Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2019**

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| **Code :** | **17MA2004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Laplace Transform, Fourier Series and Transforms** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
|  | **PART-A(20X1=20 MARKS)** | | |
| 1. | Find the Laplace transform of | CO6 | 1 |
| 2. | Prove that  , where  is constant | CO4 | 1 |
| 3. | Find . | CO6 | 1 |
| 4. | Prove that Linearity property in Laplace transform. | CO4 | 1 |
| 5. | Find the Laplace transform of | CO6 | 1 |
| 6. | Find . | CO6 | 1 |
| 7. | Find the Laplace transform of | CO4 | 1 |
| 8. | Find | CO6 | 1 |
| 9. | Find the inverse Laplace transform of | CO4 | 1 |
| 10. | Find | CO6 | 1 |
| 11. | Find | CO4 | 1 |
| 12. | Find the inverse Laplace transform of | CO6 | 1 |
| 13. | Write down the Dirichlet’scondions for a function to be expanded as a Fourier series. | CO3 | 1 |
| 14. | If  is an even function in , then write the formulas for its Fourier coefficients. | CO3 | 1 |
| 15. | Find  of the Fourier series of in | CO3 | 1 |
| 16. | Define root mean square value of |  | 1 |
| 17. | State the Fourier integral theorem. | CO3 | 1 |
| 18. | Write the Parseval’s identity for Fourier transform. | CO1 | 1 |
| 19. | Prove that if is the Fourier transform of , then | CO2 | 1 |
| 20. | Find the Fourier sine transform of | CO2 | 1 |

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|  | **PART B(10 X 5= 50 MARKS)**  **(Answer any 10 from the following)** | | |
| 21. | Find | CO6 | 5 |
| 22. | Find , where | CO4 | 5 |
| 23. | Evaluate using convolution theorem. | CO4 | 5 |
| 24. | Find . | CO4 | 5 |
| 25. | Evaluate . | CO6 | 5 |
| 26. | Evaluate | CO6 | 5 |
| 27. | Find | CO4 | 5 |
| 28. | Find the half range cosine series for in | CO3 | 5 |
| 29. | Obtain the Fourier series of the function | CO3 | 5 |
| 30. | Find the complex form of the Fourier Series of  in | CO3 | 5 |
| 31. | Find Fourier transform of given by . | CO1 | 5 |
| 32. | Using parsevals identity evaluate | CO2 | 5 |

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|  | **PART C(2 X 15= 30 MARKS)**  **(Answer any 2 from the following)** | | | |
| 33. | a. | Find the Laplace transform of the periodic function  and | CO4 | 7 |
| b. | Solve , | CO4 | 8 |
| 34. | a. | Analyse harmonically the data given below and express in Fourier Series upto the third harmonic:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | : | 0 |  |  |  |  |  |  | | : | 1.0 | 1.4 | 1.9 | 1.7 | 1.5 | 1.2 | 1.0 | | CO3 | 8 |
| b. | Find the Fourier Series of the function | CO3 | 7 |
| 35. | a. | Find the Fourier transform of if and hence find the value of | CO2 | 7 |
| b. | Find the Fourier Transform of  and hence find the value of . | CO1 | 8 |

ALL THE BEST