

**BOARD OF INTERMEDIATE EDUCATION
A.P., HYDERABAD**

**BRIDGE COURSE IN
MATHEMATICS – I
FOR Bi.P.C. FIRST YEAR STUDENTS**

DETAILED SYLLABUS

I. ALGEBRA

(4 Periods)

1. Logarithms:
- 1.1. Definition and introduction of common logarithms.
 - 1.2. Statement of theorems (without proofs)
 - (a) $\log_a (MN) = \log_a M + \log_a N$
 - (b) $\log_a \left(\frac{M}{N}\right) = \log_a M - \log_a N$
 - (c) $\log_a M^K = K \log_a M$
 - (d) $\log_a M = \log_b M \cdot \log_a b$.
 - 1.3. Simple Problems on logarithms.

II. VECTOR ALGEBRA:

(20 periods)

2. Addition of vectors:

- 2.1. Introduction and definition of a vector as a directed line segment.
- 2.2. Types of vectors – collinear, parallel, like, unlike, coplanar and non - coplanar vectors etc.,
- 2.3. Addition of vectors – properties -
- 2.4. Scalar multiplication of a vector -
- 2.5. Angle between two non – zero vectors – section formulae – centroid of a triangle.
- 2.6. Linear combination, linearly dependent and independent system of vectors
- 2.7. Orthonormal unit triad – modulus of a vector etc.
- 2.8. Vector equations of line and plane.

3. Multiplication of vectors:

- 3.1. Scalar Product of two vectors, geometrical interpretation, orthogonal projection, properties of scalar product.
- 3.2. Simple identities on scalar product.
- 3.3. Vector product – Geometrical interpretation – properties -
- 3.4. Vector area of triangle and parallelogram – simple problems.

III TRIGONOMETRY:

(9 periods)

4. Trigonometric Functions:

- 4.1. Trigonometric ratios of compound angles
- 4.2. Multiple and sub multiple angles -
- 4.3. Transformations.

(Simple Problems related to results without proofs)

IV. COORDINATE GEOMETRY:

(10 periods)

5. The Straight line:

- 5.1. Equations of a straight line in different forms -
- 5.2. Angle between two lines – conditions for parallel and perpendicular lines.
- 5.3. Concurrent lines – point of concurrence and condition for concurrency of three lines.
- 5.4. Foot of the perpendicular and image relations (no proofs) – simple problems.

V. CALCULUS:

(32 periods)

6. Functions, limits and continuity:

- 6.1. Types of functions – graphs of $|x|$, $\frac{|x|}{x}$, $[x]$, e^x , \log^x functions – domain and range –
- 6.2. Definition of limit – left hand and right hand limits – properties (without proofs).
- 6.3. Standard limits – (no proofs)
- 6.4. Continuity and discontinuity of functions – simple illustrations.

7. Differentiation:

- 7.1. Definition of a derivative – some elementary results on differentiation – various functions.
- 7.2. Methods of differentiation – sum, difference, product and quotient rules (without proofs).

8. Applications of differentiation:

- 8.1. Geometrical interpretation of a derivative – Tangent and normal equations at a point – length of tangent, normal, sub tangent, sub normal.
- 8.2. Angle between two curves – orthogonality of curves.
- 8.3. Behaviour of functions – increasing and decreasing nature.
- 8.4. Extremum values – maxima and minima (only simple problems).

9. Partial Differentiation:

- 9.1. First and second order partial derivatives – simple problems.
- 9.1. Homogeneous functions – Euler's theorem (statement only) – simple applications.

Total Number of Periods: 75

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