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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 31- 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph.D. | |
| **Course Code:** MAT834 | **Course Name:** Numerical Methods with Programming Techniques | |
| **Semester**: | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **10** | **10** | **20** | **30** | **30** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 10 marks. 6Q x 10M=60Marks** | | | | |
| **1** | Evaluate by using trapezoidal rule by 12 sub intervals. | **10 Marks** | **L2** | **CO1** |
| **2** | Solve the boundary value problem using finite difference approximation choosing. | **10 Marks** | **L2** | **CO2** |
| **3** | A slider in a machine moves along a fixed straight rod. Its distance x cm along a rod is given below for various values of the time t seconds. Find the velocity of the slider and its acceleration when t=0.3 second. (Stirling method)  t 0 0.1 0.2 0.3 0.4 0.5 0.6  x 30.13 31.62 32.87 33.64 33.94 33.81 33.24 | **10 Marks** | **L2** | **CO3** |
| **4** | Solve the Poisson equation and given that and . | **10 Marks** | **L2** | **CO3** |
| **5** | Explain interpolation and extrapolation in MATLAB. What are their types? | **10 Marks** | **L2** | **CO4** |
| **6** | Explain mesh and surface 3D graphical facility provided in MATLAB. Elaborates with the creation of the grid on the graph. | **10 Marks** | **L2** | **CO5** |

**Part B**

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| --- | --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** | | | | | |
| **7.** | **a.**  **b.** | What is MATLAB? Write the basic features of MATLAB.  i) What is the use of zeros, ones and eye command in MATLAB? Explain with example.  ii) How to find the transpose of a matrix in MATLAB? Explain with one example.  iii) What is the use of script files? Explain the creation and execution of script files. | **5 Marks**  **15 Marks** | **L1**  **L3** | **CO4** |
|  | | | | | |
| **8.** | **a.**  **b.** | Briefly explain the bvp4c technique to solve a boundary value problem with an example.  Compare between script files and function files. | **15 Marks**  **5 Marks** | **L3**  **L1** | **CO5** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***