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



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

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| **Code :** | **18MA1011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIFFERENTIAL CALCULUS, COMPLEX ANALYSIS AND LAPLACE TRANSFORM** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
|  | **PART – A (10X1=10 MARKS)** | | |
| 1. | Particular integral of is\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 2. | Write the general form of Clairaut’s equation. | CO1 | 1 |
| 3. | If then is called as\_\_\_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 4. | If then . | CO2 | 1 |
| 5. | Write down the Cauchy – Riemann equations of in polar coordinates. | CO2 | 1 |
| 6. | A solution of Laplace’s equation having continuous second-order partial derivatives is called a \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 7. | State Cauchy’s Integral theorem. | CO3 | 1 |
| 8. | Determine the poles of . | CO3 | 1 |
| 9. | L(sinh2t) = \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO4 | 1 |
| 10. | . | CO5 | 1 |

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|  | **PART – B (6 X 3 = 18 MARKS)** | | |
| 11. | Solve. | CO1 | 3 |
| 12. | Find the work done when a force moves a particle in the  plane from (0, 0) to (1, 1) along the curve | CO2 | 3 |
| 13. | Find the fixed points of the mapping. | CO2 | 3 |
| 14. | Evaluate where C is a circle of unit radius and centre at z = 1. | CO3 | 3 |
| 15. | Find. | CO4 | 3 |
| 16. | Find. | CO5 | 3 |

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| **PART - C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | | |
| 17. | a. | | Solve by method of variation of parameters. | CO1 | 6 |
| b. | | Solve. | CO1 | 6 |
|  |  | |  |  |  |
| 18. | a. | | Find the angle between the surfaces and  at  (2, -1, 2). | CO2 | 6 |
| b. | | Verify Green’s theorem for where C is the boundary of the common area between and. | CO6 | 6 |
|  |  | |  |  |  |
| 19. | a. | | If  is analytic find and *v* if . | CO2 | 6 |
| b. | | Find the bilinear transformation that maps 1, -1 and ∞ of the z-plane on to -1, -*i* and *i* of the *w*-plane. | CO2 | 6 |
|  |  | |  |  |  |
| 20. | a. | | Find. | CO4 | 6 |
| b. | | Find the Laplace transform of and . | CO4 | 6 |
|  |  | |  |  |  |
| 21. | a. | | Find using partial fraction method. | CO5 | 6 |
| b. | | Solve given using Laplace Transform. | CO5 | 6 |
|  |  | |  |  |  |
| 22. | a. | | Find the image of under the map . | CO3 | 6 |
| b. | | Find the general and singular solution of. | CO1 | 6 |
|  |  | |  |  |  |
| 23. | a. | | Find using convolution method. | CO5 | 6 |
| b. | | Evaluate where C is  using Cauchy’s Residue theorem. | CO3 | 6 |
|  |  | |  |  |  |
|  | | **Compulsory:** | | | |
| 24. | a. | | Evaluate  using contour integration. | CO6 | 12 |