**20CB101/20CE101/20CS101/20DS10120EC101/20EE101/20EI101/20IT101/20ME101**

**(MA01)**

**Hall Ticket Number:**

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| **I/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **July, 2021** | **Common to all branches** | | |
| **First Semester** | **Linear Algebra and ODE** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| *Answer Question No.1 compulsorily.* | | | (14X1 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |

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| 1 | Answer all questions. | | | (14X1=14 Marks) | |
|  | a) | | Define minor of a matrix. | |  |
|  | b) | | The maximum value of the Rank of a 4X5 matrix is………………… | |  |
|  | c) | | If A = then find the sum and product of the eigen values of A. | |  |
|  | d) | | Write Cayley – Hamilton theorem. | |  |
|  | e) | | Write the differential equation corresponding to Newton’s law of cooling. | |  |
|  | f) | | Find the integrating factor of ( ) = ( . | |  |
|  | g) | | Find the particular integral of | |  |
|  | h) | | Write the Wronskian value of | |  |
|  | i) | | Write the differential equation of L-R-C circuit with an emf E=E0 Sin(wt). | |  |
|  | j) | | Find the general solution of | |  |
|  | k) | | Find the value of L [ 3t ]. | |  |
|  | l) | | State first shifting property for Laplace transforms. | |  |
|  | m) | | Find the value of . | |  |
|  | n) | | Write Convolution theorem for Laplace transforms. | |  |
| **UNIT I** | | | | | |
| 2. | | a) | Use Gauss-Jordan method to find the inverse of the matrix | | 7M |
|  | | b) | For What value of ‘k’ the equations x + y + z = 1, 2x + y + 4z = k , 4x + y + 10z = k2 have a solution and solve completely in each case. | | 7M |
| **(OR)** | | | | | |
| 3. | | a) | Find the Eigen values and Eigen vectors of the matrix | | 7M |
|  | | b) | Verify Cayley – Hamilton theorem for the matrix and find its inverse. | | 7M |
| **UNIT II** | | | | | |
| 4. | | a) | Solve ( 1 + y2 ) dx + (x - ) dy = 0. | | 7M |
|  | | b) | If the air is maintained at 30oC and the temperature of the body cools from 80oC to 60oC in 12 minutes, find the temperature of the body after 24 minutes. | | 7M |
| **(OR)** | | | | | |
| 5. | | a) | Solve y. | | 7M |
|  | | b) | Solve 2xy**ꞌ** = 10x3y5 + y. | | 7M |
| **UNIT III** | | | | | |
| 6. | | a) | Solve | | 7M |
|  | | b) | Solve by the method of variation of parameters. | | 7M |
| **(OR)** | | | | | |
| 7. | | a) | Solve | | 7M |
|  | | b) | Solve | | 7M |
| **P.T.O.**  **20CB101/20CE101/20CS101/20DS10120EC101/20EE101/20EI101/20IT101/20ME101**  **(MA01)**    **UNIT IV** | | | | | |
| 8. | | a) | Find the Laplace transform of (i) (ii) | | 7M |
|  | | b) | Find the inverse Laplace transform of . | | 7M |
| **(OR)** | | | | | |
| 9. | | a) | Apply Convolution theorem to evaluate L-1 | | 7M |
|  | | b) | Solve yꞌꞌ + 5yꞌ + 6y = 5e2t ,Given y(0)=0 and yꞌ(0)=0 using Laplace transforms.. | | 7M |

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