BACHELLOR OF ARTS / SCIENCE
5th SEMESTER

GENERIC ELECTIVE COURSES -I (GE-I)

MM520G: MATHEMATICS / APPLIED MATHEMATICS: MATHEMATICS - I

CREDITS THEORY-4, TUTORIAL: 2

THEORY (6 CREDITS: 60 HOURS) **MAXIMUM MARKS: 60, MINIMUM MARKS: 24**

Objectives: To understand the notions of limit, continuity, differentiation and integration of a function and techniques of solving differential equations.

UNIT-1 (15 HOURS)

Cartesian Product of Sets, Relations, Types of relations, Functions, Types of functions, Composition of functions, Inverse of a function , Limit of a function, Left hand and right hand limits, Properties and evaluation of limits, Continuity of a function, Tests of continuity, Types of discontinuities.

UNIT-2 (15 HOURS)

Differentiation of a function, Rules of differentiation, Differentiation of $x^n, (ax+b)^n$, trigonometric and inverse trigonometric functions, exponential, logarithmic, hyperbolic and inverse hyperbolic functions, Successive differentiation, Leibnitz's Theorem, Partial Differentiation, Total differentiations, Euler's Theorem.

UNIT-3 (15 HOURS)

Integration as inverse process of differentiation, Indefinite and definite integrals, Integration by substitution , by parts and by partial fractions methods, Integrals of the types $\sqrt{a^2-x^2}, \sqrt{a^2+x^2}$ and $\sqrt{x^2-a^2}$, trigonometric and inverse trigonometric functions, exponential, logarithmic, hyperbolic and inverse hyperbolic functions, Reduction Formulae.

UNIT-4 (15 HOURS)

Differential equations, Order and degree of a differential equation, Differential equations of the first order and their solutions by Variables Separable Method, Solutions of homogeneous and non-homogeneous differential equations of first order, Solution of the linear differential Equation dy/dx + Py = Q, Equations reducible to linear form, Change of variables method, Bernoulli's differential equation.

TUTORIALS (2 CREDITS: 30 HOURS) **Maximum Marks: 30 Minimum Marks: 12**

21. Tutorials based on Unit I & II - **1 credit**
22. Tutorials based on Unit III & IV – **1 credit**.

Books Recommended

1. S.D. Chopra, M.L.Kochar and A.Aziz, Differential Calculus, Kapoor Publications.

2. S.D. Chopra and M.L.Kochar, Integral Calculus, Kapoor Publications.