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



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

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|  |  |  |  |
| **Code :** | **19MA1010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MATRICES AND CALCULUS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10 X 1 = 10 MARKS)** | | | |
| 1. | Find the eigen values of . | CO1 | 1 |
| 2. | Find the matrix corresponding to the quadratic form.. | CO1 | 1 |
| 3. | . | CO2 | 1 |
| 4. | Express in terms of exponential function. | CO2 | 1 |
| 5. | If , find . | CO3 | 1 |
| 6. | If | CO3 | 1 |
| 7. | The value of | CO4 | 1 |
| 8. | Evaluate . | CO5 | 1 |
| 9. | Write the area enclosed by the plane curves whose equations are in Cartesian form. | CO5 | 1 |
| 10. | Evaluate | 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. | If , , , evaluate  at . | CO3 | 3 |
| 14. | Express the following integral in terms of gamma function | CO4 | 3 |
| 15. | Evaluate | CO5 | 3 |
| 16. | Integrate | 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. |  | Verify Cayley-Hamilton theorem for the matrix  and hence compute . | | CO1 | 12 |
|  |  |  | |  |  |
| 18. | a. | Show that | | CO2 | 6 |
| b. | Separate into real and imaginary parts. | | CO2 | 6 |
|  |  |  | |  |  |
| 19. |  | Expand  in powers of x and y using Taylor’s theorem upto terms of the third degree. | | CO3 | 12 |
|  |  |  | |  |  |
| 20. |  | State and prove the relation between beta and gamma functions. | | CO4 | 12 |
|  |  |  | |  |  |
| 21. | a. | Find the area lying inside the cardioid and outside the circle . | | CO5 | 6 |
| b. | Change the order of integration in  and hence evaluate. | | CO5 | 6 |
|  |  |  | |  |  |
| 22. | a. | Evaluate . | | CO5 | 6 |
| b. | Evaluate | | CO5 | 6 |
|  |  |  | |  |  |
| 23. |  | Reduce the matrix  to the diagonal form. | | CO1 | 12 |
|  |  | | **Compulsory:** | | |
| 24. | a. | Calculate the volume of the solid bounded by the planes. | | CO5 | 6 |
| b. | Evaluate  Question No.24 from Module 6 | | CO5 | 6 |