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



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

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| **Code :** | **17MA1005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BASIC MATHEMATICS FOR COMPUTER SCIENCE** | **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. | Given A = {1, 2, 3, 4}, B = {2, 4, 6, 8} and U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}. Verify De Morgan’s laws. | CO1 | 10 |
| b. | Out of the total number of 200 students appearing in an examination, 140 passed in Mathematics and 100 passed in statistics. If 40 of them failed in both Mathematics and Statistics, what percentage of students passed (i) at least in one of the two subjects? (ii) in both the subjects? | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Resolve  into partial fraction. | CO1 | 10 |
| b. | Prove that | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Find inverse of the Matrix. | CO2 | 10 |
| b. | If ,  prove that (i) ,  (ii) , (iii) If find . | CO2 | 10 |
| **(OR)** | | | | |
| 4. |  | Find the Eigen values and Eigen Vectors of the matrix. | CO3 | 20 |
|  |  |  |  |  |
| 5. | a. | Find if . | CO4 | 10 |
| b. | If find . | CO4 | 10 |
| **(OR)** | | | | |
| 6. | a. | Evaluate . | CO5 | 10 |
| b. | Evaluate . | CO5 | 10 |
|  |  |  |  |  |
| 7. | a. | If , and, then find (i) , (ii) . | CO6 | 10 |
| b. | A particle moves along the curve , ,  where ‘’ is the time. Find the components of its velocity and acceleration at in the direction . | CO6 | 10 |
| **(OR)** | | | | |
| 8. | a. | If , , find (i) ,  (ii) . | CO6 | 10 |
| b. | Find the angle between the tangents to the curve  at the point . | CO6 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Prove that is a solenoidal vector while is an irrotational vector. | CO6 | 10 |
| b. | Find the work done when a force moves a particle in the xy plane from (0,0) to (1,1) along the curve . | CO6 | 10 |