

**A10**

**Sreenidhi Institute of Science & Technology**

(An Autonomous Institution)

**Code No: 101MA08/111MA08**

**B. TECH. II – Year I – Semester Examinations, MAY/JUNE, 2014 (Supplementary)**

**MATHEMATICAL METHODS FOR BIOTECHNOLOGY (BT)**

**Time: 3 Hours Max. Marks: 70**

**Note: No additional answer sheets will be provided.**

**Part - A (Objective Type)**

**Max.Marks:20**

**Answer all QUESTIONS.**

1. Use elementary transformation to reduce the matrix to triangular form and hence find rank .
2. Determine the eigenvectors of the matrix
3. Show that 
4. Construct a forward difference table for the following values of x and y and find value.

x: 10 20 30 40 50

y=f(x): 46 66 81 93 101

1. Explain the Bisection method.
2. Write the False position method.
3. Write the Trapezoidal rule.
4. Write the normal equations to fit the curve 
5. Write the Runge-Kutta fourth order method to solve the differential equation
6. Solve the differential equation with the conditionand h=0.01,find .

**Part – B**

**Max. Marks: 50**

**ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.**

1. a)Solve the equations .By using the Guass elimination method.

b)Solve the system 8 . By using the LU

1. Decomposition method.
   1. Find the characteristic roots of the matrix

b)Verify the Cayley-Hamilton theorem for the matrix A= . Find , if it exists.

1. a) Define diagonalizable matrix.Show that the matrix A= is diagonizable.

b)Evaluate , given the following table of values: 

. By using the Newton,s forward difference interpolation formula.

1. a) Derive Newton’s forward and backward interpolation formulas.

b) Apply Lagrange’s formula to find given that

and explain why the result differs from .

1. a)Find a real root of the equation by the iteration method.

b)Find the real root of the equation ,using Newton-Raphson method.

6. a) Evaluate , by Simpson’s rule, using the data ; ; .

b) Fit an exponential curve of the form to the following data

7. a)Evaluate, by using the trapezoidal rule.

b)Use Taylor’s series for ,find correct to four decimal places if  satisfies

* + - 1. and 

8. a)Use Picard’s method to approximate when given that when

and .

b) Given , where . Use Runge-Kutta method, find and .

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