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

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**End Semester Examination – Nov/Dec – 2018**

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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. |  | Diagonalise the matrix . | CO2 | 20 |
| (OR) | | | | |  | |  | (OR) |
| 2. |  | Reduce the quadratic form − 2𝑦𝑧 + 2𝑧𝑥 + 2𝑥y to a canonical form by orthogonal reduction. | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Solve  given that  is a root of the equation. | CO1 | 10 |
| b. | Solve the equation | CO1 | 10 |
| (OR) | | | | |  | |  | (OR) |
| 4. | a. | Solve the equation | CO1 | 10 |
| b. | Solve  given that  is a root of the equation. | CO1 | 10 |
|  |  |  |  |  |
| 5. | a. | Find the evolute of the parabola | CO5 | 10 |
| b. | Find the envelope of the family of straight lines  where  is a parameter. | CO5 | 10 |
| (OR) | | | | |  | |  | (OR) |
| 6. | a. | Find the radius of curvature of the curve  at (0,0). | CO5 | 15 |
| b. | Find the centre of curvature at  on | CO5 | 5 |
|  |  |  |  |  |
| 7. | a. | Find the area of the circle. | CO3 | 10 |
| b. | Evaluate | CO3 | 10 |
| (OR) | | | | |  | |  | (OR) |
| 8. | a. | Find the volume of a sphere x2 + y2 + z2 = a2 . | CO3 | 14 |
| b. | Evaluate | CO3 | 6 |
|  | |  |  |  |  |
|  | | **Compulsory**: |  |  |  |
| 9. | a. | A person has two daughters A and B aged 13 and 16 years. He has Rs.40,000 with him now but wants that both of them should get the equal amount when they are 20 years old. How he should divide the money if it were to be deposited in a bank giving 9% compound interest per annum? | CO4 | 10 |
|  | b. | A person borrowed a sum of Rs. 3,500 on the condition to repay in 23 monthly instalments of Rs.150 and the last instalment of Rs.50. Calculate the simple interest at the rate of 5% per annum, which he has to pay as the 25thinstalment. | CO4 | 10 |