Paper Code: BCA 101
Paper ID: 20101 **L T C**

Paper: Mathematics – I **3 1 4**

Aim: To understand the basic concepts of mathematics.
Objectives

- To get the knowledge about the matrices, determinants and limits.
- To study the basics of differential and integral calculus

INSTRUCTIONS TO PAPER SETTERS:	**Maximum Marks : 75**
1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.	
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks	

UNIT - I
DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen - Vectors of a Matrix, Caley-Hamilton Theorem (without proof) **[No. of Hrs: 12]**

UNIT – II
LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities. **[No. of Hrs: 10]**

UNIT-III
DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Asymptote, Successive Differentiation & Liebnitz Theorem. **[No. of Hrs: 12]**

UNIT – IV
INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and transcedental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions. **[No. of Hrs: 10]**

TEXT BOOKS:
[T1] Kresyig E., "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons,1999.
[T2] Babu Ram, "Engineering Mathematics", Pearson Education.
[T3] Apostol Tom M, Calculus, Vol I and II John Wiley (2003).
REFERENCE BOOKS:
[R1] B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.
[R2] H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.
[R3] Shanti Narayan, "Differential Calculas", S.Chand & Company, 1998