A. **2** **Simpson rule**
- B. 3
- C. 5
- D. 7

Question No:42

(Marks:1)

Vu-Topper RM

Bisection and false position methods are also known as bracketing method and are always

- A. Divergent

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Question No:43

(Marks:1)

Vu-Topper RM

The Inverse of a matrix can only be found if the matrix is.

- A. Singular
- B. **None Singular**
- C. Scalar
- D. Diagonal

Question No:44

(Marks:1)

Vu-Topper RM

In interpolation is used to represent the δ Forward difference Δ

- A. **Central difference** Page 117
- B. Backward difference

Question No:45

(Marks:1)

Vu-Topper RM

The base of the decimal system is _____

- A. **10**
- B. 0
- C. 2
- D. 8

Question No:46

(Marks:1)

Vu-Topper RM

Bisection method is ... method

- A. Open Method
- A. **Bracketing Method** Page 26

Question No:47

(Marks:1)

Vu-Topper RM

A 3 x 3 identity matrix have three and _____ eigen values.

- A. **Same** ok
- B. different

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Question No:48

(Marks:1)

Vu-Topper RM

Eigenvalues of a symmetric matrix are all _____.

- A. complex
- B. zero
- C. Real
- D. positive

Page 104

ok

Question No:49

(Marks:1)

Vu-Topper RM

The Jacobi iteration converges, if A is strictly diagonally dominant.

- A. TRUE
- B. FALSE

Page 69

ok

Question No:50

(Marks:1)

Vu-Topper RM

Below are all the finite difference methods EXCEPT _____.

- A. jacobi's method
- B. Newton's backward difference method
- C. Stirling formula
- D. Forward difference method

Question No:51

(Marks:1)

Vu-Topper RM

Two matrices with the same characteristic polynomial need not be similar.

- A. TRUE
- B. FALSE

ok

Question No:52

(Marks:1)

Vu-Topper RM

The determinant of a diagonal matrix is the product of the diagonal elements.

- A. TRUE
- B. FALSE

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Question No:53

(Marks:1)

Vu-Topper RM

The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric positive definite matrices A.

A. TRUE

B. FALSE

Question No:54

(Marks:1)

Vu-Topper RM

The determinant of a _____ matrix is the product of the diagonal elements.

A. Diagonal

Page 70

ok

B. Upper triangular

C. Lower triangular

D. Scalar

Question No:55

(Marks:1)

Vu-Topper RM

For differences methods we require the set of values.

A. TRUE

ok

B. FALSE

Question No:56

(Marks:1)

Vu-Topper RM

If x is an eigen value corresponding to eigen value of V of a matrix A . If a is any constant, then $x - a$ is an eigen value corresponding to eigen vector V is an of the matrix $A - aI$.

A. TRUE

B. FALSE

Question No:57

(Marks:1)

Vu-Topper RM

Central difference method seems to be giving a better approximation; however, it requires more computations.

A. True

B. **False**

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Question No:58

(Marks:1)

Vu-Topper RM

Iterative algorithms can be more rapid than direct methods.

A. TRUE ok

B. FALSE

Question No:59

(Marks:1)

Vu-Topper RM

Central Difference method is the finite difference method.

A. TRUE ok

B. FALSE

Question No:60

(Marks:1)

Vu-Topper RM

The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its main diagonal.

A. TRUE Page 892

B. FALSE

Question No:61

(Marks:1)

Vu-Topper RM

Power method is applicable if the eigen vectors corresponding to eigen values are linearly independent.

A. TRUE Page 102 ok

B. FALSE

Question No:62

(Marks:1)

Vu-Topper RM

Power method is applicable if the eigen values are _____.

A. Real and Distinct Page 102

B. real and equal

C. positive and distinct

D. negative and distinct

Question No:63

(Marks:1)

Vu-Topper RM

Simpson's rule is a numerical method that approximates the value of a definite integral by using polynomials.

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A. Quadratic

Page 174

B. Linear

C. Cubic

D. Quartic

Question No:64

(Marks:1)

Vu-Topper RM

In Simpson's Rule, we use parabolas to approximating each part of the curve. This proves to be very efficient as compared to Trapezoidal rule.

A. TRUE

B. FALSE

Question No:65

(Marks:1)

Vu-Topper RM

The predictor-corrector method an implicit method. (multi-step methods)

A. TRUE

Page 212

B. FALSE

Question No:66

(Marks:1)

Vu-Topper RM

Generally, Adams methods are superior if output at many points is needed.

A. TRUE

B. FALSE

Question No:67

(Marks:1)

Vu-Topper RM

The Trapezoidal rule is a numerical method that approximates the value of a _____.

A. Indefinite integral

B. Definite integral

Page 176

C. Improper integral

D. Function

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Question No:68

(Marks:1)

Vu-Topper RM

The need of numerical integration arises for evaluating the definite integral of a function that has no explicit _____ or whose anti derivative is not easy to obtain.

A. Antiderivative

B. Derivatives

Question No:69

(Marks:1)

Vu-Topper RM

An indefinite integral may _____ in the sense that the limit defining it may not exist.

A. Diverge

B. Converge

Question No:70

(Marks:1)

Vu-Topper RM

An improper integral is the limit of a definite integral as an endpoint of the interval of integration approaches either a specified real number or ∞ or $-\infty$ or, in some cases, as both endpoints approach limits.

A. TRUE

B. FALSE

Question No:71

(Marks:1)

Vu-Topper RM

While using Relaxation method, which of the following is the Residuals for 1st iteration on the system; $2x + 3y = 1$, $3x + 2y = 4$?

A. (2,3)

B. (1,4)

C. (4,4)

D. (3,4)

Question No:72

(Marks:1)

Vu-Topper RM

For the system of equations; $x = 2$, $y = 3$. The inverse of the matrix associated with its coefficients is-----.

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A. Singular

B. Non-singular

C. Non identity

Question No:73

(Marks:1)

Vu-Topper RM

The number of significant digits in the number 608.030060 is:

A. 7

B. 8

C. 9

D. 1

Question No:74

(Marks:1)

Vu-Topper RM

For two matrices A and B, such that "A = Inverse of B", then which of the following is true?

A. B=Inverse of A

B. A and B are not-singular

C. AB=Identity Matrix

D. All choice is true

Question No:75

(Marks:1)

Vu-Topper RM

If a system of equations has a property that each of the equation possesses one large coefficient and the larger coefficients in the equations correspond to different unknowns in different equations, then which of the following iterative method is preferred to apply?

A. Gauss-Seidel method

B. Gauss-Jordon method

C. Gauss elimination

ok

D. Croat's method

Question No:76

(Marks:1)

Vu-Topper RM

Two matrices with the __ characteristic polynomial need not be similar.

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A. Same

B. different

Question No:77

(Marks:1)

Vu-Topper RM

Which of the following method is simplest one to integrate numerically a given tabular function but give more error?

A. Rectangular method

B. Trapezoidal method

C. Simpson's 1/3 Rule

D. Simpson's 3/8 Rule

Question No:78

(Marks:1)

Vu-Topper RM

At which of the following points the Minimum value of 2nd derivative of function $f(x) = -(2/x)$ in the interval: $[1,4]$ exists?

A. At $x=1$

B. At $x=2$

C. At $x=3$

D. At $x=4$

Question No:79

(Marks:1)

Vu-Topper RM

The Gaussian elimination method fails if any one of the pivot elements becomes.....?

A. Zero

B. One

C. Two

D. Five

Question No:80

(Marks:1)

Vu-Topper RM

Gauss elimination and Gauss-Jordan methods are popular among many methods for finding theof a matrix.

A. Identity

B. Transpose

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C. Inverse ok

D. None of the given choices

Question No:81

(Marks:1)

Vu-Topper RM

In Gauss-Seidel method, each equation of the system is solved for the unknown with ----- coefficient, in terms of remaining unknowns.

A. Largest ok

B. Smallest

C. Any positive

D. any negative

Question No:82

(Marks:1)

Vu-Topper RM

Power method is applicable if the Eigen vectors corresponding the Eigen values are linearly

A. Dependent

B. Independent

Page 6

Question No:83

(Marks:1)

Vu-Topper RM

Power method is applicable if the Eigen values are real and distinct.

A. False

B. True

Page 102

Question No:84

(Marks:1)

Vu-Topper RM

The Power method can be used only to find the eigenvalue of A that is largest in absolute value—we call this eigenvalue the dominant eigenvalue of A.

A. False

B. True

ok

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Question No:85

(Marks:1)

Vu-Topper RM

If x is an eigenvalue corresponding to eigenvalue of V of a matrix A . If a is any constant, then $x - a$ is an eigen value corresponding to eigen vector V is an of the matrix $A - a I$.

A. False

B. True

Question No:86

(Marks:1)

Vu-Topper RM

The dominant or principal eigenvector of a matrix is an eigenvector corresponding to the Eigen value of largest magnitude (for real numbers, largest absolute value) of that matrix,

A. False

B. True

Question No:87

(Marks:1)

Vu-Topper RM

Eigen values of a _____ matrix are all real.

A. Antisymmetric

B. Symmetric

C. Rectangular

D. Triangular

Question No:88

(Marks:1)

Vu-Topper RM

In Trapezoidal rule, the integral is computed on each of the sub-intervals by using linear interpolating formula, ie. For $n=1$ and then summing them up to obtain the desired integral.

A. False

B. True

Question No:89

(Marks:1)

Vu-Topper RM

In Runge – Kutta Method, we do not need to calculate higher order derivatives and find greater accuracy.

A. False

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B. True

Question No:90

(Marks:1)

Vu-Topper RM

The Trapezoidal Rule is an improvement over using rectangles because we have much less "missing" from our calculations. We used _____ to model the curve in trapezoidal Rule.

A. Straight lines

B. curves

C. parabolas

D. constant

Question No:91

(Marks:1)

Vu-Topper RM

Euler's Method numerically computes the approximate derivative of a function.

A. False

B. True

Question No:92

(Marks:1)

Vu-Topper RM

Euler's Method numerically computes the approximate _____ of a function.

A. Antiderivative

B. Derivative

C. Error

D. Value

Question No:93

(Marks:1)

Vu-Topper RM

If we wanted to find the value of a definite integral with an infinite limit, we can instead replace the infinite limit with a variable, and then take the limit as this variable goes to _____.

A. Constant

B. Finite

C. Infinity

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D. Zero

Question No:94

(Marks:1)

Vu-Topper RM

The Jacobi iteration _____, if A is strictly diagonally dominant.

A. Converges **ok**

B. diverges

Question No:95

(Marks:1)

Vu-Topper RM

By using determinants, we can easily check that the solution of the given system of linear equation exists and it is unique.

A. False

B. True **ok**

Question No:96

(Marks:1)

Vu-Topper RM

Direct method can more rapid than iterative algorithms

A. False

B. True

Question No:97

(Marks:1)

Vu-Topper RM

The dominant eigenvector of a matrix is an eigenvector corresponding to the eigenvalue of largest magnitude (for real numbers, smallest absolute value) of that matrix.

A. False

B. True

Question No:98

(Marks:1)

Vu-Topper RM

The central difference method is finite difference method.

A. False

B. True

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Question No:99

(Marks:1)

Vu-Topper RM

The absolute value of a determinant ($|\det A|$) is the product of the absolute values of the eigenvalues of matrix A

A. False

B. True ok

Question No:100

(Marks:1)

Vu-Topper RM

Eigenvectors of a symmetric matrix are orthogonal, but only for distinct eigenvalues.

A. False

B. True

Question No:101

(Marks:1)

Vu-Topper RM

6. Let A be an $n \times n$ matrix. The number x is an eigenvalue of A if there exists a non-zero vector v such that $Av = xv$

A. $Av = xv$

B. $Ax = xv$ ok

C. $Av + xv = 0$

D. $Av = Ax$

Question No:102

(Marks:1)

Vu-Topper RM

In Jacobi's Method, the rate of convergence is quite _____ compared with other methods.

A. Slow ok

B. Fast

Question No:103

(Marks:1)

Vu-Topper RM

Numerical solution of $2/3$ up to four decimal places is _____.

A. 0.667

B. 0.6666

C. 0.6667 ok

D. 0.66667

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Question No:104

(Marks:1)

Vu-Topper RM

Euler's method is only useful for a few steps and small step sizes; however, Euler's method together with Richardson extrapolation may be used to increase the _____.

A. Order and accuracy

B. Divergence

Question No:105

(Marks:1)

Vu-Topper RM

The first langrage polynomial with equally spaced nodes produced the formula for _____.

A. Simpson's rule

B. Trapezoidal rule

C. Newton's method

D. Richardson's method

Question No:106

(Marks:1)

Vu-Topper RM

The need of numerical integration arises for evaluating the indefinite integral of a function that has no explicit antiderivative or whose antiderivative is not easy to obtain.

A. False

B. True

Question No:107

(Marks:1)

Vu-Topper RM

The Euler method is numerically unstable because of _____ convergence of error.

A. Slow

B. Fast

C. Moderate

D. No

Question No:108

(Marks:1)

Vu-Topper RM

Adams – Bash forth is a multistep method.

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A. False

B. True

Question No:109

(Marks:1)

Vu-Topper RM

Multistep method does not improve the accuracy of the answer at each step.

A. False

B. True

Question No:110

(Marks:1)

Vu-Topper RM

Generally, Adams methods are superior if output at _____ points is needed.

A. Many

B. Two

C. Single

D. At most

Question No:111

(Marks:1)

Vu-Topper RM

Symbol used for forward differences is

A. ∇

B. Δ

C. δ

D. μ

Page 12

Question No:112

(Marks:1)

Vu-Topper RM

The relationship between central difference operator and the shift operator is given by

A. $\delta = E - E^{-1}$

B. $\delta = E + E^{-1}$

C. $\delta = E^{1/2} + E^{-1/2}$

D. $\delta = E^{1/2} - E^{-1/2}$

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Question No:113

(Marks:1)

Vu-Topper RM

Muller's method requires -----starting points

A. 1

B. 3 **Page 41**

C. 2

D. 4

Question No:114

(Marks:1)

Vu-Topper RM

If we retain $r+1$ terms in Newton's forward difference formula, we obtain a polynomial of degree ---- agreeing with y_x at $x_0, x_1, \dots, x_n$.

A. $r+2$

B. r

C. $r+1$

D. $r-1$

Question No:115

(Marks:1)

Vu-Topper RM

Octal number system has the base -----

A. 2

B. 10

C. 8

D. 16

Question No:116

(Marks:1)

Vu-Topper RM

Rate of change of any quantity with respect to another can be modeled by

A. An ordinary differential equation

B. A partial differential equation

C. A polynomial equation

D. None of the given choices

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Question No:117

(Marks:1)

Vu-Topper RM

Adam-Moulton P-C method is derived by employing

- A. Newton's backward difference interpolation formula**
- B. Newton's forward difference interpolation formula
- C. Newton's divided difference interpolation formula
- D. None of the given choices

Question No:118

(Marks:1)

Vu-Topper RM

Newton Raphson method is method

- A. Bracketing Method
- B. Open**
- C. Random
- D. none

Question No:119

(Marks:1)

Vu-Topper RM

Eigenvalue is

- A. Real**
- B. Vector
- C. odd
- D. even

Question No:120

(Marks:1)

Vu-Topper RM

Bisection and false position methods are also known as

- A. bracketing method**
- B. open method
- C. random

Question No:121

(Marks:1)

Vu-Topper RM

If $f(x)$ contains trigonometric, exponential or logarithmic functions then this equation is known as

- A. Transcendental equation**
- B. Algebraic

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- C. Polynomial
- D. Linear

Question No:122

(Marks:1)

Vu-Topper RM

In interpolation δ is used to represent the

- A. Forward difference
- B. Central difference**
- C. Backward difference

Question No:123

(Marks:1)

Vu-Topper RM

P in Newton's forward difference formula is defined as

- A. $P=(x-x_0)/h$**
- B. $P=(x+x_0)/h$
- C. $P=(x+x_n)/h$
- D. $P=(x-x_n)/h$

Question No:124

(Marks:1)

Vu-Topper RM

Newton's divided difference interpolation formula is used when the values of the are

- A. Equally spaced**
- B. Not equally spaced
- C. Constant
- D. None of the above

Question No:125

(Marks:1)

Vu-Topper RM

Given the following data

X	0	1	2	4
F(x)	1	1	2	5

The value of $f(2,4)$ is

- A. 1.5

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B. 2

C. 3

D. 1

Question No:126

(Marks:1)

Vu-Topper RM

They can be used only to find the Eigen value of A that is largest in absolute value—we call this Eigen value the dominant Eigen value of A.

A. False

B. True

Question No:127

(Marks:1)

Vu-Topper RM

If the order of coefficient matrix corresponding to system of linear equations is 3×3 then which of the following will be the orders of its decomposed matrices; 'L' and 'U'?

A. Order of 'L' = 3×1 , Order of 'U' = 1×3

B. Order of 'L' = 3×2 , Order of 'U' = 2×3

C. Order of 'L' = 3×3 , Order of 'U' = 3×3 **ok**

D. Order of 'L' = 3×4 , Order of 'U' = 4×3

Question No:128

(Marks:1)

Vu-Topper RM

For the equation $x^2 + 3x - 1 = 0$, the root of the equation lies in the interval.....

A. (1, 3)

B. (1, 2)

C. (0, 1)

D. (1, 2)

Question No:129

(Marks:1)

Vu-Topper RM

If the root of the given equation lies between a and b, then the first approximation to the root of the equation by bisection method is

A. $\frac{a+b}{2}$

B. $\frac{a-b}{2}$

C. $\frac{b-a}{2}$

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D. None of the given options

Question No:130

(Marks:1)

Vu-Topper RM

Let A be an $n \times n$ matrix. The number x is an eigenvalue of A if there exists a non-zero vector v such that _____.

A. $Av = xv$

B. $Av + xv = 0$

C. $Av = Ax1$

D. $Av = \lambda v$ ok

Question No:131

(Marks:1)

Vu-Topper RM

By using determinants, we can easily check that the solution of the given system of linear equation _____ and it is _____.

A. Exits, unique

B. Exists, consistent

C. Trivial, unique

D. Non trivial, inconsistent

Question No:132

(Marks:1)

Vu-Topper RM

In method, the elements above and below the diagonal are simultaneously made zero.

A. Jacobi's

B. Gauss-Seidel

C. Gauss-Jordan Elimination

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ok

D. Relaxation

Question No:133

(Marks:1)

Vu-Topper RM

Which of the following is equivalent form of the system of equations in matrix form; $AX=B$?

A. $XA = B$

B. $X = B$ (Inverse of A) ok

C. $X = (\text{Inverse of } A)B$

D. $BX = A$

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Question No:134

(Marks:1)

Vu-Topper RM

If the determinant of a matrix A is not equal to zero then the system of equations will have.....

- A. A unique solution**
- B. Many solutions
- C. Infinite many solutions
- D. None of the given choices

Question No:135

(Marks:1)

Vu-Topper RM

Sparse matrix is a matrix with

- A. Some elements are zero
- B. Many elements are zero**
- C. Some elements are one
- D. Many elements are one

Page 69

ok

Question No:136

(Marks:1)

Vu-Topper RM

How many Eigen vectors will exist corresponding to the function;
 $\text{Exp}(ax) = e^{ax}$, when the matrix operator is of differentiation?

- A. Infinite many**
- B. Finite Multiple
- C. None

ok

Question No:137

(Marks:1)

Vu-Topper RM

Which of the following is the meaning of partial pivoting while employing the row transformations?

- A. Making the largest element as pivot**
- B. Making the smallest element as pivot
- C. Making any element as pivot
- D. Making zero elements as pivot

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Question No:138

(Marks:1)

Vu-Topper RM

Differences methods are iterative methods.

- A. False

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B. True

Question No:139

(Marks:1)

Vu-Topper RM

Eigenvalues of a _____ matrix are all real.

A. Symmetric

B. Anti-symmetric

C. Rectangular

D. Triangular

Question No:140

(Marks:1)

Vu-Topper RM

For a system of linear equations, the corresponding coefficient matrix has the value of determinant; $|A| = 0$, then which of the following is true?

A. The system has unique solution

B. The system has finite multiple solutions

C. The system has infinite may solutions

D. The system has no solution

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Question No:141

(Marks:1)

Vu-Topper RM

For the system; $2x+3y = 1$, $3x + 2y = -4$, if the iterative solution is $(0,0)$ and ' $dx_i = 2$ ' is the increment in ' y ' then which of the following will be taken as next iterative solution?

A. $(2,0)$

B. $(0,3)$

C. $(0,2)$

D. $(1,-4)$

ok

Question No:142

(Marks:1)

Vu-Topper RM

While using Relaxation method, which of the following is increment ' dx_i ' corresponding to the largest Residual for 1st iteration on the system; $2x+3y = 1$, $3x + 2y = -4$?

A. -2

B. 2

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C. 4 ok
D. 3

Question No:143 (Marks:1) **Vu-Topper RM**

If system of equations is inconsistent then its means that it has

A. No Solutions ok

B. Many solutions Infinite

C. Many solutions

D. None of the given choices

Question No:144 (Marks:1) **Vu-Topper RM**

Relaxation Method is a/an

A. Direct method

B. Iterative method ok

Question No:145 (Marks:1) **Vu-Topper RM**

The eigenvectors of a square matrix are the non-zero vectors that, after being multiplied by the matrix, remain to the original vector.

A. Perpendicular

B. Parallel ok

C. Diagonal

D. None of the given choices

Question No:146 (Marks:1) **Vu-Topper RM**

In Jacobi's method after finding D1, the sum of the diagonal elements of D1 should be to the sum of the diagonal elements of the original matrix A.

A. Greater than

B. Less than

C. Same Page 106

D. Different

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Question No:147

(Marks:1)

Vu-Topper RM

In interpolation is used to represent the d Forward difference?

A. Central difference

B. Backward difference

Question No:148

(Marks:1)

Vu-Topper RM

Power method is applicable if the eigen vectors corresponding to eigen values are linearly ----.

A. Independent

B. Dependent

Question No:149

(Marks:1)

Vu-Topper RM

Power method is applicable if the Eigen vector corresponding to pigeon values Ara linearly independent

A. False

B. True

Question No:150

(Marks:1)

Vu-Topper RM

In Jacobi method we assume that the _____ element does not vanish

A. Diagonal

B. off – Diagonal

C. Row

D. Column

Question No:151

(Marks:1)

Vu-Topper RM

In Jacobi method that rat off convergence is quit slow compared with other method

A. False

B. True

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Question No:152

(Marks:1)

Vu-Topper RM

White solving the system linear equation $x-y=2$, $-x+y=3$ By Jacobi method if $(0, 0)$ be first approximate solution then which of that following is second approximate solution

A. (2, 3)

B. $(0, 3)$

C. $(2, 0)$

Question No:153

(Marks:1)

Vu-Topper RM

The liner equation: $0x+0y = 2$ has _____ solution

A. unique

B. No solution

C. infinite many

D. finite many

Question No:154

(Marks:1)

Vu-Topper RM

When the condition of diagonal dominance become true in Jacobi method then it's means that the method is

A. stable

B. un- stable

C. Convergent

D. Divergent

Question No:155

(Marks:1)

Vu-Topper RM

A series $16+8+4+2+1$ is replaced by the series $16+8+4+2$ then it is called

A. inherent error

B. local round of error

C. local truncation error

Question No:156

(Marks:1)

Vu-Topper RM

If one root of the equal is $3-7i$, then the other root will be

A. $-3-7i$

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B. $-3+7i$

C. $3-7i$

D. $3+7i$

Question No:157

(Marks:1)

Vu-Topper RM

The number system that has a base 2 is called...system.

A. octal

B. Binary

C. Decimal

D. Hexadecimal

Question No:158

(Marks:1)

Vu-Topper RM

Which method required is derivative of that solution

A. Bisection method

B. Regular falsi method

C. Muller method

D. Newton Raphson method

Question No:159

(Marks:1)

Vu-Topper RM

If the Relaxation method is applied on the system $2x+3y=1$ $3x+2y=-4$ then largest residual in 1st iteration will reduce to

Select the correct option

A. Zero

B. 4

C. -1

D. -1

Question No:160

(Marks:1)

Vu-Topper RM

The number system that has a base 8 is called _ system

A. Decimal

B. Octal

C. Binary

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Question No:161

(Marks:1)

Vu-Topper RM

In Gauss Seidel method each equation of the system is solved for the unknown with _ coefficient in terms of remaining unknown

- A. smallest
- B. largest**
- C. any largest
- D. any negative

Question No:162

(Marks:1)

Vu-Topper RM

Which method is required a derivative of a solution?

- A. Regular falsi method
- B. Neuton Raphson method**
- C. Muller method
- D. Bisection method

Question No:163

(Marks:1)

Vu-Topper RM

If a system of equation has a property that each of the equation possesses one large coefficient in the equations correspond to different unknown in different equation then which of the following iterative method id preferred to apply?

- A. Crout s method
- B. Gauss Seidel method**
- C. Gauss – Jordan method
- D. Gauss elimination method

Question No:164

(Marks:1)

Vu-Topper RM

With the initial vector (0;0;0;) the residual would be

- A. $R_1 = 2, R_2 = 1, R_3 = 1$
- B. $R_1 = 1, R_2 = 3, R_3 = 2$
- C. $R_1 = 5, R_2 = 9, R_3 = 2$**
- D. $R_1 = 3, R_2 = 2, R_3 = 1$

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Question No:165

(Marks:1)

Vu-Topper RM

In full providing we interchange rows and columns such that the element in the matrix of the variable also get charged

A. largest

B. Middle

C. smallest

D. none of the given choice

Question No:166

(Marks:1)

Vu-Topper RM

For the system $2x+3y=1$ $3x + 2y = -4$ if the iterative solution is $(0 ; 0,)$ and $dx_i = 2$ is the increment in y then which of the following will be taken as next iterative so

A. $(0;3)$

B. $(0;2)$

C. $(1;4)$

D. $(2;0)$

Question No:167

(Marks:1)

Vu-Topper RM

If the determinant of the matrix A is equal to zero then the system of equation will have

A. No solution or infinitely many solution

B. unique solution

C. infinite many solution

D. no solution

The number system that has a base 16 is called...system.

Hexadecimal

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