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**D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS), VELLORE-1**

**SEMESTER EXAMINATIONS**

**NOVEMBER - 2018 15CAMA1A/15CAMA3A**

**ALLIED : MATHEMATICS - I**

**Time : 3 Hours Max. Marks : 75**

**Section – A (10 x 2 = 20)**

**Answer ALL the questions.**

1. *Find the coefficient of in the expansion of .*
2. *Sum the series*
3. *Find the cubic equation whose roots are .*
4. *Find the sum and product of the roots of the equation*
5. *Define orthogonal matrix and give an example.*
6. *Find the eigenvalue of .*
7. *If . What is ?*
8. *Expand in powers of and*
9. *If . Prove that*
10. *Define Jacobian. Hence find where*

**Section – B ( 5 x 5 = 25 )**

**Answer any Five of the following questions.**

1. *Sum the series .*
2. *Increase by 2 the roots of and hence solve it.*
3. *Using Cayley - Hamilton theorem find if .*
4. *Express as a polynomial in .*
5. *Find the radius of curvature at the point of the Folium*
6. *Establish the formula for finding using Newton’s method.*
7. *Show that*
8. *Find the derivative of*

**Section – C ( 3 x 10 = 30 )**

**Answer ALL the questions.**

1. *(a) Find the sum to infinity of the series*

*(Or)*

*(b) Solve*

1. *(a) Find the eigenvalues and eigenvectors of the matrix .*

*(Or)*

*(b) Verify Cayley Hamilton theorem for the matrix Also find .*

1. *(a) If . Prove that i)*

*ii)*

*(Or)*

*(b) If then prove that*

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