Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18MA1007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **LINEAR ALGEBRA, TRANSFORMS AND NUMERICAL METHODS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | |  |
| 1. | List out the eigen values of A-1, if 2,3,4 are the eigen values of A. | CO1 | 1 |
| 2. | What is AAT, if A is an orthogonal matrix? | CO1 | 1 |
| 3. | When the is continuous between a and b and and are of opposite signs then the roots are between \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_. | CO2 | 1 |
| 4. | Extrapolation is defined as \_\_\_\_\_\_\_\_. | CO2 | 1 |
| 5. | State the formula for Modified Euler’s method. | CO2 | 1 |
| 6. | Bender-Schmidt recurrence relation for one dimensional equation is \_\_\_\_\_\_\_\_. | CO2 | 1 |
| 7. | Find the Laplace transforms of Sinhat. | CO3 | 1 |
| 8. | Write L{f(t)}, if f(t) is a periodic function with period T. | CO3 | 1 |
| 9. | Value of Z(n2) = \_\_\_\_\_\_\_\_. | CO4 | 1 |
| 10. | Fourier cosine transforms of f(t) is \_\_\_\_\_\_\_\_. | CO4 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | Determine the rank of matrix . | CO1 | 3 |
| 12. | Evaluate by using Simpson 1/3 rd rule with h=1. | CO2 | 3 |
| 13. | Classify the equation . | CO2 | 3 |
| 14. | Solve L(Sin2t Cos3t). | CO3 | 3 |
| 15. | Find the value of Z{ e-iat}. | CO4 | 3 |
| 16. | Estimate the chromatic number of the graph shown below:  d  c  a  b | CO5 | 3 |

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| **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | |
| 17. |  | Reduce the given quadratic form its canonical form using orthogonal transformation. | CO1 | 12 |
|  |  |  |  |  |
| 18. | a. | Using Newton Raphson method, find a root of the following equations and correct to three decimal places: . | CO2 | 6 |
| b. | Compute f(22) from the Gauss forward formulae:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | x | 20 | 25 | 30 | 35 | 40 | 45 | | f(x) | 354 | 332 | 291 | 260 | 231 | 204 | | CO2 | 6 |
|  |  |  |  |  |
| 19. | a. | Find by taylor’sseries method the value of y at x=0.1 to four places of decimal from , y(0)=1. | CO2 | 6 |
| b. | Solve the Poisson’s partial differential equation over the square with sides x=0=y,x=3=y with u=0 on the boundary and mesh length =1. | CO2 | 6 |
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| 20. | a. | Construct inverse transform of . | CO3 | 6 |
| b. | Apply convolution theorem to evaluate: . | CO3 | 6 |
|  |  |  |  |  |
| 21. | a. | Find the fourier transform of and hence evaluate . | CO4 | 6 |
| b. | Evaluate : Z(Sinnɵ). | CO4 | 6 |
|  |  |  |  |  |
| 22. | a. | Verify Cayley Hamilton theorem of A= | CO1 | 6 |
| b. | Estimate the eigen value and eigen vector of | CO1 | 6 |
|  |  |  |  |  |
| 23. | a. | Using Bisection method, solve the following equations correct to two decimal places: . | CO2 | 6 |
| b. | Use the trapezoidal and simpson 3/8th rule to estimate , taking h=0.5 | CO2 | 6 |
|  |  | **Compulsory:** | | |
| 24. |  | Find a maximum flow in the given network by using Labelling algorithm.  3  2  4  5  2  4  3  3 | CO6 | 12 |