## <u>Mth603 Solved MCQS for Final Term Exam</u>

Exact solution of 2/3 is not exists. TRUE FALSE

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

No	666
At least one	
At least one	
A 3 x 3 identity matrix have three andeiger	n values.
Same	
Different	
Eigenvalues of a symmetric matrix are all	
Real	
Complex	
Zero	
Positive	
$\sim$	
The Jacobi iteration converges, if A is strictly diagonall	y dominant.
TRUE	
FALSE	
Below are all the finite difference methods EXCEPT	•
Jacobi's method	
Newton's backward difference method	
Stirling formula	
Forward difference method	
If n yn matuices A and D are similar than they have th	a come sizenvalues (with the
If n x n matrices A and B are similar, then they have th	e same eigenvalues (with the
same multiplicities). TRUE	

FALSE

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

#### TRUE

FALSE

The characteristics polynomial of a 3x 3 Identity matrix is \_\_\_\_\_, if x is the **Eigen values of the given 3 x 3 identity matrix. Where symbol ^ shows power.** 

(X-1)^3 (x+1)^3 X^3-1 X^3+1

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

TRUE FALSE

#### **Bisection method is a**

Bracketing method Open method

#### **Regula Falsi means**

Method of Correct position Method of unknown position Method of false position Method of known position

Eigenvalues of a symmetric matrix are all . Select correct option:

Negative

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

TRUE FALSE Exact solution of 2/3 is not exists. Select correct option:

#### TRUE

FALSE

The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric 0,666 definite matrices A.

Select correct option:

**Positive** Negative

Differences methods find the \_\_\_\_\_ solution of the system Select correct option:

> **Numerical** Analytical

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. Select correct option:

TRUE FALSE

The Jacobi's method is a method of solving a matrix equation on a matrix that has no zerosalong its Select correct option:

Main diagonal Last column Last row First row

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

TRUE FALSE

334,0666 A 3 x 3 identity matrix have three and different Eigen values. Select correct option:

#### TRUE FALSE

Newton Raphson method falls in the category of

Bracketing method Open Method Iterative Method Indirect Method

#### Newton Raphson method is also known as

Tangent Method Root method **Open Method Iterative Method** 

#### Secant Method uses values for approximation

1 3 2

4

Second Method is than bisection method for finding root Slow Faster

#### In Newton Raphson method

Root is bracketed Root is not bracketed

#### Regula falsi method and bisection method are both

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#### Convergent

Divergent

#### In bisection method the two points between which the root lies are

Similar to each other Different Not defined Opposite

# 334,0666 In which methods we do not need initial approximation to start

Indirect Method Open Method Direct Method **Iterative Method** 

#### Root may be

Complex Real Complex or real None

#### In Regula falsi method we choose points that have signs

#### 2 points opposite signs 3 points opposite signs

2 points similar signs None of the given

#### In a bounded function values lie between

1 and -1 1 and 2

0 and 1

0 and -2

#### Newton Raphson method is a method which when it leads to division of number close to zero

Diverges Converges

#### Which of the following method is modified form of Newton Raphson Method?

Regula falsi method **Bisection method** Secant method

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Jacobi's Method

#### Which 1 of the following is generalization of Secant method?

Muller's Method Jacobi's Method Bisection Method N-R Method

#### Secant Method needs starting points

Near a simple root Muller's Method converges than the secant method

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#### Faster

Slower

If S is an identity matrix, then

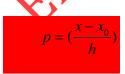
 $S^{-1} = S$  $S^{t} = S$  $S^{-1} = S^{t}$ 

All are true

If we retain r+1 terms in Newton's forward difference formula, we obtain a

r+2 r+1 R R-1

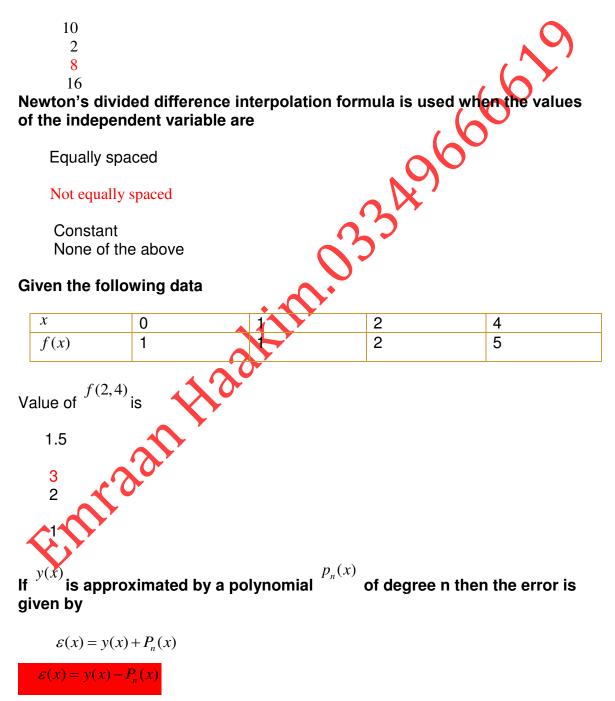
P in Newton's forward difference formula is defined as



 $p = (\frac{x + x_0}{h})$ 

$$p = \left(\frac{x + x_n}{h}\right)$$
$$p = \left(\frac{x - x_n}{h}\right)$$

Octal numbers has the base



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$$\begin{split} \varepsilon(x) &= y(x) \times P_n(x) \\ \varepsilon(x) &= P_n(x) + y(x) \end{split}$$
Let  $I$  denotes the closed interval spanned by  $x_0, x_1, x_2, x_3, x_4, x_5, x_6, x_7, \overline{x}$ . Then  $F(x)$  vanishes -----times in the interval  $I$ .  
N-1  
N+2  
N  
N+1  
Differential operator in terms of forward difference operator is given by  
 $D &= \frac{1}{h} (\Delta + \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} + \frac{\Delta^4}{4!} + \frac{\Delta^5}{5!} + ...)$   
 $D &= \frac{1}{h} (\Delta - \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} + \frac{\Delta^4}{4!} + \frac{\Delta^5}{5!} + ...)$   
 $D &= \frac{1}{h} (\Delta - \frac{\Delta^2}{2!} + \frac{\Delta^3}{3!} - \frac{\Delta^4}{4!} + \frac{\Delta^5}{5!} + ...)$   
Finding the first derivative of  $f(x)$  at  $x = 0.4$  from the following table:  
 $\boxed{x + \frac{Q_2}{f(x)} + \frac{Q_2}{Q_1!} + \frac{Q_2}{Q_2!} + \frac{Q_2}$ 

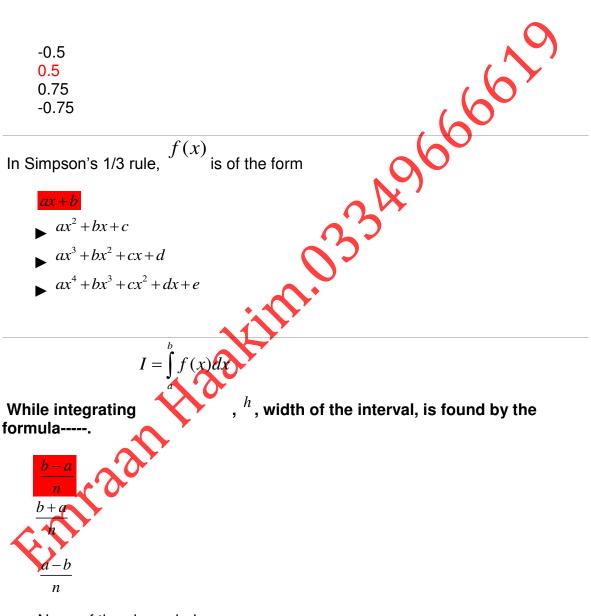
Forward difference operator Backward difference operator Central difference operator All of the given choices

#### For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
f(x)	0.425	0.475	0.400	0.452	0.525	0.575

f'(0.1)

, using two-point equation will be calculated as.....



None of the given choices

To apply Simpson's 1/3 rule, valid number of intervals are.....

#### For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
f(x)	0.425	0.475	0.400	0.452	0.525	0.575

*f*<sup>//</sup>(0.2)

, using three-point equation will be calculated as ..... 5 5 5

17.5 12.5 7.5

-12.5

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

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

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 .....



 $\frac{(b-a)}{2}$  None of the given choices

.....lies in the category of iterative method. **Bisection Method** Regula Falsi Method Secant Method All of the given choices For the equation  $x^{3}+3x-1=0$ , the root of the equation lies in the interval..... 334,966 (1, 3)(1, 2)(0, 1)(1, 2)Rate of change of any quantity with respect to another can be modeled by An ordinary differential equation A partial differential equation A polynomial equation None of the given choic lf = f(x, y)Then the integral of this equation is a curve in None of the given choices Xt-plane Yt-plane Xy-plane

#### In solving the differential equation

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y' = x + y; y(0.1) = 1.1h=0.1, By Euler's method y(0.2) is calculated as 1.44 1.11 1.22 1.33 334,0666 In second order Runge-Kutta method  $k_1$ is given by  $k_1 = hf(x_n, y_n)$  $k_1 = 2hf(x_n, y_n)$  $k_1 = 3hf(x_n, y_n)$ None of the given choices is given by  $k_2$ In fourth order Runge-Kutta method,  $k_2 = hf(x)$  $k_2 = hf(x)$  $k_4$ In fourth order Runge-Kutta method, is given by  $k_3 = hf(x_n + 2h, y_n + 2k_3)$  $k_3 = hf(x_n - h, y_n - k_3)$  $k_3 = hf(x_n + h, y_n + k_3)$ None of the given choices

#### Adam-Moulton P-C method is derived by employing

Newton's backward difference interpolation formula Newton's forward difference interpolation formula Newton's divided difference interpolation formula None of the given choices

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

**Derivatives** Antiderivative

#### If $|A| \neq 0$ then system will have a

Definite solution Unique solution Correct solution No solution

If |A| = 0 then

There is a unique solution There exists a complete solution There exists no solution None of the above options

#### Direct method consists of method

2

3 5

4

We consider Jacobi's method Gauss Seidel Method and relaxation method as Direct method Iterative method Open method

All of the above

#### In Gauss Elimination method Solution of equation is obtained in

3 stages

2 stages

4 stages

5 stages

#### Gauss Elimination method fails if any one of the pivot values becomes

Greater Small Zero None of the given

#### Changing the order of the equation is known as

Pivoting Interpretation

Full pivoting is than partial pivoting Easy More complicated

66667 The following is the variation of Gauss Elimination method

Jacobi's method Gauss Jordan Elimination method

#### Courts reduction method is also known as Cholesky Reduction method

True False

Jacobi's method is also known as method of Simultaneous displacement True

False

Gauss Seidel method is also known as method of Successive displacement False

True

#### In Jacobi's method approximation calculated is used for

Nothing

Calculating the next approximation Replaced by previous one

All above

In Gauss Seidel method approximation calculated is replaced by previous one Tru False

Relaxation method is derived by South well Not defined

Power method is applicable for only **Real metrics** 

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Symmetric Unsymmetrical Both symmetric and real

The process of eliminating value of y for intermediate value of x is know as interpolation

True False

In Richardson's extrapolation method, we usually use two different step sizes ......and ...... to yield a higher order method.

#### h, h/2

h, h/3 h, h/4 None

In Simpson's 3/8 rule, we divide the interval of integration into n sub-intervals. Where n is divisible by.....

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

TrueFalse

2- 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

**b** order and accuracy

divergence

3- The first lngrange polynomial with equally spaced nodes produced the formula for \_\_\_\_\_.

By.Mohammad Imraan Haakim 03349666619 emranhaakim@gmail.comSoftvission Collage of IT Bahawal pur ➢ Simpson's rule

#### Trapezoidal rule

- ➢ Newton's method
- Richardson's method

4- 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.

# TRUEFALSE

5- 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

#### straight lines

- ➤ curves
- ➢ parabolas
- ➤ constant

- > Slow
- ➤ Fast
- > Moderate
- > No
- 7- Adams Bashforth is a multistep method.

# **False**

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

Antiderivative
 Derivatives

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



10-An indefinite integral may \_\_\_\_\_\_ in the sense that the limit defining it 9600 at may not exist.



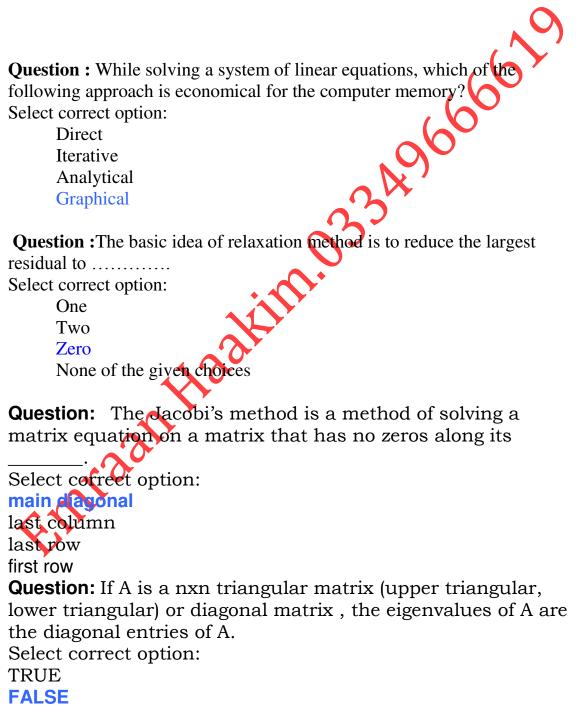
11-The Trapezoidal Rule is an improvement over using rectangles because we have much less "missing" from our calculations. We used \_\_\_\_\_\_ to model the curve in trapezoidal Rule.

inn.

```
straight lines
```

- ➤ curves
- > parabolas
- ➢ constant
- 12-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 8 or -8 or, in some cases, as both endpoints approach limits.
  - ≻ True 🥻
  - > False
- 13-Euler's Method numerically computes the approximate derivative of a function.
  - True
  - ➤ False
- 14-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 \_\_\_\_\_.

- > Constant
- ➤ Finite
- ➤ Infinity
- ➤ zero



Question : A 3 x 3 identity matrix have three and different eigen values. Select correct option: TRUE FALSE

**Question :** 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 A96666 possible? Select correct option: Associated coefficient matrix is singular All values of l's and u's can't be evaluated Determinant of coefficient matrix is zero All are equivalent Question : Gauss - Jordan Method is similar to Select correct option: Gauss–Seidel method Iteration's method **Relaxation Method** Gaussian elimination met **Ouestion**: While using Relaxation method, which of the following is the

largest Residual for 1st iteration on the system; 2x+3y = 1, 3x + 2y = -4? Select correct option.



**Question :** Gauss–Seidel method is also known as method of ...... Select correct option:

Successive displacement Iterations False position None of the given choices

**Question** : Jacobi's Method is a/an..... Select correct option:

Iterative method

Direct method

**Question :** The characteristics polynomial of a 3x 3 identity matrix is \_\_\_\_\_, if x is the eigen values of the given 3 x 3 identity matrix. where symbol ^ shows power. Select correct option:

 $(x-1)^3$ (x+1)^3 x^3-1 x^3+1

6661 Question : 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

Select correct option:

TRUE

FALSE

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

Select correct option:

Jacobi's

Gauss-Seidel

Relaxation

Gaussian elimination

**Question :** The linear equation: 2x+0y-2=0 has ------ solution/solutions. Select correct option:

unique no solution infinite many finite many

**Question :** Under elimination methods, we consider, Gaussian elimination and .....methods. Select correct option:

Gauss-Seidel Jacobi Gauss-Jordan elimination None of the given choices

**Question :** Which of the following method is not an iterative method? Select correct option: 6667

Jacobi's method Gauss-Seidel method Relaxation methods Gauss-Jordan elimination method

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

Select correct option: TRUE FALSE

**Question :** Exact solution of  $2\sqrt{3}$  is not exists. Select correct option: TRUE

FALSE

**Question** : When the condition of diagonal dominance becomes true in Jacobi's Method Fhen its means that the method is ..... Select correct option:

Stable Unstable Convergent Divergent

Question : Gauss–Seidel method is similar to ..... Select correct option:

Iteration's method Regula-Falsi method Jacobi's method None of the given choices

**Ouestion**: Sparse matrices arise in computing the numerical solution of

. . . . . . . . . . . . . . . . Select correct option:

Ordinary differential equations Partial differential equations Linear differential equations Non-linear differential equations

34,666 Question : While solving by Gauss-Seidel method, which of the following is the first Iterative solution for the system; x-2y = 1, x+4y=4? sti Haakin Select correct option:

(1, 0.75)

- (0,0)
- (1,0)
- (0,1)

Question: While Solving a system of linear equations by Gauss Jordon 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? Select correct option:

System may have unique solutions System has no solution System may have multiple numbers of finite solutions System may have infinite many solutions

**Question:** Numerical methods for finding the solution of the system of equations are classified as direct and ..... methods Select correct option:

Indirect Iterative Jacobi None of the given choices

**Question**: If the Relaxation method is applied on the system;  $2x+3y \neq 1, 3x$ +2y = -4, then largest residual in 1st iteration will reduce to -----666 Select correct option:

zero

4

-1

-1

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

Select correct option:

(2,3)

(3, -2)

(-2,3)

(1,4)

**Question :** 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'?

Select correct option Order of 'L' = 3\*1, Order of 'U' = 1\*3Order of 'L' = 3\*2 Order of 'U' = 2\*3Order of 'L' = 3 Order of 'U' = 3\*3 Order of 'L' = 3\*4, Order of 'U' = 4\*3

**Question** 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?

Select correct option:

x+4y = 1, x-2y = 4x+2y = 1, x-4y = 4x+4y = 4, x-2y = 1no need to reordering

**Question :** Full pivoting, in fact, is more .....than the partial pivoting. Select correct option:

Easiest Complicated

A96666 Question : Gauss-Seidel method is also known as method of ... Select correct option: Successive displacement Iterations False position None of the given choices =0 , the root of the equation lies in the interval..... ► (1, 3) ► (1, 2) ► (0, 1) ► (1, 2) Ties in the category of iterative method. Question :-Bisection Method Regula Falsi Method Secant Method all of the given choices

**Question** : Power method is applicable if the eigen vectors corresponding to eigen values are linearly independent. True

1. false

# **Question:** A 3 x 3 identity matrix have three and different eigen values.

1. True

**Question :** If n x n matrices A and B are similar, then they have the different eigenvalues (with the same multiplicities).

#### 1. True False

**Question :** The Jacobi's method is a method of solving a matrix equation on a matrix that has \_\_\_\_\_zeros along its main diagonal.

#### No

1. At least one

**Question** : An eigenvector V is said to be normalized if the coordinate of largest magnitude is

equal to \_\_\_\_\_.

#### Unity

1. zero

**Question :** 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+b) (a-b) (b-a) (b-a) 2 (b-a)None of the given choices

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

#### ▶ 10

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- ▶ 11▶ 12
- ▶ 13

**Question :** The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric\_\_\_\_\_ definite matrices A. Select correct option:

#### positive

negative

**Question :** Differences methods find the \_\_\_\_\_\_ solution of the system.

Select correct option:

#### numerical

Analytical

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

> 2 (Simpson''s 1/3 rule must use an even number of

elements')

- ▶ 3
- ▶ 5
- ▶ 7

**Question** : 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. Select correct option:

**Question :** The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its \_\_\_\_\_. Select correct option:

#### main diagonal

last column last row first row

**Question** : Bisection and false position methods are also known as bracketing method and are always Divergent **Convergent** 

**Question** : The Inverse of a matrix can only be found if the matrix is Singular Every square non-singular matrix will have an inverse Scalar Diagonal **Question** : In interpolation is used to represent the Forward difference **Central difference** Backward difference **Question :** The base of the decimal system is \_ 10 0 2 8 None of the above. **Question** : Bisection method is ...... method ► Open Method ► Bracketing Method Question: Exact solution of 2/3 is not exists. TRUE FALSE **Question** : The Jacobi's method is a method of solving a matrix equation on a matrix that has zeros along its main diagonal. No atleast one

### **Question:** A 3 x 3 identity matrix have three and

\_eigen values.

#### same

different

**Question** : Eigenvalues of a symmetric matrix are all \_\_\_\_\_\_.

complex

zero

positive

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

#### TRUE

FALSE

**Question** : Below are all the finite difference methods EXCEPT

jacobi's method

newton's backward difference method

#### Stirlling formula

Forward difference method

**Question**: If n x n matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities). TRUE

#### FALSE

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

#### TRUE

FALSE

**Question:** The characteristics polynomial of a 3x 3 identity matrix is \_\_\_\_\_\_, if x is the eigen values of the given 3 x 3 identity matrix. where symbol ^ shows power.

 $(x-1)^{3}$  $(x+1)^{3}$ 

x^3-1

x^3+1

**Question** : Two matrices with the same characteristic polynomial need not be similar. TRUE FALSE

# **Question :** The determinant of a diagonal matrix is the product of the diagonal elements.

#### True

1. False

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

1. False

**Question** : The determinant of a \_\_\_\_\_ matrix is the product of the diagonal elements.

#### Diagonal

- 1. Upper triangular
- 2. Lower triangular
- 3. Scalar

**Question :** For differences methods we require the set of values.

values

True

False

**Question :** 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 - a I.

#### True

False

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

#### True False

**Question :** Iterative algorithms can be more rapid than direct methods.

#### True

1. False

**Question :** Central Difference method is the finite difference method.

True

#### 1. False

**Question :** Back substitution procedure is used in ..... Select correct option: **Gaussian Elimination Method** Jacobi's method Gauss-Seidel method None of the given choices **Question :** The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its main diagonal True False1. Question: The Jacobi's method is a method of solving a matrix equation of a matrix that h a s n o zeros along its main diagonal last column last row first row Question : . An eigenvector V is said to be normalized if the voordinate of largest magnitude is equal to\_ Unity Zero Question An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero. TRUE FALSE **Question** : . The Gauss-Seidel method is applicable to strictly diagonally dominant or s y m m e t r i c positive definite matrices A. True

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#### False

**Question :** The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric \_\_\_\_\_\_ definite matrices A.

#### PosItive

#### Negative

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

#### True

#### False1

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

#### True

False Question : Power method is applicable if the eigen values are

#### real and distinct

real and equal positive and distinct negative and distinct

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

#### Quadratic Linear Cubic

Quartic

**Question** : .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.

#### True

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False

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

#### True

#### False

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

#### True

False

**Question :** The Trapezoidal rule is a numerical method that approximates the value of a.\_\_\_\_\_.

Indefinite integral

#### Definite integral

Improper integral Function

**Question :** The need of numerical integration arises for evaluating the definite integral of a function that has no explicit \_\_\_\_\_\_ or whose antiderivative is not easy to obtain.

#### Anti deri vat ive

Derivatives.

Question : . An indefinite integral may \_\_\_\_\_ in the sense that the limit defining it may not exist.

#### diverge

Converge

Question: 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  $\infty$  or  $-\infty$  or, in some cases, as both endpoints approach limits.

#### TRUE

FALSE

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

TRUE
FALSE
Question :. Euler's Method numerically computes
the approximate of a function.
Antiderivative
Derivative
Error
Value
Question: 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
Chose the correct option :
Constant
Finite
Infinity
Zero
Question : Euler's Method numerically computes the
approximate derivative of a function.
TRUE
FALSE
Question: The Jacobi iteration, if A is
strictly diagonally dominant.
stilletin ulugonully dominunt.
COnverges
Diverges
Question :. Two matrices with the same characteristic
polynomial need not be similar.
TRUE
fALSE

Question :. Differences methods find the \_\_\_\_\_ solution of the system. Numerical Analytica Question : . By using determinants, we can easily check that the solution of the given system of linear equation exits and it is unique. TRUE FALSE

**Question :** The absolute value of a determinant (ldetAl) is the product of the absolute values of the eigen values of matrix A

#### TRUE

FALSE

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

#### TRUE

FALSE

**Question** : Let A be an a matrix. The number x is an eigenvalue of A if there exists a non-zerovector v such that \_\_\_\_\_.

Av = xv Ax = xv not show Av + xv=0 Av = Ax1 **Question**: In Jacobi's Method, the rate of convergence is quite \_\_\_\_\_ compared with other methods.

#### slow

Fast

**Question** : .Numerical solution of 2/3 up to four decimal places is \_\_\_\_\_.

```
0.667
0.6666
0.6667
0.666671.
Question : Symbol used for forward
differences is
\Delta Correct
δ
μ
Question : . The relationship between central
difference operator and the shift operarokis given by
                               03340
\delta = E - E^{-1}
\delta = E + E^{-1}
\delta = E 1 / 2 + E^{1 / 2}
\delta = E^{-1} / 2 - E^{-1} / 2
Question : Muller's mothod requires ------
starting points
1
2
3
Question: By using determinants, we can easily check that the solution of
the given system of linear equation _____ and it is _____.
Select correct option:
exits, unique
```

exists, consistent trivial, unique nontrivial, inconsistent

**Question :** Two matrices with the \_\_\_\_\_ characteristic polynomial need not be similar.

Select correct option: same different

slow t of t Question : In ..... method, the elements above and below the diagonal are simultaneously made zero.

Select correct option: Jacobi's Gauss-Seidel Gauss-Jordon Elimination Relaxation

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

Kim Select correct option: XA = BX = B(Inverse of A)X = (Inverse of A)BBX = AQuestion : If the determinant of a matrix A is not equal to zero then the system of equations will have.....

Select correct option: a unique solution many solutions infinite many solutions None of the given choices **Question :** Sparse matrix is a matrix with .....

Select correct option: Some elements are zero Many elements are zero Some elements are one

Many elements are one

**Question :** An eigenvector V is said to be normalized if the coordinate of largest magnitude is equal to zero. Select correct option:

# TRUE FALSE

Question # 1 of 10 ( Start time: 11:14:39 PM ) Total Marks: 1 The Jacobi iteration , if A is strictly diagonally dominant. 266

Select correct option:

converges diverges

Question # 2 of 10 (Start time: 11:16:04 PM) Total Marks: 1 The Jacobi's method is a method of solving a matrix equation on a matrix that has \_\_\_\_\_ zeros along its main diagonal.

Select correct option:

No

atleast one

Question # 3 of 10 ( Start time: 11:17:14 PM ) Total Marks: 1 Power method is applicable if the eigen vectors corresponding to eigen values are linearly

Select correct option: independent dependent

Question # 4 of 10 (Start time: 11:17:42 PM) Total Marks: 1 Power method is applicable if the eigen values are

# Select correct option:

# real and distinct

real and equal positive and distinct negative and distinct

Question # 7 of 10 (Start time: 11:19:55 PM) Total Marks: 1 The determinant of a diagonal matrix is the product of the diagonal elements.

Select correct option: TRUE FALSE

x966601 Question # 8 of 10 (Start time: 11:21:14 PM) Total Marks: 1 For differences methods we require the set of values.

Select correct option: TRUE FALSE

Question # 10 of 10 (Start time: 11:23:55 PM) Total Marks: 1 Two matrices with the \_\_\_\_\_ characteristic polynomial need not be similar.

Select correct option: Same

different

(2,3)(3, -2)-2,8

Question # 1 of 10 Total Marks: 1 While using Relaxation method, which of the following is the Residuals for 1st iteration on the system; 2x+3y = 1, 3x + 2y = 4?

Select correct option:

Question # 2 of 10 (Start time: 11:14:32 PM) Total Marks: 1 Sparse matrices arise in computing the numerical solution of .....

Select correct option:

Ordinary differential equations **Partial differential equations** 

Linear differential equations Non-linear differential equations

# Question # 3 of 10 (Start time: 11:15:18 PM) Total Marks: 1 In ..... method, the elements above and below the diagonal are simultaneously made zero.

Select correct option: Jacobi's Gauss-Seidel **Gauss–Jordon Elimination** Relaxation

,66607 Question # 5 of 10 (Start time: 11:17:54 PM) Total Marks: 1 Which of the following is equivalent form of the system of equations in matrix form; AX=B? 2KIM.

Select correct option: XA = BX = B(Inverse of A)X =(Inverse of A)B BX = A

Question # 7 of 10 ( Start time: 11:20:24 PM ) Total Marks: 1 If the determinant of a matrix A is not equal to zero then the system of equations will haver.....

# Select correct option: A unique solution many solutions

infinite many solutions None of the given choices

# Question # 8 of 10 (Start time: 11:21:37 PM) Total Marks: 1 Sparse matrix is a matrix with .....

Select correct option: Some elements are zero

# Many elements are zero

Some elements are one Many elements are one

Question # 4 of 10 (Start time: 11:31:21 PM) Total Marks: 1 66667 Back substitution procedure is used in .....

Select correct option: **Gaussian Elimination Method** 

Jacobi's method Gauss-Seidel method None of the given choices

Question # 5 of 10 (Start time: 11:32:12 PM) Total Marks: 1 The linear equation: 2x+0y-2=0 has ------ solution/solutions.

# Select correct option:

# unique

no solution infinite many finite many

Question # 8 of 10 (Start time: 11:35:30 PM) Total Marks: 1 For a system of linear equations, the corresponding coefficient matrix has the value of determinant, |A| = 0, then which of the following is true?

# Select correct option;

The system has unique solution The system has finite multiple solutions The system has infinite may solutions

The system has no solution

Question # 9 of 10 (Start time: 11:36:21 PM) Total Marks: 1 For the system; 2x+3y = 1, 3x + 2y = -4, if the iterative solution is (0,0) and 'dxi = 2' is the increment in 'y' then which of the following will be taken as next iterative solution?

# Select correct option:

- (2,0)
- (0,3)

(0,2)(1,-4)

Question # 2 of 10 (Start time: 11:42:14 PM)Total Marks: 1 Which of the following method is not an iterative?

Select correct option: Gauss-Seidel method Iteration's method **Relaxation Method** Gauss Jordan method

6667 Question # 3 of 10 ( Start time: 11:43:46 PM)Total Marks 34 Sparse matrix is a matrix with .....

Select correct option:

Some elements are zero Many elements are zero Some elements are one

Many elements are one

Question # 4 of 10 (Start time: 1.44:33 PM)Total Marks: 1 While using Relaxation method, which of the following is the Residuals for 1st iteration on the system, 2x+3y = 1, 3x + 2y = 4

# Select correct option:

(2,3)(3, -2)

(-2,3)(1,4)

Question # 6 of 10 (Start time: 11:47:15 PM)Total Marks: 1 Relaxation Method is a/an .....

Select correct option:

Direct method Iterative method

# Question # 9 of 10 (Start time: 11:50:33 PM)Total Marks: 1 Full pivoting, in fact, is more .....than the partial pivoting.

Select correct option: Easiest Complicated

96666 Question # 10 of 10 (Start time: 11:51:55 PM)Total Marks: 1 Gauss–Seidel method is also known as method of .....

Select correct option: Successive displacement

# **Iterations**

False position None of the given choices

Question # 2 of 10 (Start time: 11:31:28 PM) Total Marks: 1 Iterative algorithms can be more rapid than direct methods.

Select correct option: FALSE TRUE

Question # 3 of 10 (Start time: 11:32:02 PM) Total Marks: 1 Below are all the finite difference methods EXCEPT \_\_\_\_\_.

akim

Select correct option: jacobi's method newton's backward difference method Stirling formula Forward difference method

Question # 2 of 10 Total Marks: 1 Sparse matrices arise in computing the numerical solution of .....

Select correct option: Ordinary differential equations Partial differential equations Linear differential equations

Non-linear differential equations

# Question # 9 of 10

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 - a I.

Select correct option: TRUE FALSE

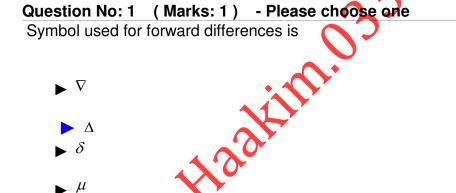
Question # 10 of 10 An eigenvector V is said to be normalized if the coordinate of large 66 magnitude is equal to zero.

Select correct option: TRUE FALSE

 $\blacktriangleright$   $\nabla$ 

 $\blacktriangleright$   $\mu$ 

 $\Delta$  $\delta$ 



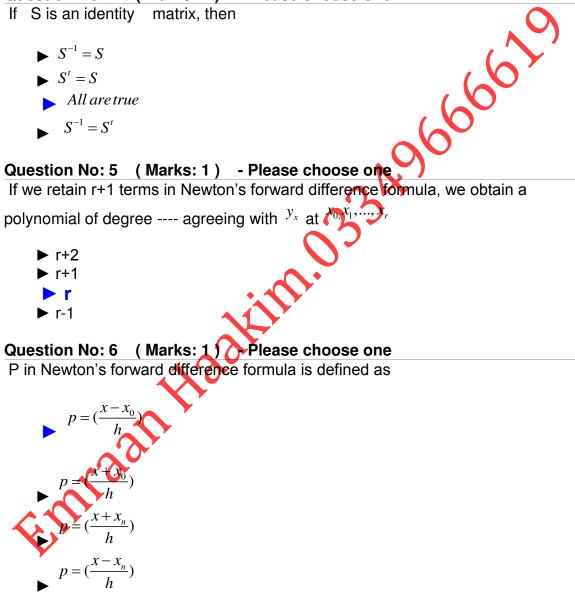


The relationship between central difference operator and the shift operator is given by

$$\delta = E - E^{-1}$$
$$\delta = E + E^{-1}$$
$$\delta = E^{\frac{1}{2}} + E^{-\frac{1}{2}}$$
$$\delta = E^{\frac{1}{2}} - E^{-\frac{1}{2}}$$

Question No: 3 (Marks: 1) - Please choose one Muller's method requires -----starting points

# Question No: 4 (Marks: 1) - Please choose one



# Question No: 7 (Marks: 1) - Please choose one

Octal number system has the base ------



▶ 10 ▶ 16

# Question No: 8 (Marks: 1) - Please choose one

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

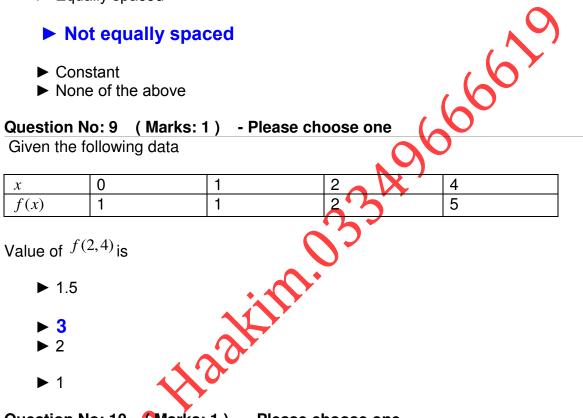
► Equally spaced

# Not equally spaced

- ► Constant
- ► None of the above



Given the following data





If y(x) is approximated by a polynomial  $p_n(x)$  of degree n then the error is given by = v(r) + P(r)

$$\varepsilon(x) = y(x) - P_n(x)$$

$$\varepsilon(x) = P_n(x) - y(x)$$

$$\varepsilon(x) = y(x) \times P_n(x)$$

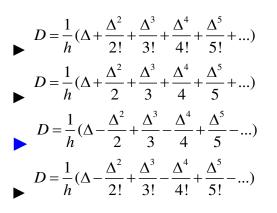
# Question No: 11 (Marks: 1) - Please choose one

Let I denotes the closed interval spanned by  $x_0, x_1, x_2, x_3, x_4, x_5, x_6, x_7, \overline{x}$ . Then F(x) vanishes -----times in the interval I.

▶ n-1 ▶ n+2 ► n ▶ n+1

# Question No: 12 (Marks: 1) - Please choose one

Differential operator in terms of forward difference operator is given by A96667



# Question No: 13 (Marks: 1) - Please choose one

Finding the first derivative of f(x) at x = 0.4 from the following table:

x	0.1	0.2	0.3	0.4
f(x)	1.10517	1.22140	1.34986	1.49182

Differential operator in terms of \_\_\_\_\_\_will be used.

► Forward difference operator Backward difference operator

- Central difference operator
- None of the given choices

# Question No: 14 (Marks: 1) - Please choose one

For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
f(x)	0.425	0.475	0.400	0.452	0.525	0.575

f'(0.1), using two-point equation will be calculated as.....

-0.5
0.5
0.75
-0.75

# Question No: 15 (Marks: 1) - Please choose one

In Simpson's 1/3 rule, f(x) is of the form 96666  $\rightarrow ax+b$  $ax^2 + bx + c$  $ax^3 + bx^2 + cx + d$  $ax^4 + bx^3 + cx^2 + dx + e$ Question No: 16 (Marks: 1) - Please choose one  $I = \int f(x) dx$ h, width of the interval, is found by the formula--While integrating ---. b-aп b+aп a-bп ► None of the given choices Question No: 17 (Marks: 1) - Please choose one To apply Simpson's 1/3 rule, valid number of intervals are..... ▶ 5 ▶ 3

# Question No: 18 (Marks: 1) - Please choose one

For the given table of values

x	02	0.3	0.4	0.5	0.6	0.7
f(x)	0.425	0.475	0.400	0.452	0.525	0.575

 $f^{\prime\prime}(0.2)$ , using three-point equation will be calculated as .....

▶ 17.5 ▶ 12.5 ▶ 7.5 ► -12.5

# Question No: 19 (Marks: 1) - Please choose one

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

- ▶ 2 ▶ 3 ▶ 5
- ▶ 7

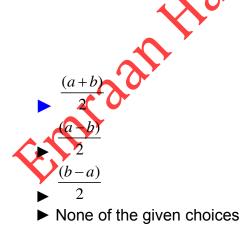
# Question No: 20 (Marks: 1) - Please choose one

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

- ▶ 10
- ▶ 11
- ▶ 12
- ▶ 13

# Question No: 21 (Marks: 1) Please choose one

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 .....



# Question No: 22 (Marks: 1) - Please choose one

.....lies in the category of iterative method.

Bisection Method

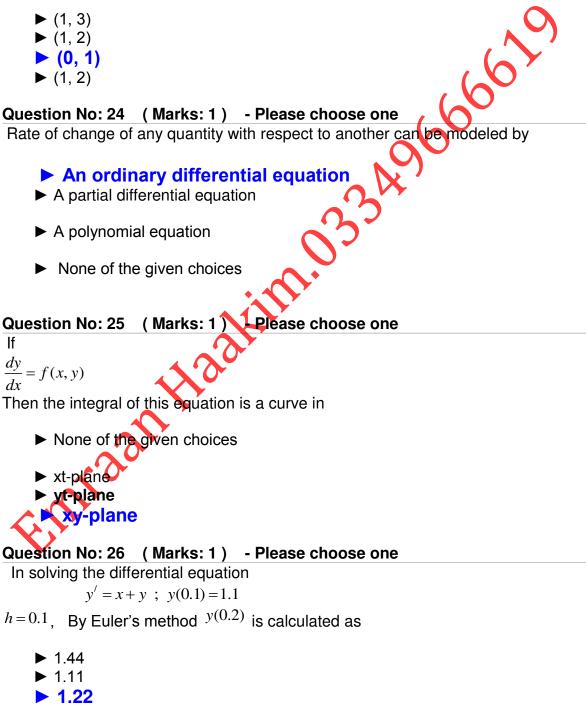


Secant Method

► All the given choices

# Question No: 23 (Marks: 1) - Please choose one

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



▶ 1.33

# Question No: 27 (Marks: 1) - Please choose one

In second order Runge-Kutta method

 $k_1$  is given by

 $k_1 = hf(x_n, y_n)$ 

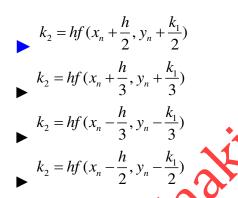
$$k_1 = 2hf(x_n, y_n)$$

$$k_1 = 3hf(x_n, y_n)$$

None of the given choices

# 66661 Question No: 28 (Marks: 1) - Please choose one

3349 In fourth order Runge-Kutta method,  $k_2$  is given by



Question No: 29 (Marks: Y) - Please choose one

In fourth order Runge-Kutta method,  $k_4$  is given by

$$k_{3} = hf(x_{n} + 2h, y_{n} + 2k_{3})$$

$$k_{3} = hf(x_{n} - h, y_{n} - k_{3})$$

$$k_{3} = hf(x_{n} + h, y_{n} + k_{3})$$
None of the given choices

# Question No: 30 (Marks: 1) - Please choose one Adam-Moulton P-C method is derived by employing

# Newton's backward difference interpolation formula

- Newton's forward difference interpolation formula
- Newton's divided difference interpolation formula

► None of the given choices

Mth603 Solved MCQS for Final Term Exam

Solved by Mermaid with reference of book

Exact solution of 2/3 is not exists. TRUE FALSE

The Jacobi's method is
A method of solving a matrix equation on a matrix that has zeros along its
main diagonal.
No
At least one
A 3 x 3 identity matrix have three andeigen values.
Same CO
Different
Eigenvalues of a symmetric matrix are al .
Real
Complex
Zero
Positive
The Jacobi iteration converges, if A is strictly diagonally dominant.
TRUE
FALSE
Below are all the finite difference methods EXCEPT
Jacobi's method
Newton's backward difference method Stirling formula
Forward difference method
If n x n matrices A and B are similar, then they have the same eigenvalues (with the

If n x n matrices A and B are similar, then they have the same eigenvalues (with the same multiplicities). TRUE FALSE If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix, the eigenvalues of A are the diagonal entries of A.

TRUE FALSE

The characteristics polynomial of a 3x 3 Identity matrix is \_\_\_\_\_, if x is the Eigen values of the given 3 x 3 identity matrix. Where symbol ^ shows power.

66

(X-1)^3 (x+1)^3 X^3-1 X^3+1

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

TRUE FALSE

**Bisection method is a** 

Bracketing method Open method

# **Regula Falsi means**

Method of Correct position Method of unknown position Method of false position Method of known position

Eigenvalues of a symmetric matrix are all . Select correct option:

> Real Zero Positive Negative

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

TRUE FALSE

Exact solution of 2/3 is not exists. Select correct option:

TRUE FALSE The Gauss-Seidel method is applicable to strictly diagonally dominant or symmetric definite matrices A. 0,66 Select correct option: Positive Negative solution of the system. Differences methods find the Select correct option: **Numerical** Analytical 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. Select correct option: TRUE

The Jacobi's method is a method of solving a matrix equation on a matrix that has no zeros along its \_\_\_\_\_. Select correct option:

Main diagonal Last column Last row First row If A is a nxn triangular matrix (upper triangular, lower triangular) or diagonal matrix, the eigenvalues of A are the diagonal entries of A. Select correct option:

334,0666 TRUE FALSE A 3 x 3 identity matrix have three and different Eigen values. Select correct option: TRUE FALSE Newton Raphson method falls in the category of Bracketing method Open Method **Iterative Method** Indirect Method Newton Raphson method is also known as Tangent Method Root method **Open Method Iterative Method** Secant Method uses values for approximation 1 3 2 Secant Method is than bisection method for finding root Slow Faster

In Newton Raphson method

Root is bracketed Root is not bracketed

# Regula falsi method and bisection method are both

Convergent Divergent

# In bisection method the two points between which the root lies are

Similar to each other In which methods we do not need initial approximation to start Indirect Method Open Method Direct Method Iterative Method Root may be Different

Complex or real None

In Regula falsi method we choose points that have signs

# 2 points opposite signs

3 points opposite signs 2 points similar signs None of the given

# In a bounded function values lie between

1 and -1 1 and 2 0 and 1 0 and -

# Newton Raphson method is a method which when it leads to division of number close to zero

Diverges

Converges

# Which of the following method is modified form of Newton Raphson Method? Regula falsi method

**Bisection method** Secant method Jacobi's Method

# Which 1 of the following is generalization of Secant method?

Muller's Method Jacobi's Method **Bisection Method** N-R Method

# Secant Method needs starting points

66667 Near a simple root Muller's Method converges than the secant method

# Faster

Slower

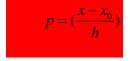
# If S is an identity matrix, then

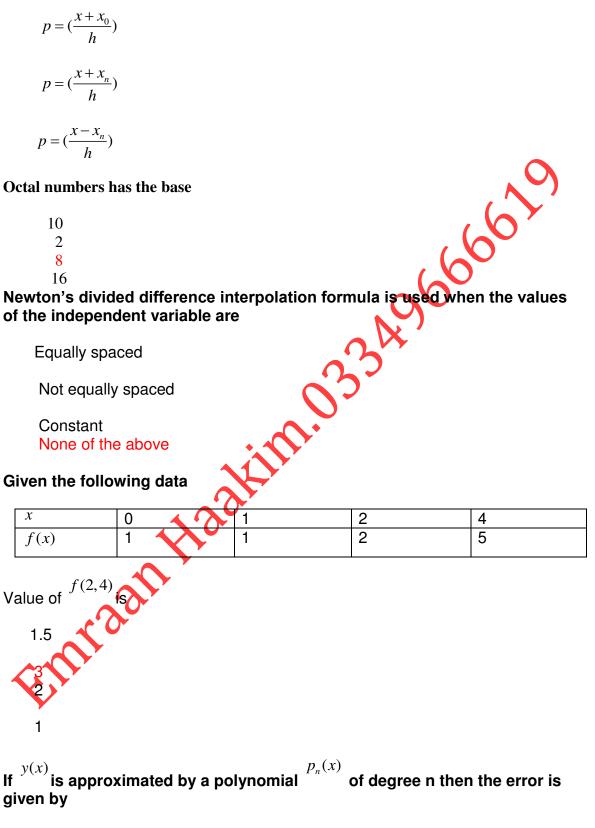
```
S^{-1} = S
S^t = S
 S^{-1} = S^t
 All are true
```

If we retain r+1 terms in Newton's forward difference formula, we obtain a

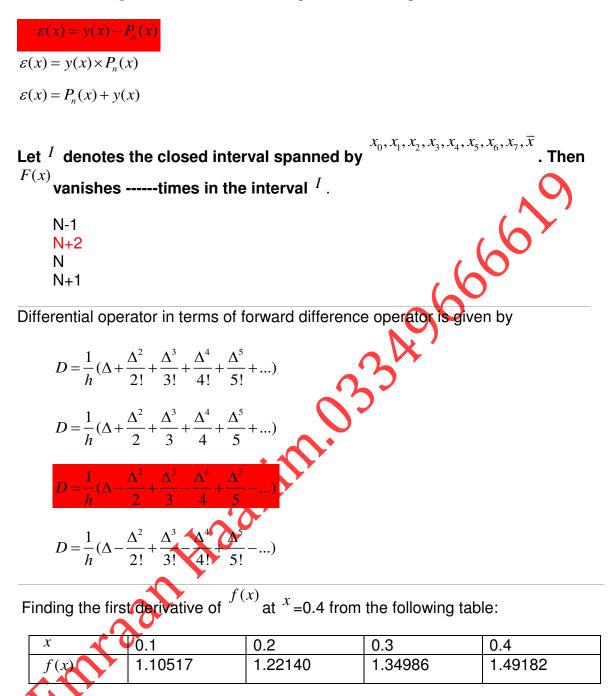
 $x_{0,}x_{1},...,x_{r}$ polynomial of degree ---- agreeing with  $y_x$  at

P in Newton's forward difference formula is defined as





 $\mathcal{E}(x) = y(x) + P_n(x)$ 



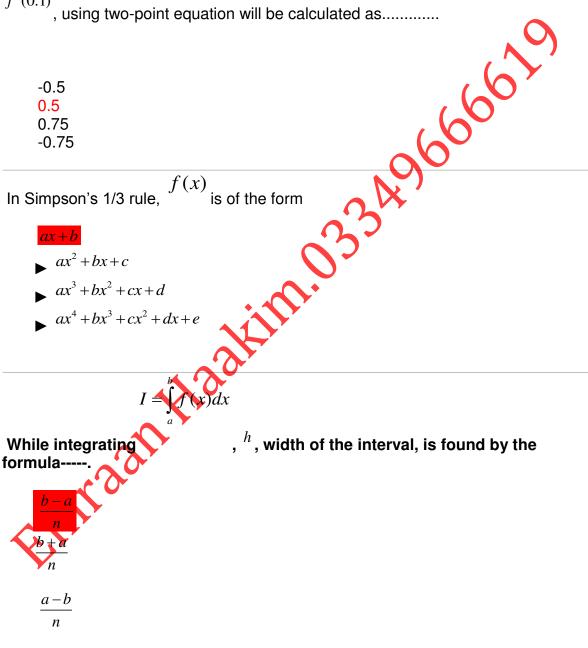
Differential operator in terms of -----will be used.

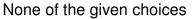
Forward difference operator Backward difference operator Central difference operator All of the given choices

# For the given table of values

x	0.1	0.2	0.3	0.4	0.5	0.6
f(x)	0.425	0.475	0.400	0.452	0.525	0.575

 $f^{\prime}(0.1)$  , using two-point equation will be calculated as.....





To apply Simpson's 1/3 rule, valid number of intervals are.....

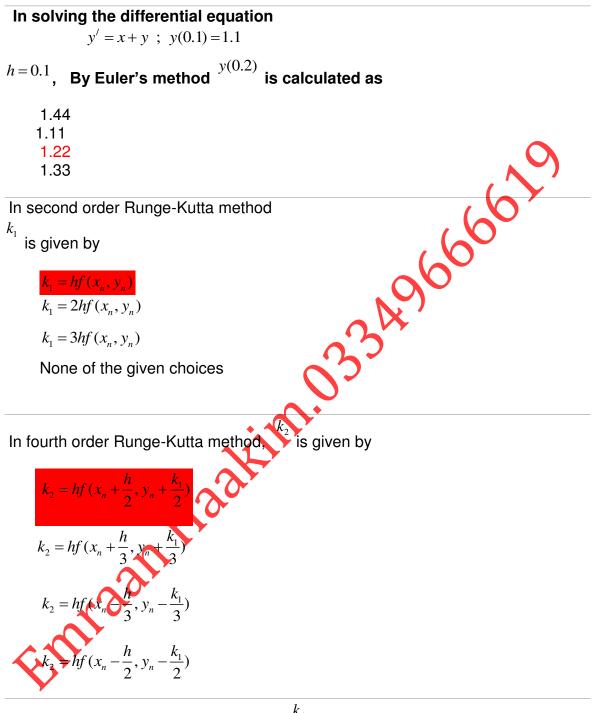
# For the given table of values

FOI	the g	iven table o	i values				
x		0.1	0.2	0.3	0.4	0.5	0.6
f(	( <i>x</i> )	0.425	0.475	0.400	0.452	0.525	0.575
<i>f</i> ''(0	<sup>0.2)</sup> , u	sing three-	point equa	tion will be	calculated	l as	0
1	7.5					$\langle \mathcal{O} \rangle$	
1	2.5				(		
7	7.5				N.	~)	
-1	2.5				- China Mark	•	
То а	pply	Simpson's	1/3 rule, th	e number o	fintervals	in the follo	wing must
be		-		C			_
	2			`			
	<mark>2</mark> 3 5 7						
	5		<b>A</b>				
	7			<b>V</b>			
	pply	Simpson's	3/8 rule, th	e number o	of intervals	in the follo	wing must
be			XY -				
1	10 11 12	, ddl					
		t of the give		a lice botw	on a and b	then the f	irot

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 .....



 $\frac{(a-b)}{2}$  $\frac{(b-a)}{2}$ None of the given choices .....lies in the category of iterative method. **Bisection Method** Regula Falsi Method Secant Method All of the given choices For the equation  $x^{3}+3x-1=0$ , the root of the equation lies in the interval..... 34 (1, 3)(1, 2)(0, 1)(1, 2)Rate of change of any quantity with respect to another can be modeled by An ordinary differential equa A partial differential equation A polynomial equation None of the given choices lf Then the integral of this equation is a curve in None of the given choices Xt-plane Yt-plane Xy-plane



In fourth order Runge-Kutta method,  $k_4^{k_4}$  is given by

$$k_{3} = hf(x_{n} + 2h, y_{n} + 2k_{3})$$
$$k_{3} = hf(x_{n} - h, y_{n} - k_{3})$$



None of the given choices

# Adam-Moulton P-C method is derived by employing

Newton's backward difference interpolation formula Newton's forward difference interpolation formula Newton's divided difference interpolation formula None of the given choices

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

# **Derivatives**

Antiderivative

# If $|A| \neq 0$ then system will have a

Definite solution Unique solution Correct solution No solution

# If |A| = 0 then

There is a unique solution There exists a complete soluti There exists no solution None of the above options

# Direct method consists of method

2 3 5

We consider Jacobi's method Gauss Seidel Method and relaxation method as Direct method Iterative method Open method All of the above

# In Gauss Elimination method Solution of equation is obtained in

3 stages 2 stages

4 stages 5 stages

# Gauss Elimination method fails if any one of the pivot values becomes

Greater Small Zero None of the given

# Changing the order of the equation is known as

Pivoting

Interpretation

Full pivoting is than partial pivoting Easy More complicated

# 966667 The following is the variation of Gauss Elimination method

Jacobi's method Gauss Jordan Elimination method

# Courts reduction method is also known as Cholesky Reduction method True False

Jacobi's method is also known as method of Simultaneous displacement

True

# False Gauss Seidel method is also known as method of Successive displacement False

True

In Jacobi's method approximation calculated is used for

Nothing Calculating the next approximation Replaced by previous one All above

# In Gauss Seidel method approximation calculated is replaced by previous one True

False

Relaxation method is derived by South well Not defined

**Power method is applicable for only** Real metrics Symmetric Unsymmetrical Both symmetric and real

The process of eliminating value of y for intermediate value of x is know as interpolation hhó True False Question No: 31 (Marks: 2) If F(h) = 256.2354 and  $F(\frac{h}{2}) = 257.1379$  $F_1$ using Richardson's , then find extrapolation limit. Question No: 32 (Marks: 2) Evaluate the integral  $(\cos x + 2)d$ Using Simpson's 3/8 rule π Take h= 4 Question No: 33 (Marks: 2) Write a general formula for Modified Euler's method of solving the given differential equation. Question No: 34 (Marks: 3) Evaluate the integral  $x^2 dx$ Using Trapezoidal rule Take h=1

# Question No: 35 (Marks: 3)

