



SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

Topic: 1 – TUTORIAL III

Quadratic form to Canonical form

1. Reduce the quadratic form $2x_1x_2 + 2x_2x_3 + 2x_3x_1$ into canonical form.
2. Reduce the quadratic form $8x_1^2 + 7x_2^2 + 3x_3^2 - 12x_1x_2 - 8x_2x_3 + 4x_3x_1$ into canonical form by means of an orthogonal transformation.
3. Reduce the quadratic form $2x^2 + 5y^2 + 3z^2 + 4xy$ to canonical form by orthogonal reduction and state its nature.
4. Reduce the quadratic form $10x_1^2 + 2x_2^2 + 5x_3^2 + 6x_2x_3 - 4x_3x_1 - 4x_1x_2$ to a canonical form through an orthogonal transformation and hence find rank, index, signature, nature and also give non-zero set of values for x_1, x_2, x_3 (if they exist), that will make the quadratic form zero.
5. Reduce the quadratic form $x^2 + 5y^2 + z^2 + 2xy + 2yz + 6zx$ to canonical form and hence find its rank.



SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107



AN AUTONOMOUS INSTITUTION

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai