

**Asian Educational Institute, Patiala (PB).**  
**(An Autonomous College)**  
**School of Science and Mathematics**



**SYLLABUS**

**B.Sc./ B.Sc(Hons.) & B.A. /B.A(Hons.)**  
**Mathematics- (Major, Minor, IDC/MDC and SEC)**  
**(Semester- I, II)**

**Session: 2025-2026**

# ASIAN EDUCATIONAL INSTITUTE, PATIALA (PB)

UG PROGRAMME (Bachelor of science)

B.Sc/B.Sc(Honours)/B.A./B.A.(Honours)

SESSION: 2025-2026

Code	Title of Paper	Hours (Per Week)	Max. Marks			Credits	Exam Time (Hours )
SEMESTER-I			Total	Ext.	Int.		
BMATH101T	MAJ: Algebra and Trigonometry	04	100	70	30	04	03
BMATH101T(M)	MIN: Algebra and Trigonometry	04	100	70	30	04	03
BSEC101	SEC: Numerical analysis for system of linear equations	03	100	70	30	03	03
BMDC101	MDC: Quantitative ability-1/ Theory of equations	03	100	70	30	03	03

SEMESTER-II							
BMATH102T	MAJ: Calculus-I	04	100	70	30	04	03
BMATH102T(M)	MIN: Calculus-I	04	100	70	30	04	03
BSEC102	SEC: Numerical Analysis/Calculation Skills with Vedic Mathematics	03	100	70	30	03	03
BMDC102	MDC: Quantitative Ability-II/ Coordinate geometry	03	100	70	30	03	03

**Semester-I**  
**ALGEBRA AND TRIGONOMETRY**  
**Paper Code: BMATH101T**  
**Major Theory**

**Max. Marks: 100**  
**External Marks: 70 Marks**  
**Internal Assessment: 30 Marks**  
**Pass Marks: 35%**

**Credits: 04**  
**Total Teaching hours: 55**

**Course Outcomes:** The students will be able to:

**CO1:** To understand D' Moivre's theorem, applications of De Moivre's theorem.

**CO2:** To know about exponential, logarithmic, direct and inverse circular and hyperbolic functions of a complex variable.

**CO3:** To understand summation of series including Gregory series.

**CO4:** To know Hermitian and Skew-Hermitian matrices, linear dependence of row and column vectors.

**CO5:** Determine the sum of infinite Binomial Series, the rank of a matrix, eigen values, eigen vectors and solve linear system of equations using matrices.

**INSTRUCTIONS FOR THE PAPER SETTER**

The Question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having ten short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the section A and B and compulsory question of Section C.

**SECTION-A**

Principle of mathematical induction, Recall of binomial theorem for positive index, properties of binomial coefficients, summation of infinite binomial series. Solution of trigonometric equations. De Moivre's theorem, application of De Moivre's theorem including primitive  $n$ th root of unity, expansions of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\sin^n \theta$ ,  $\cos^n \theta$  ( $n \in \mathbb{N}$ ), summation of series including Gregory series, the exponential, logarithmic, direct and inverse circular and hyperbolic functions of a complex variable.



## SECTION-B

Recall of determinant of a matrix, properties of determinants, Hermitian and skew-Hermitian matrices, linear dependence of row and column vectors, row rank, column rank and rank of a matrix and their equivalence, eigen-values, eigen-vectors and characteristic equation of a matrix, theorems on consistency of a system of linear equations (both homogeneous and non-homogeneous), Cayley-Hamilton theorem and its use in finding inverse of a matrix, diagonalization.

### BOOKS PRESCRIBED:

1. K.B. Datta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
2. S.R. Knight and H.S. Hall : Higher Algebra, H.M Publications, 1994.
3. Shanti Narayan and P. K. Mittal : A text book of matrices, S.Chand and Co., New Delhi, Revised Edition, 2007.





**Semester-I**  
**ALGEBRA AND TRIGONOMETRY**  
**Paper Code: BMATH101T(M)**  
**Minor Theory**

**Max. Marks: 100**

**External Marks: 70 Marks**

**Internal Assessment: 30 Marks**

**Pass Marks: 35%**

**Credits: 04**

**Total Teaching hours: 55**

**Course Outcomes:** The students will be able to:

**CO1:** To understand D' Moivre's theorem, applications of D' Moivre's theorem.

**CO2:** To know about exponential, logarithmic, direct and inverse circular and hyperbolic functions of a complex variable.

**CO3:** To understand summation of series including Gregory series.

**CO4:** To know Hermitian and Skew-Hermitian matrices, linear dependence of row and column vectors.

**CO5:** Determine the sum of infinite Binomial Series, the rank of a matrix, eigen values, eigen vectors and solve linear system of equations using matrices.

**INSTRUCTIONS FOR THE PAPER SETTER**

The Question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having ten short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the section A and B and compulsory question of Section C.

**SECTION-A**

Principle of mathematical induction, Recall of binomial theorem for positive index, properties of binomial coefficients, summation of infinite binomial series. Solution of trigonometric equations. D' Moivre's theorem, application of D' Moivre's theorem including primitive  $n$ th root of unity, expansions of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\sin^n \theta$ ,  $\cos^n \theta$  ( $n \in \mathbb{N}$ ), summation of series including Gregory series, the exponential, logarithmic, direct and inverse circular and hyperbolic functions of a complex variable.



## SECTION-B

Recall of determinant of a matrix, properties of determinants, Hermitian and skew-Hermitian matrices, linear dependence of row and column vectors, row rank, column rank and rank of a matrix and their equivalence, eigen-values, eigen-vectors and characteristic equation of a matrix, theorems on consistency of a system of linear equations (both homogeneous and non-homogeneous), Cayley-Hamilton theorem and its use in finding inverse of a matrix, diagonalization.

### BOOKS PRESCRIBED:

1. K.B. Datta: Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
2. S.R. Knight and H.S. Hall : Higher Algebra, H.M Publications, 1994.
3. Shanti Narayan and P. K. Mittal : A text book of matrices, S.Chand and Co., New Delhi, Revised Edition, 2007.



**(Semester I)**  
**Numerical Analysis for System of Linear Equations**  
**Paper Code: BSEC101**  
**Skill Enhancement Course (SEC)**

**Max. Marks: 100**  
**External Marks: 70 Marks**  
**Internal Assessment: 30 Marks**  
**Passing Marks: 35%**

**Credits: 03**  
**Total Teaching hours: 40**

Course Outcomes:	
CO1	The main objective of this course is to introduce students to numerical techniques.
CO2	The students will be able to solve system of algebraic equations
CO3	They will be able to determine inverse of a matrix.
CO4	Students will be able to solve linear system equations using math based Softwares.

**INSTRUCTIONS FOR THE PAPER SETTER**


The question paper will consist of three sections A, B and C. Each question Sections A and B will have two questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having five short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting one question from each of the Section A and B and compulsory question of Section C.

**Section A**

ill conditioned equations and ill-consistency of equations. Definition and properties of matrices. Rank of a matrix, augmented matrix, Cramer's rule. Gauss elimination method, inverse of a matrix using Gauss elimination method. Solution of linear equations using Gauss elimination method.



## Section B

Inverse of matrix and solution of linear system of equations by Gauss Jordan method, LU decomposition, Gauss Jacobi method, Gauss Siedel method. Solution of eigen values by Householder method, Power method. SOR method. Convergence of iterative methods.

### BOOKS PRESCRIBED:

1. Arnold Neumaier: Introduction to Numerical Analysis, Cambridge University Press, 2001.
2. Carl Erik Froberg: Introduction to Numerical Analysis, 2<sup>nd</sup> Edition, Addison Wesley Publishing Company, 1969.
3. Elements of Numerical Analysis: R.S. Gupta, Macmillan India Limited, 2009.





**(Semester I)**  
**QUANTITATIVE ABILITY-I**  
**Paper Code: BMDC101**  
**Multidisciplinary Course (MDC)**

**Max. Marks: 100**

**External Marks: 70 Marks**

**Internal Assessment: 30 Marks**

**Passing Marks: 35%**

**Credits: 03**

**Total Teaching hours: 40**

Course Outcomes:	
CO1	Able to develop logical reasoning that are necessary for building a stable career foundation.
CO2	Able to learn various calculations which are important in daily life
CO3	Able to develop numerical fluency
CO4	Able to develop logical thinking that assist in developing hypotheses, testing the derived hypotheses and finally drawing conclusions
CO5	Students will be able to learn Cognitive skills such as problem solving, decision making, critical thinking.

**INSTRUCTIONS FOR THE PAPER SETTER**

The question paper will consist of three sections A, B and C. Each question Sections A and B will have two questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having 10 short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.



## SECTION-A

Number System: - Types of Real Numbers, How to find that a given number is prime or not, Divisibility rules, Cyclicity (Finding last digit and last two digit of a number), Factors, Multiples, Application of HCF and LCM. Highest power dividing a factorial, Remainders, Euler Totient function, Wilson's theorem (all theorem without proof only applications).

## SECTION – B

Percentage – Relation between fraction and percentage, Change of Base, Successive percentage changes, Profit Loss and Discount, Average, Mixtures and Alligations, Word problems of average, Ratio and Proportion, Simple Interest and Compound Interest.

### BOOKS PRESCRIBED:

- (i) Quantitative Aptitude by R.S. Aggarwal, S. Chand publications
- (ii) Quantitative Aptitude by Arun Sharma, McGraw Hill Education, India
- (iii) Maths in Moments Quantitative Aptitude, Arihant Publications limited.



**(Semester I)**  
**Theory of Equations**  
**Paper code:BMDC101**  
**Multidisciplinary Course(MDC)**

**Max. Marks: 100**  
**External Marks:70 Marks**  
**Internal Assessment:30 Marks**  
**Passing Marks: 35%**

**Credits: 03**  
**Total Teaching hours: 40**

<b>Course Outcomes:</b>	
<b>CO1</b>	Able to develop logical reasoning that are necessary for building a stable career foundation.
<b>CO2</b>	Able to learn and make the algorithms
<b>CO3</b>	Able to develop numerical fluency
<b>CO4</b>	Able to develop understanding will be helpful in developing hypotheses.

**INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having 10 short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 10 marks and Section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

**Section-A**

General properties of polynomials, Graphical representation of a polynomial, maximum and minimum values of a polynomial, Euclid's Algorithm, Greatest Common Divisor, Unique Factorization of Polynomial over a field F of numbers (Statement Only), Fundamental Theorem of Algebra (Statement only), Roots and their Multiplicity.

**Section-B**

General properties of equations, Relationship between the roots and the coefficients, Fundamental theorem of symmetric polynomials (without proof), Evaluation of symmetric functions of roots,



Rational roots of polynomials with integral coefficients, Descarte's rule of signs positive and negative rule.

**BOOKS PRESCRIBED:**

1. Burnside, W. S. and Panton, A. W., The Theory of Equations, Dublin University Press, 1954.
2. MacDuffee, C. C., Theory of Equations, John Wiley & Sons Inc., 1954.
3. Kishan, H., Theory of Equations, Atlantic Publications, 2022

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**Semester-II**  
**CALCULUS-I**  
**Subject Code: BMATH102T**  
**Major Theory**

**Max. Marks: 100**  
**External Marks: 70 Marks**  
**Internal Assessment: 30 Marks**  
**Pass Marks: 35%**

**Credits: 04**  
**Total Teaching hours: 55**

**Course Outcomes:**

- CO1:** To understand the order completeness properties of real numbers.
- CO2:** Able to learn basic properties of limits, infinite limits, indeterminate forms.
- CO3:** To understand Continuous functions, types of discontinuities, continuity of composite functions.
- CO4:** To know Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, their geometric interpretation and applications.
- CO5:** Find limits, infinite limits, indeterminate forms, understand hyperbolic, inverse hyperbolic functions of real variable and their derivatives.

**INSTRUCTIONS FOR THE PAPER- SETTER**

The Question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having 10 short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the section A and B and compulsory question of Section C.

**Section-A**

**Properties of real numbers:** Order property of real numbers, bounds, l.u.b. and g.l.b., order completeness property, archimedian property of real numbers.

**Limits:**  $\epsilon$ - $\delta$  definition of the limit of a function, basic properties of limits, indeterminate forms, infinite limits.



**Continuity** : Continuous functions, types of discontinuities, continuity of composite functions, sign of a function in a neighbourhood of point of continuity, continuity of  $f(x)$ , maximum and minimum value theorem, intermediate value theorem.

### Section-B

**Mean value theorems**: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem and their geometric interpretation and applications, Taylor's theorem, Maclaurin's theorem with various forms of remainders and their applications. exponential functions, trigonometric functions, hyperbolic, inverse hyperbolic functions of a real variable and their derivatives, successive differentiations, Leibnitz theorem, applications of derivatives: Tangents and normals, differentials and approximations, errors.

### BOOKS PRESCRIBED:

1. J.D. Murray and M. R. Spiegel: Theory and Problems of Advanced Calculus, Schaum's outline Series. Schaum Publishing Co. New York
2. P.K. Jain and S. K. Kaushik : An Introduction to real analysis, S. Chand and Co. , New Delhi, 2000.
3. Gorakh Prasad : Differential calculus, Pothishala Private Ltd. Allahabad.
4. Shanti Narayan and P.K. Mittal: Differential Calculus, Edition 2006, S.Chand& Co., New Delhi.



**Semester-II**  
**CALCULUS-I**  
**Paper Code: BMATH102T(M)**  
**Minor Theory**

**Max. Marks: 100**  
**External Marks: 70 Marks**  
**Internal Assessment: 30 Marks**  
**Pass Marks: 35%**

**Credits: 04**  
**Total Teaching hours: 55**

**Course Outcomes:**

**CO1:** To understand the order completeness properties of real numbers.

**CO2:** Able to learn basic properties of limits, infinite limits, indeterminate forms.

**CO3:** To understand Continuous functions, types of discontinuities, continuity of composite functions.

**CO4:** To know Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, their geometric interpretation and applications.

**CO5:** Find limits, infinite limits, indeterminate forms, understand hyperbolic, inverse hyperbolic functions of real variable and their derivatives.

**INSTRUCTIONS FOR THE PAPER- SETTER**

The Question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having 10 short answer type questions covering the entire syllabus uniformly. Each question in sections A and B will be of 10 marks and section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the section A and B and compulsory question of Section C.

**Section-A**

**Properties of real numbers:** Order property of real numbers, bounds, l.u.b. and g.l.b., order completeness property, archimedian property of real numbers.

**Limits:**  $\epsilon$ - $\delta$  definition of the limit of a function, basic properties of limits, indeterminate forms, infinite limits.



**Continuity** : Continuous functions, types of discontinuities, continuity of composite functions, sign of a function in a neighbourhood of point of continuity, continuity of  $f(x)$ , maximum and minimum value theorem, intermediate value theorem.

### Section-B

**Mean value theorems**: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem and their geometric interpretation and applications, Taylor's theorem, Maclaurin's theorem with various forms of remainders and their applications. exponential functions, trigonometric functions, hyperbolic, inverse hyperbolic functions of a real variable and their derivatives, successive differentiations, Leibnitz theorem, applications of derivatives: Tangents and normals, differentials and approximations, errors.

### BOOKS PRESCRIBED:

1. J.D. Murray and M. R. Spiegel: Theory and Problems of Advanced Calculus, Schaum's outline Series. Schaum Publishing Co. New York
2. P.K. Jain and S. K. Kaushik : An Introduction to real analysis, S. Chand and Co. , New Delhi, 2000.
3. Gorakh Prasad : Differential calculus, Pothishala Private Ltd. Allahabad.
4. Shanti Narayan and P.K. Mittal: Differential Calculus, Edition 2006, S.Chand& Co., New Delhi.





**(Semester II)**  
**Numerical Analysis**  
**Paper Code: BSEC102**  
**Skill Enhancement Course (SEC)**

**Max. Marks: 100**

**External Marks: 70 Marks**

**Internal Assessment: 30 Marks**

**Passing Marks: 35%**

**Credits: 03**

**Total Teaching hours: 40**

Course Outcomes:	
CO1	To develop skills to solve mathematical problems using numerical methods.
CO2	Student will be able to use numerical techniques to find roots of non linear equations.
CO3	Student will be able to analyse and estimate the errors in numerical solutions.
CO4	Will develop critical thinking skills to choose appropriate numerical method

**INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three sections A, B and C. Sections A and B will have two questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having five short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 10 marks and Section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

**Section A**

Propagation of error, Numerical cancellation and computation of functions, Arithmetic Expressions, Numbers, operations and elementary functions, Numerical stability, and interval arithmetic. Algebraic and Transcendental: Bisection method, Regula falsi method, Secant method, Newton Raphson method, Rate of convergence.



## Section B

Operators and their properties, Forward Backward and central finite differences, Divided difference formula.

### BOOKS PRESCRIBED:

1. Arnold Neumaier: Introduction to Numerical Analysis, Cambridge University Press, 2001.
2. Carl Erik Froberg: Introduction to Numerical Analysis, 2<sup>nd</sup> Edition, Addison Wesley Publishing Company, 1969.
3. Elements of Numerical Analysis: R.S. Gupta, Macmillan India Limited, 2009.



**(Semester II)**  
**Calculation Skills with Vedic Mathematics**  
**Paper Code: BSEC102**  
**Skill Enhancement Course (SEC)**

**Max. Marks: 100**

**External Marks: 70 Marks**

**Internal Assessment: 30 Marks**

**Passing Marks: 35%**

**Credits: 03**

**Total Teaching hours: 40**

<b>Course Outcomes:</b>	
<b>CO1</b>	To develop skills to solve mathematical problems using classical methods.
<b>CO2</b>	Student will be able to use classical techniques to solve equations.
<b>CO3</b>	Student will be able to analyse and estimate the product and division.
<b>CO4</b>	Will develop critical thinking skills to choose appropriate method.

**INSTRUCTIONS FOR THE PAPER SETTER**

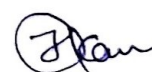
The question paper will consist of three sections A, B and C. Sections A and B will have two questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having five short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 10 marks and Section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

**Section A**

Introduction to Vedic Mathematics and Multiplication, Brief Introduction to Sutras and Upsutras of Vedic Mathematics, Vinculam Numbers and their Applications in the formation of Tables, Multiplication using Sutras- Ekadhikena, Purvena, Urdhva- tiryagbhyam, Nikhilam Navatah Carman Dastah, Combined Operations in Addition and Subtraction of Products and Verification of Results in Products using Beejank.



## Section B

Square using Nikhilam and Duplex, Addition and Subtraction of of Squared Numbers, Square Root by Sutra - Nikhilam and Duplex, Cube by Sutra- Anurupyena and Nikhilam, Cube root by Vilokanam up to 9 Digits Numbers Division and Divisibility Division by Sutras - Nikhilam Navatascarman Dastah, Paravartya Yojayet and Dhvajank, Divisibility (2-99) by Sutra- Ekadhikena Purvena Ekanyunena Purvena

### BOOKS PRESCRIBED:

1. Vedic Mathematics, *Moti Lal Banarasi Das, New Delhi*
2. Vedic Ganita Vihangama Drishti-1, *Siksha Sanskriti Uthana Nyasa, New Delhi*
3. Vedic Ganita Praneta, *Siksha Sanskriti Uthana Nyasa, New Delhi*
4. Vedic Mathematics Past, Present and Future, *Siksha Sanskriti Uthana Nyasa, New Delhi*  
*Leelavati, Chokhambba Vidya Bhavan Varanasi*
5. *Bharatiya Mathematicians, Sharda Sanskrit Sansthan, Varanasi*





**(Semester II)**  
**Quantitative Ability-II**  
**Paper code:BMDC102**  
**Multidisciplinary Course(MDC)**

**Max. Marks: 100**  
**External Marks:70 Marks**  
**Internal Assessment:30 Marks**  
**Passing Marks: 35%**

**Credits: 03**  
**Total Teaching hours: 40**

Course Outcomes:	
CO1	Students will be able to develop logical reasoning that are necessary for building a stable career foundation
CO2	Able to solve real world problems
CO3	Able to solve complex problems involving speed, distance and time.
CO4	Able to understand the various ways of selection and arrangement of items from a given set
CO5	Students will be able to learn Cognitive skills such as problem solving, decision making, critical thinking.

**INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having ten short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 10 marks and Section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

**Section A**

Time and Work, Time Speed Distance-Relationship, Average Speed, Relative speed, Problems of Trains, Boats and stream, Circular motion. Area of two-dimensional geometric figures: triangles, quadrilaterals, circle. Volume and surface area: Cuboid, cylinder, cone, sphere. Heights and Distances.



## SECTION – B

Algebra- Polynomials, Elementary curves, Remainder Theorem, System of Linear equations, Quadratic equations, Graphical interpretations of Discriminant, Vieta's formula, Finding roots by intersection of graphs. Permutation and Combination.

### BOOKS PRESCRIBED:

- (i) Quantitative Aptitude by R.S. Aggarwal, S. Chand publications
- (ii) Quantitative Aptitude by Arun Sharma, McGraw Hill Education, India
- (iii) Maths in Moments Quantitative Aptitude, Arihant Publications limited



**(Semester II)**  
**Coordinate Geometry**  
**Paper code: BMDC102**  
**Multidisciplinary Course (MDC)**

**Max. Marks: 100**  
**External Marks: 70 Marks**  
**Internal Assessment: 30 Marks**  
**Passing Marks: 35%**

**Credits: 03**  
**Total Teaching hours: 40**

Course Outcomes:	
CO1	Students will be able to develop logical reasoning that are necessary for building a stable career foundation
CO2	Able to solve real world problems
CO3	Able to solve complex problems involving speed, distance and time.
CO4	Able to understand the various ways of selection and arrangement of items from a given set
CO5	Students will be able to learn Cognitive skills such as problem solving, decision making, critical thinking.

**INSTRUCTIONS FOR THE PAPER-SETTER**

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having ten short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 10 marks and Section C will be of 30 marks.

**INSTRUCTIONS FOR THE CANDIDATES**

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C

**Section A**

Cartesian Coordinate System: definition and basic concepts. Distance formula: derivation and applications. Midpoint formula: derivation and applications. Section formula: Internal and external division. Equation of a line: Slope intercept form, point slope form, standard form. Parallel and perpendicular lines: Conditions and properties. Distance from a point to a line : formula and application. Angle between two lines: calculation and interpretation. Intersection point of two lines. Equation of a circle: Standard and general form, Tangents to a circle, Circle and line intersection.



### Section B

Conic sections: Parabola: definition, standard form, properties.

Ellipse: definition, standard form, foci, properties.

Hyperbolas: definition, standard form, properties.

### BOOKS PRESCRIBED:

1. "Coordinate Geometry" by S.L. Loney.
2. Text Book on Coordinate Geometry, by Gorakh Prasad and H.C.Gupta.

