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



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

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| **Code :** | **16MA1005** | **Duration :** | **3hrs** |
| **Sub. Name:** | **APPLIED MATHEMATICS - MATRICES AND CALCULUS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Find the eigen values and eigen vectors of the matrix | CO1 | 15 |
| b. | Find the sum and product of all the eigen values of | CO1 | 5 |
| **(OR)** | | | | |
| 2. |  | Reduce the quadratic form  to the canonical form. Find the nature, index and signature of the canonical form. | CO1 | 20 |
|  |  |  |  |  |
| 3. | a. | Solve given that is a root of the equation. | CO2 | 10 |
| b. | Solve | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Form the third degree equation, two of whose roots are  and 2. | CO2 | 10 |
| b. | Solve | CO2 | 10 |
|  |  |  |  |  |
| 5. |  | Find the evolute of the ellipse | CO2 | 20 |
| **(OR)** | | | | |
| 6. |  | Find the coordinates of the centre of curvature at any point of the parabola . Hence show that the evolute is | CO3 | 20 |
|  |  |  |  |  |
| 7. | a. | Evaluate | CO3 | 10 |
| b. | Find the area of the circle using double integration | CO3 | 10 |
| **(OR)** | | | | |
| 8. |  | Using triple integration, find the volume of the sphere with center at the origin and radius r. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Examine the convergence of the series | CO2 | 10 |
| b. | Show that the series  (i) converges if , diverges if and (iii) oscillates if | CO2 | 10 |