

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Mathematics)
Semester: IV
Syllabus with Effect from: November-2013

Paper Code: PS04CMTH02	Total Credit: 4
Title Of Paper: Mathematical Methods - II	

Unit	Description in detail	Weighting (%)
I	Functionals, Euler's equation, other forms of Euler's equation, some special forms of Euler's equation, geodesics. Isoperimetric problems, several dependent variables, functionals involving higher order derivatives.	25%
II	Integral equations, types of integral equations, conversion of differential equation into an integral equation and vice versa, solution of integral equation, Integral equations of convolution type, Abel's integral equations, integro-differential equation.	25%
III	Compact operators, some properties of compact operators, compact operators on $C[a, b]$ and $L^2[a, b]$, Fredholm integral equations, Fredholm alternative theorem, solutions of Fredholm integral equations for separable kernels.	25%
IV	Bessel's equation, Laguerre's equation, Hermite equation, Sturm-Liouville equations, Conversion of various types of differential equations into Sturm-Liouville equation, their solutions.	25%

Basic Text & Reference Books:-

- B. S. Grewal, Higher Engineering Mathematics, Khanna Publs, 3rd Edition, Delhi.
- N. Kumar, An elementary course on variational problems in calculus, Narosa publishing House, New Delhi, 2005.
- B. V. Limaye, Functional analysis, 2nd Edition, New Delhi, 1996.
- S. Gupta, calculus of variations with applications, Prentice-Hall of India, New Delhi, 1999.
- S. G. Mikhlin, Integral Equations and Applications.

