MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

M. A. / M. Sc. MATHEMATICS (FINAL)

2016-17

Non-Collegiate

Note- There will be five papers in all. Paper-I: Topology and Functional Analysis and Paper-II: Discrete Mathematics will be compulsory. Each paper will be assigned six hours per week.

Paper I	Topology and Functional Analysis	100	3 Hrs.	6
Paper II	Discrete Mathematics	100	3 Hrs.	6

Optional Papers

Any three of the following paper with the permission of the Head of the Department of Mathematics & Statistics.

Paper III	Relativity and Cosmology	100	3 Hrs.	6
Paper IV	Viscous Fluid Dynamics	100	3 Hrs.	6
Paper V	Number theory	100	3 Hrs.	6
Paper VI	Numerical Analysis	100	3 Hrs.	6
Paper VII	Integral Equations and Internal Transforms	100	3 Hrs.	6
Paper VIII	Optimization Techniques	100	3 Hrs.	6
Paper IX	Advanced Topology	100	3 Hrs.	6
Paper X	Computer Programming	Th. 75 Per. 25	3 Hrs. 2 Hrs.	Th. 04 Pre. 02
Paper XI	Mathematical Theory of Statistics	100	3 Hrs.	6
Paper XII	Space Dynamics	100	3 Hrs.	6
Paper XIII	Astronomy	100	3 Hrs.	6
Paper XIV	Compressible Fluids and Magneto hydro Dynamics	100	3 Hrs.	6

Note:

* **Scheme of Examination:**

Question Paper Pattern for Examination: 100 marks

Section A: Total 10 Question will be set from five units i.e. two question from each unit. These questions require very short answer. Each question will be of one (1) mark (Total 10 marks). All the questions in section A are compulsory.

Section B: Total 10 questions will be set from five units i.e. two question from each unit. Students are required to attempt at least one question from each unit. Each question carries 10 marks (Total 50 marks). The answer of each question should be given approximately in 250 words.

Section C: Total 4 descriptive question will be set from five units of the paper, not more than one question from each unit. Each question may also have two sub-division. Students are required to answer two questions in about 500 words. Each question carries 20 marks (Total 40 marks).

** The right to information act, 2005 is applicable.

PAPER-IX
ADVANCED TOPOLOGY

TIME: 3 hours **Max. Marks: 100**

UNIT-I

Nets and filters: directed set, Net, Limit and cluster point of a net subnet, Filter, Base and sub-base of a filter limit and cluster point of filter, sub filter. Characterization of open sets; continuous functions, Hausdroff spaces and compact spaces in terms of nets and filters. The limited equivalence of nets and filters.

UNIT-II

Ultra filter, the various sets of necessary and sufficient conditions for a filter to be an ultra filter, important results on ultra-filter. Embedding and metrization, Evaluation map. Meaning of embedding, embedding lemma, Embedding theorem, meaning of metrization, Urysohn's Metrization theorem, Nagata-Smirnow Metrization theorem Compactification, Meaning of compactification. Alexandroff one point compactification, Stone-coach compactification.

UNIT-III

Paracompactness: Refinement, Locally and discrete Classes of subjects, locally finite and discrete classes, Properties of these systems. Definition of a paracompact space, properties of paracompact space, the various definitions of paracompactness for a regular topological space and their equivalence, deductions from these of some simple sufficient conditions for paracompactness; behaviour of paracompact spaces with respect to products.

UNIT-IV

Uniform spaces: Uniformity, uniforms spaces, Uniform topology and properties of uniformities. Uniformiability of a topological space, equivalence of uniformiability and Complete regularity. Uniform continuity, relation between uniform continuity and continuity. Product uniformity and topology induced by it, Cauchy filters in a uniform space and their properties, complete uniform spaces, relations between the completeness and the closedness of a sub-space of a uniform space, equivalence of the compactness of uniform space with Its compactness and totally boundedness.

UNIT-V

Function space: Meanings of a function space, topology of point wise convergence or point open topology, topology of compact convergence or compact open topology, topology of uniform convergence on compact spaces, relation between these three properties of Y which a space of functions from a set X to a top space Y possesses.

Books recommended:

1. Thron, W.J. : Topological Structure.
2. Pervin, V.J. : Foundations of General Topology.
3. Kelley; J. : General Topology