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

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

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| **Code :** | **17MA1003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BASIC MATHEMATICS FOR SCIENCES** | **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. | If show that | CO1 | | 10 |
| b. | Prove that | CO1 | | 10 |
| (OR) | | | | | |
| 2. | a. | Prove that . | CO1 | | 10 |
| b. | Prove that | CO1 | | 10 |
|  |  |  |  | |  |
| 3. | a. | If , find the real numbers and b also find the modulus of . | CO1 | | 10 |
| b. | If n is a positive integer, prove that . | CO1 | | 10 |
| (OR) | | | | | |
| 4. | a. | Find the value of *x* and *y* given that *(x+iy)(2-3i)=4+i* | CO1 | | 10 |
| b. | Find the square root of . | CO1 | | 10 |
|  |  |  |  | |  |
| 5. | a. | Find the Eigen values and Eigen vectors of the matrix | CO2 | | 15 |
| b. | Find the rank of the matrix | CO2 | | 5 |
| (OR) | | | | | |
| 6. | a. | Verify Cayley-Hamilton theorem for the matrix | | CO2 | 15 |
| b. | Investigate the consistency of the following system of equations, *2x+3y=1, x 2y=4, 4x y=6.* | | CO2 | 5 |
|  |  |  | |  |  |
| 7. | a. | Calculate mean, median and mode of the following data:   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Class | 20-40 | 40-60 | 60-80 | 80-100 | 100-120 | 120-140 | 140-160 | | Freq. | 6 | 9 | 11 | 14 | 20 | 15 | 10 | | | CO3 | 15 |
|  | b. | The two lines of regression of *y* on *x* and *x* on *y* are *4x*–5*y+33=0, 20x*–*9y=107* respectively. Find the coefficient of correlation and the mean of *x* and *y*. | | CO3 | 5 |
| (OR) | | | | | |
| 8. | a. | Three judges, A, B, C, give the following ranks. Find which pair of judges has common approach  A: 1 6 5 10 3 2 4 9 7 8  B: 3 5 8 4 7 10 2 1 6 9  C: 6 4 9 8 1 2 3 10 5 7 | CO3 | | 15 |
| b. | Define monoids with examples. | CO4 | | 5 |
|  | |  |  | |  |
|  | | **Compulsory**: |  | |  |
| 9. | a. | Four persons are chosen at random from a group consisting of 4 men, 3 women and 2 children. Find the probability that the selected group contains atleast 1 child. | CO5 | | 10 |
| b. | In a bolt factory machines A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output5, 4, and 2 percents are defective bolts. A bolt is drawn at random from the product and it is found to be defective. What are the probabilities that it was manufactured by machines A, B and C? | CO6 | | 10 |