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UNIT II : Uniform convergence, Uniform Convergence and continuity, Uniform convergence and integration, Uniform convergence and differentiation. (7.1 to 7.18 of Chapter 7 of Textbook).

UNIT III : Equicontinuous families of functions, The Stone-Weierstrass theorem; power series, The Exponential and Logarithmic function, Trigonometric function (7.19 to 7.33 of chapter 7 and 8.1 to 8.7 of Chapter 8 of Textbook).

UNIT IV : Linear transformations, Differentiation, contraction Principle, The Inverse function Theorem, The implicit Function Theorem. (9.1 to 9.29 of Chapter 9 of Textbook).

Textbook : Principles of Mathematical Analysis by Walter Rudin, Third edition, McGraw Hill International Edition, 1976.

M104 - TOPOLOGY SX-S 104

UNIT I : Metric Spaces - Definition and some examples - open sets and closed sets - convergence, completeness and Baire's Theorem - continuous maps - Spaces of continuous functions - Euclidean and Unitary spaces.

UNIT II : Topological Spaces - Definition and examples - Elementary concepts - open bases and subbases - Weak topologies - The function algebra $C(X, \mathbb{R})$ and $C(X, \mathbb{C})$.

UNIT III : Compact, spaces - products of spaces - Tychonoff's Theorem and locally compact spaces - compactness for metric spaces - Ascoli's theorem.

UNIT IV : Separation axioms - T_1 - spaces and Hausdorff spaces - completely regular spaces and normal spaces - Urysohn's Lemma and the Tietze Extension Theorem - Urysohn's imbedding Theorem - connected spaces - The components of a space.

Scope and extent as in the book : Introduction to topology and Modern Analysis - by G.F. Simmons, McGraw-Hill Book Company, Inc. New York - International Student Edition.

SX-S 105 M105 - DISCRETE MATHEMATICS

UNIT I : Graph, Digraph, Network, multi-graph Elementary results, Structure based on connectivity. Characterization, Theorems on Trees, Tree Distances, Binary trees, Tree enumeration, Spanning Trees, Fundamental Cycles. (Chapters 1, 2 and 3 of Textbook : 1)

UNIT II : Eulerian graphs, Hamiltonian graphs, Plane and planar graphs, planar graph representation, Planarity detection, Duality, Thickness and crossing numbers. The adjacency matrix, the incidence matrix, The Cycle matrix, The Gutsetmatrix, The path matrix, (Chapters 4, 5 and 6 of Textbook 1). [Proofs for theorems in Chapter 5 and 6 are not to be asked in the exam.]

UNIT III : Lattice definition, Modular and Distributive Lattices, (Chapters 1 of Textbook II).

UNIT IV : Basic Properties : Boolean Polynomials, ideals, minimal forms of Boolean Polynomials, Application of lattices, Switching Circuits.

(Chapter 2 of Textbook II). (for Units III & IV, the material of pages 1 to '66 of Textbook II is to be covered).