**20CE/CS/CB/DS/CM/EC/EE/EI/IT/ME101/MA01**

**Hall Ticket Number:**

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| **I/IV B.Tech (Regular\Supplementary) DEGREE EXAMINATION** | | | |
| **February, 2024** | **Common to all Branches** | | |
| **First Semester** | **Linear Algebra and ODE** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsorily.*** | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | Define Elementary Transformations | CO1 | L1 | 1M |
|  | b) | Define Consistent System | CO1 | L1 | 1M |
|  | c) | What are the Eigen values of where | CO1 | L1 | 1M |
|  | d) | Write the Leibnitz linear differential equation | CO2 | L1 | 1M |
|  | e) | State Bernoulli’s equation | CO2 | L1 | 1M |
|  | f) | Write an integrating factor for homogenous differential equation for Mdx+Ndy=0 | CO2 | L1 | 1M |
|  | g) | Write the general solution of ( | CO3 | L1 | 1M |
|  | h) | Write the particular integral of | CO3 | L1 | 1M |
|  | i) | Define the Wronskian of | CO3 | L1 | 1M |
|  | j) | Write the Laplace transform of | CO4 | L1 | 1M |
|  | k) | State Convolution theorem | CO4 | L1 | 1M |
|  | l) | Find the inverse transform of | CO4 | L1 | 1M |
|  | m) | Define Linear dependence vectors | CO1 | L1 | 1M |
|  | n) | What is the solution of | CO2 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Apply Gauss Jordan method to find the inverse of the matrix | CO1 | L3 | 7M |
|  | b) | For what values of the equations have a solution and solve them completely in each case | CO1 | L3 | 7M |
|  |  | **(OR)** |  |  |  |
| 3 | a) | Find the characteristic equation of the matrix , and also find the matrix represented by | CO1 | L3 | 7M |
|  | b) | Find the Eigen values and Eigen vectors of the matrix | CO1 | L3 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Solve | CO2 | L3 | 7M |
|  | b) | If the temperature of the air is 30°C and the substance cools from 100°C to 70°C in 15 minutes, find when the temperature will be 40°C | CO2 | L3 | 7M |
| **(OR)** | | | | | |
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| 5 | a) | Solve | CO2 | L3 | 7M |
|  | b) | Solve | CO2 | L3 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Solve | CO3 | L3 | 7M |
|  | b) | Apply the method of variation of parameters to solve | CO3 | L3 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Solve | CO3 | L3 | 7M |
|  | b) | Solve | CO3 | L3 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Find the Laplace transform of | CO4 | L3 | 7M |
|  | b) | Find the inverse Laplace transforms of | CO4 | L3 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Find the Laplace transform of (i) (ii) | CO4 | L3 | 7M |
|  | b) | Apply Laplace transform method to solve given and | CO4 | L3 | 7M |

