**Regulations:**

**A14**



**H.T No**

**Sreenidhi Institute of Science and Technology**

(An Autonomous Institution)

**Code No: 4H314 Date: 13-June-2019 (AN)**

**B.Tech II-Year I-Semester External Examination, May-2019 (Supplementary)**

**Mathematics for Biotechnology - III (BT)**

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

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

*b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.*

*c) Missing data can be assumed suitably.*

**Part - A Max.Marks:20**

**Answer all QUESTIONS.**

|  |  |  |
| --- | --- | --- |
| 1. | Define rank of a matrix | [2M] |
| 2. | Reduce the matrix *A* =  to echelon form and hence find its rank. | [2M] |
| 3. | If *A* =  then find the Eigen values of. | [2M] |
| 4. | Derive Newton iterative formula to find . | [2M] |
| 5. | Explain the criteria involved in the selection of an interpolation formula. | [2M] |
| 6. | Write the normal equations to fit a straight line | [2M] |
| 7. | State the difference between Euler’s method and Milne’s method to solve a first order differential equation | [2M] |
| 8. | Find  taking | [2M] |
| 9. | Evaluate  using Trapezoidal rule | [2M] |
| 10. | State the Picard’s formula for solving the differential equation | [2M] |

**Part – B Max.Marks:50**

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

|  |  |  |  |
| --- | --- | --- | --- |
| 11. | a) | Reduce the matrix  into normal form. | [5M] |
|  | b) | Solve the equations x+y+z=6, 3x+3y+4z=20, 2x+y+3z=13 using Gauss elimination method. | [5M] |
|  |  |  |  |
| 12. | a) | Find the Eigen values and the corresponding Eigen vectors of | [5M] |
|  | b) | If , find  using Cayley-Hamilton theorem | [5M] |
|  |  |  |  |
| 13. | a) | If the following data represents the polynomial of degree 4, find the missing values.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |  | 1 | -1 | 1 | -1 | 1 | - | - | - | | [5M] |
|  | b) | Show that . | [5M] |
|  |  |  |  |
| 14. |  | Find the cubic polynomial  which takes on the values  Also find | [10M] |
|  |  |  |  |
| 15. | a) | Find the real root of  by the method of false position. | [5M] |
|  | b) | Find  using Newton’s method. | [5M] |
|  |  |  |  |
| 16. | a) | Given the following values of   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  | 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | |  | 1.3863 | 1.4351 | 1.4816 | 1.5261 | 1.5686 | 1.6094 | 1.6484 | |   Evaluate  by Simpson’s  rule | [5M] |
|  | b) | Fit a curve of the form  to the data given below.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1990 | 2000 | 2010 | 2020 | |  | 0 |  | 1 | 1.5 | | [5M] |
|  |  |  |  |
| 17. |  | Apply Runge Kutta Method to an approximate value of  for  in steps of 0.1  If , given  when. | [10M] |
|  |  |  |  |
| 18. | a) | Solve  by Taylor series method upto 4 terms and find | [5M] |
|  | b) | Find an approximate value of  for  in steps of 0.02 from | [5M] |

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