



MTH603 Numerical Analysis

Grand Quiz Fall 2020

Department of MCS

Compose By

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Semester 3rd

OBJECTIVE

- Two matrices with the same characteristics polynomial need not be similar.
 - True
 - False
- If $A = \begin{bmatrix} 3 & 2 & 3 \end{bmatrix}$ then by using (Gaussian Elimination Method) the value of A^{-1} will be:
 - none
 - $\begin{bmatrix} 1/2 & 0 & 0 & -2 & -3/2 & -1/2 \end{bmatrix}$
 - None
- The characteristics polynomial of 3×3 identity matrix is _____. If x is the eigen values of the given 3×3 identity matrix. Where symbol $\wedge$ shiw power.
 - $(x-1)^3$
 - $(x+1)^3$
 - $(X+3)^1$
 - None

4. 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
 - b. 4
 - c. 3
 - d. 2
5. Relaxation Method is a/an_____
- a. Direct method
 - b. Iterative method
6. Direct method can be more rapid than iterative algorithms.
- a. True
 - b. False
7. Let $[A]$ be a 3×3 real symmetric matrix with $|a_{23}|$ be numerically the largest off-diagonal element of A , then we can construct orthogonal matrix S_1 by Jacobi method
- a. $\begin{bmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{bmatrix}$
 - b. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos \theta & -\sin \theta \\ 0 & \sin \theta & \cos \theta \end{bmatrix}$ \\ not conform
8. 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. (1,4)
 - d. (-2,3)
9. While using 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. No need to reorder
 - d. $x+4y=4$
10. $3x^4 - 2x^2 - 24 = 0$ has at least ___ real root(s)?
- a. 1
 - b. 2
 - c. 3
 - d. 4
11. An eigenvector V is said to be normalized if the coordinate of the largest magnitude is equal to one.
- a. True

- b. False
12. If $n \times n$ matrices A and B are similar, then they have the ____ eigenvalues (with the same multiplicities).
- a. Same
b. Different
13. In Jacobi's Method, the rate of convergence is quite slow compared with other methods.
- a. True
b. False
14. While using Relaxation method, which of the following is the largest Residual for 1st iteration on the system: $2x+3y=1$, $3x+3y=-4$?
- a. -4
b. 3
c. -3
d. 4
15. 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
d. Different
16. If the determinant of a matrix A is equal to zero then the system of equations will have ____
- a. Unique solution
b. One solution
c. Infinitely many solution
d. One solution or Infinitely many solution
17. In the context of Jacobi's method for finding Eigen values and Eigen vectors of a real symmetric matrix of order 2×2 , if $|-5|$ be its largest off-diagonal then which of the following will be its corresponding off-diagonal values of Orthogonal Matrix?
- a. $\cos(\theta)$, $-\cos(\theta)$
b. $\sin(\theta)$, $\cos(\theta)$
c. $\sin(\theta)$, $-\sin(\theta)$
d. $-\sin(\theta)$, $\cos(\theta)$
18. The Gaussian elimination method fails if any of the pivot elements becomes ____

- a. One
 - b. Two
 - c. Three
 - d. Zero
19. Let $|A|$ be a 3×3 real symmetric matrix with $|a_{13}|$ be the numerically large setoff-diagonal element then using Jacobi's method the value of Theta can be found by
- a. $\tan 2(\theta) = 2a_{13} / (a_{11} - a_{33})$
 - b. None
20. Under elimination methods, we consider Gaussian elimination and _____ methods?
- a. Gauss-Seidel
 - b. Jacobi's
 - c. Gauss-Jordan elimination
21. In the context of Jacobi's method for finding Eigen values and Eigen vectors of a real symmetric matrix of order 2×2 , if $|-5|$ be its largest off-diagonal then which of the following will be its corresponding off-diagonal values of Orthogonal Matrix?
- a. $\pi/3$
 - b. $\pi/6$
 - c. $\pi/4$
 - d. $\pi/2$
22. While using Jacobi's method for the matrix: $A = \begin{bmatrix} 2 & 0 & 0 & 0 & 2 & 1 \end{bmatrix}$
- a. $\tan 2(\theta) = 2a_{23} / (a_{22} - a_{33})$
 - b. $S_1 = [\cos x/4 \ 0 \ -\sin x/4 \ 0 \ 1 \ 0]$ in second q#
23. In _____ method, the elements above and below the diagonal are simultaneously made by zero.
- a. Jacobi's
 - b. Gauss-Seidel
 - c. Gauss-Jordan Elimination
 - d. Fried
24. Eigenvalues of a symmetric matrix are all _____
- a. Real
 - b. Complex
 - c. Zero
 - d. Positive

25. In full pivoting we interchange rows and columns such that the ___ elements in the matrix of the variable also get changed.
- Smallest
 - Middle
 - Largest
 - None of the given
26. Which of the following systems of linear equations has a strictly diagonally dominant coefficient matrix?
- $7x_1 + 5x_2 - 1x_3 = 9$
 - $-x_1 + 3x_2 + x_3 = 1$
 - $x_1 + 2x_2 + 2x_3 = 1$
27. While using Jacobi's method for the matrix $A = \begin{bmatrix} 1/4 & 1/4 & 1/3 \\ 2^{nd} \text{ line } 1/4 & 1/3 & 1/4 \end{bmatrix}$
- $S_1 = [1 \ 0 \ 0 \ 0 \ \cos 0.7192 \ -\sin 0.7291]$
28. The basic of idea of relaxation method is to reduce the largest residual to ___
- One
 - Zero
 - Two
 - Four
29. The linear equation: $0x + 0y = 2$ has _____ solution/ solutions.
- Unique
 - No solution
 - Infinite many
 - None of the given
30. While solving by Gauss-Seidel method, which of the following is the first iteration solution for the system: $x - 2y = 2$, $x + 4y = 4$?
- (1, 0, 75)
 - (0, 0)
 - (1, 0)
 - (0, 1)
31. Gauss-Jordan Method is similar to _____
- Gauss-Seidel method
 - Iteration method
 - Gaussian elimination method
 - Relaxation method
32. Power method is applicable if the Eigen values are real and distinct.

- a. True
b. False
33. If the product of two matrices is an identity matrix that is $AB=I$, then which of the following is true?
a. A is transpose of B
b. A is inverse of B
c. A is singular
d. B is singular
34. While using power method the computed vector $u(2) = 5.57428$
9.57142 12.21423
a. $U(2)=5.571428$
35. In Jacobi's method, the rate of convergence is quite ____ compared with other methods.
a. Slow
b. Fast
36. While using power method, the computed vector $u(2) = 1.8 -0.8 0.6$
a. $U(2)=0.6(1.8/0.6)$
37. $|A| \quad ||$
a. $R1=3/4 \quad R2$
38. Which of the following system of equation is diagonally dominant
a. $\begin{bmatrix} 1 \\ 1 \end{bmatrix} \begin{matrix} x+y-z=4 \\ x+y+9z=3 \end{matrix} \begin{bmatrix} x+8y+5z=3 \end{bmatrix}$
39. Which of the following system of equation is diagonally dominant
a. $X+y+9z=3$
40. The root of the equation $xe^x - 5 = 0$ is bounded in the interval.
a. $[-2, 1]$
b. $[-1, 1]$
c. $[0, 1]$
d. $[1, 2]$
41. Central difference method seems to be giving a better approximation. However it requires more computations.
a. True
b. False
42. 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
b. False

43. Jacobi's method is highly recommended for ___ matrix compute all the Eigen values and the corresponding Eigenvectors.
- a. Real symmetric
 - b. Non real
 - c. Real un-symmetric
 - d. None of the given
44. Non-convergence in Newton-Raphson method can occur if the initial value is selected such that the derivative of the function equals to
- a. Infinity
 - b. Zero
 - c. One
 - d. Negative infinity
45. The 3rd row of the augmented matrix of the system of linear equation is: $2x+z=4$
- a. 1, -1, 0 and -5
 - b. 0, -1, 1 and -5
 - c. 1, -1, 0 and 5
 - d. 0, -1, 3 and -5
46. While using Jacobi's method for the matrix $A = \begin{bmatrix} 1 & 1/4 & 1/4 \\ 1/4 & 1 & 1/2 \\ 1/4 & 1/2 & 1 \end{bmatrix}$
- a. $\tan^2(\theta) = 2a_{13}/a_{33} - a_{11}$
47. While using power method the computed vector $u(1) = \begin{bmatrix} 7 \\ 12 \\ 14 \end{bmatrix}$
- a. $U(1) = 7 \begin{bmatrix} 1 \\ 12/7 \\ 14/7 \end{bmatrix}$
48. An augmented matrix may also be used to find the inverse of a matrix by combining it with the ____ matrix.
- a. Inverse
 - b. Square
 - c. Identity
 - d. None of the given
49. The dominant or principal Eigenvector of a matrix is an eigenvector corresponding to the eigenvalue of largest magnitude (for real numbers, largest absolute value) of that matrix.
- a. True
 - b. False
50. _____ Power method is applicable, if the Eigen vector corresponding to eigen values are linearly _____
- a. Independent
 - b. Dependent

51. The first root of a quadratic is -3 under root -11 , then other root will be
a. Square root 3 + square root 11i
52. Which of the following rearrangement make strictly diagonal dominant the system of linear equation; $x-3y+z=-2$ $-6x+4y+11z=1$ $5x-2y-2z=9$?
a. $5x-2y-2z=9$ $x-3y+z=-2$ $-6x+4y+11z=1$
53. 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 non-singular
c. AB=identity matrix
d. All choices are true
54. Two matrices with the _____ characteristics polynomial need not be similar.
a. Same
b. Different
55. For a system of linear equations the corresponding coefficient matrix has the value of determinant, $|A| = -3$, 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 many solution
d. The system has no solution
56. The linear equation: $x+y=1$ has _____ solution/solutions.
a. No solution
b. Unique
c. Infinite many
d. Finite many

----- THE END -----

Solved by: riz Mughal and washi khan

Note:

If you found any mistake then correct own
yourself.