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



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

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| **Code :** | **18MA1012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIFFERENTIAL CALCULUS** | **Max. Marks :** | **100** |

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| --- | --- | --- | --- |
| **Q. No.** | **Questions** | **Course outcome** | **Marks** |
|  | **PART – A (10X1=10 MARKS)** | | |
| 1. | If  find | CO1 | 1 |
| 2. | Find the degree of the homogeneous function | CO1 | 1 |
| 3. | Calculate the Particular Integral of | CO2 | 1 |
| 4. | Find the Wronskian value of  and | CO2 | 1 |
| 5. | Write the value of | CO3 | 1 |
| 6. | Write down the Legendre polynomial | CO3 | 1 |
| 7. | Find the complementary function of | CO4 | 1 |
| 8. | Find the complete solution of | CO4 | 1 |
| 9. | Evaluate  for the Fourier series | CO6 | 1 |
| 10. | Write the second harmonic expansion in Harmonic analysis. | CO6 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | If  prove that | CO1 | 3 |
| 12. | Solve | CO2 | 3 |
| 13. | Prove that | CO3 | 3 |
| 14. | Solve | CO4 | 3 |
| 15. | Express  as a half-range sine series in | CO6 | 3 |
| 16. | Write down the three possible solutions of one dimensional wave equation. | 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. | If find the value of | CO1 | | 6 |
| b. | If  and ,  find | CO1 | | 6 |
|  |  |  |  | |  |
| 18. | a. | Solve  by the method of variation of parameters. | CO2 | | 8 |
| b. | Find the particular integral of | CO2 | | 4 |
|  |  |  |  | |  |
| 19. |  | Solve in series the equation | CO3 | | 12 |
| 20. | a. | Solve | CO4 | | 8 |
| b. | Solve | CO4 | | 4 |
|  |  |  |  | |  |
| 21. | a. | Solve | CO4 | | 8 |
| b. | Solve | CO4 | | 4 |
|  |  |  |  | |  |
| 22. |  | Expand  as a Fourier series in the interval | CO6 | | 12 |
|  |  |  |  | |  |
| 23. |  | Obtain the first three coefficients in the Fourier cosine series for y, where y is given in the following table:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | : | 0 | 1 | 2 | 3 | 4 | 5 | | : | 4 | 8 | 15 | 7 | 6 | 2 | | CO6 | | 12 |
|  | **Compulsory:** | | | | |
| 24. |  | A string is stretched and fastened to two points  apart. Motion is started by displacing the string in the form  from which it is released at time  Show that the displacement of any point at a distance  from one end at time  is given by | | CO5 | 12 |