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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| Date: 04 / 01/ 2025 Time: 01:00pm – 04:00pm |

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| **School:** SOE | **Program:** B.Tech - ECE | |
| **Course Code:** ECE2003 | **Course Name:** SIGNALS AND SYSTEMS | |
| **Semester:** III | **Max Marks:**100 | **Weightage:** 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **20** | **30** | **50** |  |  |

**Instructions:**

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

**Part A**

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| **Answer ALL the Questions. 10 x 2 Marks=20 Marks** | | | | |
| **1** | Write the properties of unit Impulse function | **2 Marks** | **L1** | **CO1** |
| **2** | Evaluate | **2 Marks** | **L1** | **CO1** |
| **3** | Sketch the signal | **2 Marks** | **L1** | **CO1** |
| **4** | Find even and odd components of the signal x(t)=1-2t+3t2 | **2 Marks** | **L1** | **CO1** |
| **5** | State the property and use it to Find the Fourier Transform of , If | **2 Marks** | **L2** | **CO2** |
| **6** | What is the limitation of Fourier series? Does Fourier transform overcome this? | **2 Marks** | **L2** | **CO2** |
| **7** | Write the formula for Fourier Transform and Inverse Fourier Transform. | **2 Marks** | **L2** | **CO2** |
| **8** | Find the Fourier transform of | **2 Marks** | **L2** | **CO2** |
| **9** | Dirichlet- Jordan, a Mathematician gives sufficient conditions for an existence of Fourier series. List the Dirichlet conditions for the existence of Fourier series. | **2 Marks** | **L3** | **CO3** |
| **10** | List the properties of ROC of Laplace Transform | **2 Marks** | **L3** | **CO3** |

**Part B**

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| **Answer the Questions Total 80 Marks** | | | | | |
| **11.** | **a.** | The signal which has finite energy and zero average power is called as energy signal.  Justify the given signal,    is energy or power signal. | **10**  **Marks** | **L1** | **CO1** |
| **Or** | | | | | |
| **12.** | **a.** | Draw and verify whether the given signal is Even signal or Odd signal | **10**  **Marks** | **L1** | **CO1** |
|  |  |  |  |  |  |
| **13.** | **a.** | Find the Laplace Transform and ROC of the function | **10**  **Marks** | **L3** | **CO3** |
| **Or** | | | | | |
| **14.** | **a.** | Find the Z-Transform and plot the ROC of the function | **10**  **Marks** | **L3** | **CO3** |

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| **15.** | **a.** | Find the exponential Fourier series coefficients of the function | **10**  **Marks** | **L2** | **CO2** |
| **Or** | | | | | |
| **16.** | **a.** | State and prove Convolution in time domain property of Fourier Transform | **10**  **Marks** | **L2** | **CO2** |

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| **17.** | **a.** | The Fourier transform is a generalization of the complex Fourier series in the limit . Find the Fourier transform of the signal | **15**  **Marks** | **L2** | **CO2** |
| **Or** | | | | | |
| **18.** | **a.** | Find the Fourier transform of the signal | **15**  **Marks** | **L2** | **CO2** |

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| **19.** | **a.** | Find the Z-Transform of the function | **15 Marks** | **L3** | **CO3** |
| **Or** | | | | | |
| **20.** | **a.** | State and prove Initial Value and Final value theorem for Z-Transform. And mention the properties of ROC of ZT. | **15**  **Marks** | **L3** | **CO3** |

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| **21.** | **a.** | Prove that the signals  have the same X(s)and differ only in ROC. Also plot their ROCs | **20 Marks** | **L3** | **CO3** |
| **Or** | | | | | |
| **22.** | **a.** | Z-transform helps in system design and analysis and also checks the system's stability. Find the inverse z-transform for the given signal,  **.** | **20 Marks** | **L3** | **CO3** |

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