

BM-351
(Semester-V)
Real Analysis

External Marks: 40/27

Internal Marks: 10/6

Time: 3 Hours

Note: Paper setter will set nine questions in all, selecting two questions from each section and one Compulsory question consisting of five parts distributed over all four sections. Candidates are required To attempt five questions, selecting at least one question from each section and the compulsory Question.

Section-I

Riemann integral, Integrability of continuous and monotonic functions, The Fundamental theorem of integral calculus. Mean value theorems of integral calculus.

Section-II

Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability and integrability of an integral of a function of a parameter.

Section-III

Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalent metrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's category theorem, contraction Principle

Section-IV

Continuous functions, uniform continuity, compactness for metric spaces, sequential compactness, Bolzano-Weierstrass property, total boundedness, finite intersection property, continuity in relation with compactness, connectedness, components, continuity in relation with connectedness.

REFERENCES

- P.K. Jain and Khalil Ahmad: Metric Spaces, 2 nd Ed., Narosa, 2004
- T.M. Apostol: Mathematical Analysis, Narosa Publishing House, New Delhi, 1985
- R.R. Goldberg : Real analysis, Oxford & IBH publishing Co., New Delhi, 1970
- D. Somasundaram and B. Choudhary : A First Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997
- Shanti Narayan : A Course of Mathematical Analysis, S. Chand & Co., New Delhi
- E.T. Copson, Metric Spaces, Cambridge University Press, 1968.
- G.F. Simmons : Introduction to Topology and Modern Analysis, McGraw Hill, 1963.