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



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

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| **Code :** | **18MA1006** | Duration : | **3hrs** |
| **Sub. Name :** | **DIFFERENTIAL EQUATIONS AND COMPLEX VARIABLES** | Max. Marks : | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
|  | **PART – A (10X1=10 MARKS)** | | |
| 1. | Write the general form of Bernoulli’s equation. | CO1 | 1 |
| 2. | What is the solution of Leibnitz’s equation where P and Q are functions of x. | CO1 | 1 |
| 3. | Mention the order and degree of the differential equation . | CO2 | 1 |
| 4. | What is the value of ? | CO2 | 1 |
| 5. | Solve . | CO3 | 1 |
| 6. | State one dimensional wave equation. | CO4 | 1 |
| 7. | Write down Cauchy-Riemann equation in polar form. | CO5 | 1 |
| 8. | Check whether  is analytic or not. | CO5 | 1 |
| 9. | State Adam Bashforth Predictor formula. | CO6 | 1 |
| 10. | Write down Milne’s corrector formula. | CO6 | 1 |

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|  | **PART – B (6 X 3 = 18 MARKS)** | | |
| 11. | Solve | CO1 | 3 |
| 12. | Express in terms of Legendre Polynomials. | CO2 | 3 |
| 13. | Solve | CO3 | 3 |
| 14. | What are the various possible solutions of two dimensional heat equation? | CO4 | 3 |
| 15. | Prove that the function is harmonic. | CO5 | 3 |
| 16. | Find by Taylor’s series method the value of y at x = 0.1 from | CO6 | 3 |

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|  | **PART – C (6 X 12 = 60 MARKS)**  **( Answer any five Questions from Q.no 17 to 23)** | | | |
| 17. |  | Solve . | CO1 | 12 |
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| 18. |  | Solve . | CO2 | 12 |
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| 19. |  | Using the method of variation of parameters, solve . | CO2 | 12 |
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| 20. |  | Solve . | CO3 | 12 |
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| 21. |  | A rod 20 cm. long, with insulated sides has its ends A and B kept at C and C respectively until steady state conditions prevail. The temperature at the end B is then suddenly reduced toC and kept so. Find the subsequent temperature function at any point of the rod at any time. | CO4 | 12 |

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| 22. |  | A square plate is bounded by the lines, , and . Its faces are insulated. The temperature along the upper horizontal edge is given , while the other three edges are kept at 00C.  Find the steady state temperature distribution in the plate. | CO4 | 12 |
|  |  |  |  |  |
| 23. |  | Find the bilinear transformation which maps the points onto the points. Also find the invariant points. | CO5 | 12 |
|  |  |  |  |  |
|  | **Compulsory:** | | | |
| 24. |  | Using Euler method and Modified Euler method find y(0.3) and y(0.6) given that , . | CO6 | 12 |