

7.D. Sharma : Through two systems.
.I.P.A. : Indian Journal of Public
Administration (State
Administration - Special
Issue.)

.. : Annual Report

सी.एम. सिंह, : राज्य प्रशासन
अशोक शर्मा एवं
सुरेश गोयल

रविन्द्र शर्मा : राज्य प्रशासन

rnals :

Indian Journal of Public Administration (New
Delhi)

Administrative change (Jaipur)

Prashashnika (Jaipur)

B.A./B.Sc. THIRD YEAR, 2009 - 2010

MATHEMATICS

**PAPER - I
ANALYSIS**

Note : The question paper will be divided into three
section A, B and C as follows:

Section A : In this section, questions will be set taking
two questions from each unit. Each question will be
of short answer type not exceeding 20 words and will
carry 3/4 mark. The candidate will be required to
attempt all the questions. (aggregating 7.5 marks).

Section B : In this section, ten questions will be set
taking two questions from each unit. The answer of
each will not exceed 250 words or two and a half
page., Each question will be of 7.5 marks. The candi-
date will be required to attempt five questions in all.
taking one question from each unit, (aggregating 37.5
marks).

Section C : In this section, four questions will be set
covering all the five units and whose answers shall
not exceed 500 words or five pages each. Each question
may have sub-parts in it and will carry 15 marks. The
candidate will be required to attempt any two ques-
tions (aggregating 30 marks).

UNIT - I

Real number system :

Field, ordered field, upper and lower bounds of a set in an ordered field. Supremum and infimum of a set and their properties.

Completeness, archimedean and density properties of an ordered field, the set \mathbb{Q} of rational numbers as a non-complete dense ordered field.

Archimedean ordered field and the set \mathbb{R} of real numbers as a complete dense Archimedean ordered field,

Equivalent sets and their examples, nature of the relations of equivalence. Denumerable and non denumerable sets, countable and uncountable sets, Nature of subsets of a countable set and that of a denumerable (countable) sets, union of denumerable (countable) sets, Denumerability of the sets of integers and rational numbers and non denumerability of the closed unit interval $[0, 1]$ and the sets of real numbers and irrational numbers.

UNIT - II

Sequence Bounded sequence, monotonic. sequence, limit of a sequence, convergent sequence, properties of convergent sequence, Cauchy first and second theorems on limits, subsequence and its properties, Cauchy sequence and its properties, Cauchy general principle of convergence, Examples of convergent sequences.

Series : Convergence and divergence of infinite series of real numbers, the necessary and sufficient conditions, various tests of convergence problems and their illustrations with regard to infinite series of positive terms.

UNIT-III

Series :

Alternating series and Leibnitz test, absolute and semi (or conditional) convergence.

Riemann Integration:

Upper and Lower Darboux sum, Upper and Lower Riemann integrals, Riemann integrability of a bounded function in a closed interval, the necessary and sufficient condition for R integrability in terms of Darboux sums, properties of R-integrable functions, Mean value theorems.

Fundamental theorem of integral Calculus.

UNIT - IV

- (i) Uniform convergence of sequences and series of functions, various tests including M_n -test and Weirstrass M-test, relations of uniform convergence with the continuity of the limit and the sum functions and also with term by term differentiation and term by term integration.
- (ii) Fourier series representation of periodic functions which are even and odd or none of these in the full interval or half the interval.