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



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

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| **Code :** | **18MA1010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATRICES AND CALCULUS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | |
| 1. | If the eigen values of the matrix A are 2,3,4, then eigen values of are \_\_\_\_\_\_. | CO1 | 1 |
| 2. | State Cayley Hamilton Theorem. | CO1 | 1 |
| 3. | \_\_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 4. | The radius of curvature of the cartesian curve y=f(x) is \_\_\_\_\_\_\_\_. | CO3 | 1 |
| 5. | Given , then find . | CO3 | 1 |
| 6. | What is the necessary condition for to have a extremum? | CO3 | 1 |
| 7. | If is an odd function, then  is equal to \_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 8. | The value of  is \_\_\_\_\_\_\_\_\_\_\_. | CO4 | 1 |
| 9. | Evaluate | CO5 | 1 |
| 10. | Write down the formula for area enclosed by the plane curves whose equations are in polar form. | CO5 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | Find the sum and product of the eigen values of | CO1 | 3 |
| 12. | Prove that | CO2 | 3 |
| 13. | Given find . | CO3 | 3 |
| 14. | Express the integral in terms of gamma function. | CO4 | 3 |
| 15. | Evaluate | CO5 | 3 |
| 16. | Evaluate | 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. |  | Find the eigen values and eigen vectors of the matrix A= | CO1 | 12 |
|  |  |  |  |  |
| 18. | a. | Prove that . | CO2 | 6 |
| b. | If , prove that | CO2 | 6 |
|  |  |  |  |  |
| 19. |  | Find the Taylor’s series expansion of in powers of  and upto terms of third degree. | CO3 | 12 |
|  |  |  |  |  |
| 20. | a. | Find the value of the integral by using partial fractions. | CO5 | 6 |
| b. | Evaluate . | CO5 | 6 |
|  |  |  |  |  |
| 21. |  | Change the order of integration in  and hence evaluate. | CO5 | 12 |
|  |  |  |  |  |
| 22. |  | Verify Cayley-Hamilton theorem for the matrix and hence compute . | CO1 | 12 |
|  |  |  |  |  |
| 23. |  | Show that the evolute of the cycloid is another cycloid. | CO3 | 12 |
|  | **Compulsory:** | | | |
| 24. | a. | Find by triple integration, the volume of the sphere . | CO6 | 6 |
| b. | Evaluate | CO5 | 6 |