

## SEMESTER-III

### 1.9 Theory of Equations

(w.e.f. academic year 2020-21)

#### SEC-I

Theory: 2 credits

Theory: 2 hours /week

**Objective:** Students learn the relation between roots and coefficients of a polynomial equation, Descartes's rule of signs in finding the number of positive and negative roots if any of a polynomial equation besides some other concepts.

**Outcome:** By using the concepts learnt the students are expected to solve some of the polynomial equations.

#### Unit- I

Graphic representation of a polynomial-Maxima and minima values of polynomials-Theorems relating to the real roots of equations-Existence of a root in the general equation -Imaginary roots-Theorem determining the number of roots of an equation-Equal roots-Imaginary roots enter equations in pairs-Descartes' rule of signs for positive roots- Descartes' rule of signs for negative roots.

#### Unit- II

Relations between the roots and coefficients-Theorem-Applications of the theorem-Depression of an equation when a relation exists between two of its roots-The cube roots of unity Symmetric functions of the roots-examples.

#### Text:

- W.S. Burnside and A.W. Panton, *The Theory of Equations*

#### References:

- C. C. Mac Duffee, *Theory of Equations*
- Hall and Knight , *Higher Algebra*