Subject Code : P8MAE11

COMBINATORICS

UNIT I

Permutations and combinations - distributions of distinct objects ~ distributions of non distinct objects - Stirlings formula.

UNIT II

Generating functions. - generating function for combinations - enumerators for permutations - distributions of distinct objects into non-distinct cells - partitions of integers – the Ferrers graphs - elementary relations. .

UNIT III

Recurrence relation - linear recurrence relations with constant coefficients solutions by the technique of generating functions - a special class of nonlinear difference equations - recurrence relations with two indices.

UNIT IV

The principle of inclusion and exclusion - general formula - permutations with restriction on relative positions - derangements - the rook polynomials - permutations with forbidden positions.

UNIT V

Polya's theory of counting - equivalence classes under a permutation group Burnside theorem - equivalence classes of functions - weights and inventories of functions - Polya' s fundamental theorem – generation of Polya’s theorem

TEXT BOOK(S)

[1] C.L. Liu - Introduction of Combinatorial Mathematics, McGraw Hill, Chapters 1 to 5.

REFERENCE(S)

[1] Marshall Hall. Jr., Combinatorial Theory.
[2] H.J. Rayser, Combinatorial Mathematics, Carus, Mathematical Monograph, No.14