

**A14**

**Sreenidhi Institute of Science and Technology**

(An Autonomous Institution)

**Code No: 4H315**

**B. TECH. II-Year I-Semester Examinations, December 2015 (Regular)**

**MATHEMATICS FOR BIOTECHNOLOGY - III (BT)**

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

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

**Part - A**

**Max.Marks:20**

**Answer all QUESTIONS. EACH QUESTION CARRIES 2 MARKS.**

1. Transform the matrix A= to normal form.
2. Define Characteristic equation with an example.
3. Write the Newton’s Forward and Backward interpolation formulae.
4. Briefly explain Newton-Raphson method.
5. Write the formulae for Trapezoidal rule and Simpson’s 1/3 rd rule.
6. Write the formulae for Taylor’s series method of successive approximation.
7. Briefly explain the Gauss Jordan method to find the inverse of a matrix
8. Explain central difference.
9. Write the formulae for Picard’s method of successive approximation.
10. Explain the diagonalization of a matrix.

**PAR- B**

**(5X10M=50)**

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

1 a) Solve the equations 4x + y + 2z = – 1 , x + 5y + z = 5 ,

2x + y + 4z = 3 by rank method.

b) Find the inverse of the matrix by Gauss Jordan method.

1. a) Find the inverse of the matrix A = by Cayley Hamilton Theorem.

b) Reduce the matrix  to the diagonal form.

1. a) Evaluate f(6) from the following table using Gauss forward difference formulae.

x: 0 5 10 15 20 25

y: 7 11 14 18 24 32

b) Find f(41) using Newton’s backward interpolation formula from the following data.

x: 20 25 30 35 40 45

y: 354 332 260 131 205 231

1. a) Find a real root of the equation x3 – 5x + 1 = 0 using False position method correct to

three decimal places .

b) Find a real root of the equation 3x3 – 9x2 +8 = 0 using Newton-Raphson method

correct to 3 decimal places.

1. a) Fit a straight line to the following data:

X: 1 2 3 4 6 8

Y: 2.4 3 3.6 4 5 6

b) Evaluate dx using Simpson’s 1/3 rd rule.

1. a) Find the value of y at 0.3 by Taylor’s series method correct to five decimal places from

 = x 2 y – 1, y(0) = 1.

b) Apply Euler’s method to solve = x + y, y(0) = 0 choosing the step length 0.1

( carry out 5 steps).

7 a) Estimate the value of f(24) from the following data using Newton’s forward

Interpolation formula.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | 20 | 25 | 30 | 35 | 40 | 45 |
| f(x) | 355 | 330 | 299 | 261 | 232 | 203 |

b) For what value of k will the following equations fail to have unique solution

3x-y+kz = 1; 2x + y + z = 2; x + 2y – kz = -1

8 a) Evaluate  to four decimal places by the iterative method.

b) Find the approximate values of y and z corresponding to x = 0.1, given that

y(0) =2, z(0)=1 and dy/dx = x+z, dz/dx = x – y2 by Picards method.

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