**20CB/CE/CS/DS/EC/EE/EI/IT/ME 101(MA01)**

**Hall Ticket Number:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **I/IV B.Tech (Regular\Supplementary) DEGREE EXAMINATION** | | | |
| **April, 2022** | **Common to all branches** | | |
| **First Semester** | **Linear Algebra and ODE** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| *Answer Question No.1 compulsorily.* | | | (1X14 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | Answer all questions | | | (1X14=14 Marks) | |
|  | a) | | Write any two elementary row operations. | |  |
|  | b) | | Define Characteristic equation of a matrix. | |  |
|  | c) | | Write any two Properties of Eigen Values. | |  |
|  | d) | | Find the integrating factor of + . | |  |
|  | e) | | Write Bernoulli’s Equation form. | |  |
|  | f) | | Solve = | |  |
|  | g) | | Find the general solution of | |  |
|  | h) | | Find the P.I of + = | |  |
|  | i) | | Find the particular integral of | |  |
|  | j) | | Write the Wronskian of cos2x, sin2x. | |  |
|  | k) | | Find the Laplace transform of . | |  |
|  | l) | | Find L. | |  |
|  | m) | | Write Convolution theorem. | |  |
|  | n) | | Find L[. | |  |
| **UNIT I** | | | | | |
| 2. | | a) | Using Gauss – Jordan method , find the inverse of a matrix A = . | | 7M |
|  | | b) | Investigate for what values of simultaneous equations 2x + 3y + 5z = 9 ; 7x + 3y -2z = 8 ; 2x +3y + z = have ( i ) No Solution ( ii ) a unique solution ( iii ) an infinite number of solutions . | | 7M |
| **(OR)** | | | | | |
| 3. | | a) | Using Cayley – Hamilton theorem for the matrix A = find its inverse. | | 7M |
|  | | b) | Find the Eigen values and Eigen vectors of the matrix. | | 7M |
| **UNIT II** | | | | | |
| 4. | | a) | Solve | | 7M |
|  | | b) | If the air is maintained at 300C and temperature of the body cools from 800C to 600C in 12 minutes, find the temperature of the body after 24 minutes. | | 7M |
| **(OR)** | | | | | |
| 5. | | a) | Solve . | | 7M |
|  | | b) | Solve 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 |
| **UNIT IV** | | | | | |
| 8. | | a) | Find the Laplace transform of . | | 7M |
|  | | b) | Using Convolution theorem find the inverse Laplace transform of . | | 7M |
| **(OR)** | | | | | |
| 9. | | a) | Find the Laplace transform of the following functions  (i) (ii) | | 7M |
|  | | b) | Solve + 2 - 3y = if y(0) = y|’(0) = 0,by Laplace transform method. | | 7M |

****