HASEEB

VU

Virtual University

M.SC

(MATH)

CBIT

Narowal Campus

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Question # 2 of 10 (Start time: 10:55:53 AM, 21 June 2022)

Differences methods find the _____ solution of the system.

Select the correct option

○	numerical
○	Analytical

A

Question # 4 of 10 (Start time: 10:59:28 AM, 21 June 2022)

A and its transpose matrix have _____ eigenvalues.

Select the correct option

- different
- same

B

Question # 5 of 10 (Start time: 11:00:01 AM, 21 June 2022)

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

Select the correct option

- negative
- positive

B

Question # 6 of 10 (Start time: 11:00:31 AM, 21 June 2022)

Eigenvalues of a _____ matrix are all real.

Select the correct option

- triangular
- rectangular
- symmetric

C

- antisymmetric

Question # 7 of 10 (Start time: 11:01:04 AM, 21 June 2022)

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

Select the correct option

○	diverges
○	converges

B

Question # 9 of 10 (Start time: 11:02:46 AM, 21 June 2022)

Power method is applicable if the eigen values are _____.

Select the correct option

○	real and equal
○	real and distinct
○	negative and distinct
○	positive and distinct

B

Question # 10 of 10 (Start time: 11:03:16 AM, 21 June 2022)

Let [A] be a 3x3 real symmetric matrix with

$$|a_{12}|$$

be numerically the largest off-diagonal element of A, then we can construct orthogonal matrix S1 by Jacobi's method as

Select the correct option

○	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\cos\theta \\ 0 & \sin\theta & -\sin\theta \end{bmatrix}$
○	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$
○	$\begin{bmatrix} \cos\theta & 0 & -\sin\theta \\ 0 & 1 & 0 \\ \sin\theta & 0 & \cos\theta \end{bmatrix}$
○ D	$\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$

MTH603:Quiz No.2

Question # 3 of 10 (Start time: 11:36:54 AM, 21 June 2022)

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

Select the correct option

O	unity
O	zero

B

MTH603:Quiz No.2

Question # 4 of 10 (Start time: 11:38:02 AM, 21 June 2022)

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

Select the correct option

- slow

A

- fast

MTH603:Quiz No.2

Question # 6 of 10 (Start time: 11:40:44 AM, 21 June 2022)

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

Select the correct option

- TRUE

A

- FALSE

MTH603:Quiz No.2

Question # 10 of 10 (Start time: 11:44:25 AM, 21 June 2022)

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

Select the correct option

○	TRUE
	A
○	FALSE

Question # 7 of 10 (Start time: 11:41:26 AM, 21 June 2022)

While using Jacobi method for the matrix

$$A = \begin{bmatrix} 1 & \sqrt{3} & 2 \\ \sqrt{3} & 3 & \sqrt{2} \\ 2 & \sqrt{2} & 1 \end{bmatrix}$$

the value of 'theta θ' can be found as

Select the correct option

○	$\tan 2\theta = \frac{2a_{13}}{a_{33} - a_{11}}$
○	$\tan 2\theta = \frac{2a_{12}}{a_{11} - a_{22}}$
○	C $\tan 2\theta = \frac{2a_{13}}{a_{11} - a_{33}}$
○	$\tan 2\theta = \frac{2a_{23}}{a_{22} - a_{33}}$

Question # 1 of 10 (Start time: 12:07:03 PM, 21 June 2022) Total Marks:

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

Select the correct option

- diagonal
- upper triangular
- scalar
- lower triangular

A

Question # 2 of 10 (Start time: 12:08:28 PM, 21 June 2022)

Total Marks: 1

A 3 x 3 identity matrix have three and _____eigen values.

Select the correct option

- same
- different

B

Question # 5 of 10 (Start time: 12:10:48 PM, 21 June 2022)

Total Marks: 1

Direct methods can be more rapid than iterative algorithms.

Select the correct option

- FALSE
- TRUE

A

t time: 12:11:53 PM, 21 June 2022)

Which of the following is a forward difference table for the given values of x and y?

x	0.3	0.7	1.1
y	0.067	0.248	0.518

Rel

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.315	0.1071
0.7	0.248	0.766	
1.1	0.518		

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.181	0.089
0.7	0.248	0.27	
1.1	0.518		

B

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.27	0.089
0.7	0.248	0.181	
1.1	0.518		

x	y	Δy	$\Delta^2 y$
0.3	0.067	0.089	0.27
0.7	0.248	0.181	
1.1	0.518		

Click to Save Answer & Move to N

For differences methods we require the initial approximation.

Select the correct option

- TRUE
- FALSE

B

Click to Save Answer & Move to Next Question

Question # 8 of 10 (Start time: 12:13:53 PM, 21 June 2022)

While using power method, from the resultant normalize vector

$$u^{(2)} = 11.4817 \begin{pmatrix} 0.398176 \\ 0.821267 \\ 1.0 \end{pmatrix}$$

we have the largest eigen value and the corresponding eigenvector as

Select the correct option

○	$\lambda = 0.821267,\ (X) = \begin{pmatrix} 0.398176 \\ 11.4817 \\ 1.0 \end{pmatrix}$
○	$\lambda = 11.4817,\ (X) = \begin{pmatrix} 0.398176 \\ 1.0 \\ 0.821267 \end{pmatrix}$
○	$\lambda = 0.398176,\ (X) = \begin{pmatrix} 11.4817 \\ 0.821267 \\ 1.0 \end{pmatrix}$
○	D $\lambda = 11.4817,\ (X) = \begin{pmatrix} 0.398176 \\ 0.821267 \\ 1.0 \end{pmatrix}$

Question # 5 of 10 (Start time: 11:39:17 AM, 21 June 2022)

While using power method, the computed vector

$$u^{(1)} = \begin{pmatrix} 7 \\ 12 \\ 14 \end{pmatrix}$$

will be in normalized form as

Select the correct option

- $u^{(1)} = \frac{1}{7}\begin{pmatrix} 1 \\ 7/12 \\ 7/14 \end{pmatrix}$
- C $u^{(1)} = 14\begin{pmatrix} 7/14 \\ 12/14 \\ 1 \end{pmatrix}$
- $u^{(1)} = 12\begin{pmatrix} 7/12 \\ 1 \\ 14/12 \end{pmatrix}$

MTH603:Quiz No.2

Question # 4 of 10 (Start time: 12:34:49 PM, 21 June 2022)

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

Select the correct option

- ○ FALSE
- ● TRUE

Question # 5 of 10 (Start time: 12:35:17 PM, 21 June 2022)

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.

Select the correct option

○	Less than
○	Different
○	Greater than
●	Same

MTH603:Quiz No.2

Question # 7 of 10 (Start time: 12:36:40 PM, 21 June 2022)

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

Select the correct option

○	FALSE
●	TRUE

MTH603:Quiz No.2

Question # 9 of 10 (Start time: 12:37:48 PM, 21 June 2022)

Let $[A]$ be a 3×3 real symmetric matrix with $|a_{13}|$ be the numerically largest off − diagonal element then using Jacobi's method the value of θ can be found by

Select the correct option

- $\tan 2\theta = \frac{2a_{13}}{a_{11} - a_{33}}$
- $\tan 2\theta = \frac{2a_{12}}{a_{11} - a_{22}}$
- $\tan 2\theta = \frac{2a_{23}}{a_{22} - a_{33}}$
- $\tan 2\theta = \frac{2a_{23}}{a_{33} - a_{22}}$

MTH603:Quiz No.2

Question # 10 of 10 (Start time: 12:38:16 PM, 21 June 2022)

Differences methods are iterative methods.

Select the correct option

- (●) FALSE
- ( ) TRUE

MTH603:Quiz No.2

Question # 6 of 10 (Start time: 12:36:04 PM, 21 June 2022)

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

Select the correct option

○	TRUE
○	FALSE

B

TH603:Quiz No.2

uestion # 8 of 10 (Start time: 12:37:14 PM, 21 June 2022)

Which of the following is a forward difference table for the given values of x and y?

x	0.1	0.5	0.9
y	0.003	0.148	0.37

elect the correct option

x	y	Δy	$\Delta^2 y$
0.1	0.003	0.287	0.644
0.5	0.148	0.357	
0.9	0.37		

x	y	Δy	$\Delta^2 y$
0.1	0.003	0.567	0.704
0.5	0.148	0.137	
0.9	0.37		

C

x	y	Δy	$\Delta^2 y$
0.1	0.003	0.145	0.077
0.5	0.148	0.222	

Let [A] be a 3x3 real symmetric matrix with

$$|a_{23}|$$

be numerically the largest off-diagonal element of A, then we can construct orthogonal matrix S1 by Jacobi's method as

Select the correct option

○	$\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$
○	$\begin{bmatrix} \cos\theta & 0 & -\sin\theta \\ 0 & 1 & 0 \\ \sin\theta & 0 & \cos\theta \end{bmatrix}$
○	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\cos\theta \\ 0 & \sin\theta & -\sin\theta \end{bmatrix}$
●	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$

Let [A] be a 3x3 real symmetric matrix with

$$|a_{13}|$$

be numerically the largest off-diagonal element of A, then we can construct orthogonal matrix S1 by Jacobi's method as

Select the correct option

○	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\cos\theta \\ 0 & \sin\theta & -\sin\theta \end{bmatrix}$
●	$\begin{bmatrix} \cos\theta & 0 & -\sin\theta \\ 0 & 1 & 0 \\ \sin\theta & 0 & \cos\theta \end{bmatrix}$
○	$\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\sin\theta \\ 0 & \sin\theta & \cos\theta \end{bmatrix}$
○	$\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Question # 1 of 10 (Start time: 10:54:22 AM, 21 June 2022)

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

Select the correct option

○	Av = Ax
○	Av + xv=0
○	Ax = xv
○	Av = xv

D

Question # 8 of 10 (Start time: 11:01:38 AM, 21 June 2022)

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

Select the correct option

- ○ Finite Multiple
- ○ Unique
- ○ None
- ○ Infinite many

D

Question # 10 of 10 (Start time: 12:15:26 PM, 21 June 2022)

While using Jacobi method for the matrix

$$A = \begin{bmatrix} 1 & 2 & \sqrt{2} \\ 2 & 3 & \sqrt{2} \\ \sqrt{2} & \sqrt{2} & 1 \end{bmatrix}$$

and theta θ =-0.5535, the orthogonal matrix S1 will be given by

Select the correct option

A i think
now confirm A

$$S_1 = \begin{bmatrix} \cos 0.5535 & \sin 0.5535 & 0 \\ -\sin 0.5535 & \cos 0.5535 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$S_1 = \begin{bmatrix} \cos 0.5535 & 0 & 0 \\ 0 & -\sin 0.5535 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$$S_1 = \begin{bmatrix} \cos 0.5535 & 0 & \sin 0.5535 \\ 0 & 1 & 0 \\ -\sin 0.5535 & 0 & \cos 0.5535 \end{bmatrix}$$

$$S_1 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos 0.5535 & -\sin 0.5535 \\ 0 & \sin 0.5535 & \cos 0.5535 \end{bmatrix}$$