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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 :** MAT812 | **Course Name** : VALUE DISTRIBUTION THEORY AND DELAY DIFFERENTIAL EQUATION | |
| **Semester**: | **Max Marks**:100 | **Weightage**:50% |

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

**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** | State and prove Borel theorem and Hadmard theorem. | **10 Marks** | **L1** | **CO1** |
| **2** | Define meromorphic function with examples and state and prove Nevanlinna first fundamental theorem. | **10 Marks** | **L2** | **CO2** |
| **3** | Define entire function with examples and find the order & type of . | **10 Marks** | **L2** | **CO1** |
| **4** | Let be meromorphic functions in the complex plane then prove that   1. . 2. . | **10 Marks** | **L2** | **CO3** |
| **5** | Explain Painleve equations and Differential difference equations. | **10 Marks** | **L3** | **CO3** |
| **6** | Define small function and State and prove fundamental theorem of Nevanlinna involving three counting functions. | **10 Marks** | **L3** | **CO5** |

**Part B**

|  |  |  |  |  |  |
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| **Answer the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** | | | | | |
| **7.** |  | Explain linear stability of Delay differential equation. | **20 Marks** | **L3** | **CO4** |
|  | | | | | |
| **8.** |  | Suppose that is a non constant meromorphic function in the complex plane and is a ve integer then prove that    . | **20 Marks** | **L3** | **CO2** |

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