DEPARTMENT OF HIGHER EDUCTION GOVT. OF M. P.
Scheme of Examination and Syllabus for Annual Exam System
B. Sc. /B. A. I year
Academic Session: 2019-20

Recommended by Board of Studies, Department of Mathematics,
St. Aloysius College (Auto.), Jabalpur

Paper Number & Title of the Paper	Paper-wise Maximum Marks	Total Theory Marks	Minimum Passing Marks in Theory	Internal Assessment Maximum Marks	Minimum passing Marks in Internal Assessment Marks	Practical Maximum Marks	Practical Passing Marks	Total
I-Algebra & Trigonometry	40	120	40	Ist term (3 months) 10 IInd term (6 months) 20 Total=30	10	...	...	150
II-Calculus & Differential Equations	40							
III-Vector Analysis & Geometry	40							

Note: There will be three sections in each paper. All questions from each section will be compulsory.

Section- A (5 marks): This section will contain 5 objective type questions. One from each unit, with the weightage of 1 mark.

Section- B (10 marks): This section will contain 5 short answer type questions (each having internal choice). One from each unit, with the weightage of 2 marks.

Section- C (25 marks): This section will contain 5 long answer type questions (each having internal choice). One from each unit, with the weightage of 5 marks.

There should be 12 teaching periods per week for mathematics like other Science Subjects.

(6 Period Theory + 6 Period Practical)

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College with Potential for Excellence by UGC
DST-FIST supported
BACHELOR IN SCIENCE (B.Sc.)
Session 2019-20

Max .Marks	:	40
Class	:	BSc/B.A
Year	:	First
Subject	:	Mathematics
Paper	:	I
Title	:	**Algebra and Trigonometry**

Unit I: Rank of Matrix, Normal and Echelon Form of Matrix, Characteristic Equations of a Matrix, Eigen values, Eigen vectors, Linear Independence of row and column matrix.

Unit II: Cayley's Hamilton Theorem and its use in finding inverse of a matrix, Application of Matrix to solve a System of linear (Homogeneous and Non Homogeneous) equations. theorems on consistency and inconsistency of a system of linear equations, solving system of linear equations up to three unknowns

Unit III: Relation between the roots and coefficients of a general polynomial equation in one variable, transformation of equations, Reciprocal equations, Descartes's rule of signs

Unit IV: Logic: Logical connectives, Truth tables, Tautology, Contradiction, Logical equivalence, algebra of propositions, Boolean algebra- Definition and properties, Boolean Function, Switching circuits and its applications, Logic gates and circuits

Unit V: Introduction to Congruence Modulo, Addition & Multiplication of Congruence Modulo. Its Applications

De-Moivre's theorem and its applications, direct and inverse circular and hyperbolic functions, expansion of trigonometric functions, logarithm of complex quantities, Gregory's series and summation of trigonometric series.

Test Books :

1.S.L.Loney –Plane Trignometry Part-II.

2.K.B. Datta – Matrix and Linear Algebra ,Prentice Hall of India Pvt. Ltd., New Delhi 2000.

3.Chandrika Prasad – A Text Book on Algebra and Theory of Equations, Pothishala Pvt.,Ltd. Allahabad.

4.C.L. Liu- Elements of Discrete Mathematics(Second Edition),McGraw Hill, International Edition, Computer Science Series 1986

5. मध्यप्रदेश हिंदी ग्रंथ अकादमी की पुस्तके ।

Reference Books:

1. H.S. Hall and S.R Knight-Higher Algebra H.M Publications, 1994.

2. N.Jocobson-Basic Algebra Vol.I and II ,W.H.Freeman.

3. I.S.Luther and I.B.S Passi – Algebra Vol I and II .Narosa Publishing House

4. N.Saran and R.S Gupta –Analytical Geometry of Three Dimensions, Pothishala Pvt. Ltd. Allahabad

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Max. Marks	:	40
Class	:	BSc/B.A
Year	:	First
Subject	:	Mathematics
Paper	:	II
Title	:	**Calculus and Differential Equations**

UNIT – I Successive differentiation, Leibnitz theorem , Maclaurin's and Taylor's series expansions, Asymptotes .

UNIT – II Curvature, tests for concavity and convexity, points of inflexion, multiple points, tracing of curves in Cartesian and polar coordinates.

UNIT – III Integration transcendental functions, Definite Integrals, Reduction formulae, Quadrature, Rectification.

UNIT – IV Linear differential equation and equations reducible to the linear form, Exact differential equations, first order and higher degree equations solvable for x, y and p, Clairaut's equation and singular solutions, geometrical meaning of a differential equation, Orthogonal trajectories.

UNIT – V Linear differential equation with constant coefficients, Homogeneous linear ordinary differential equations, Linear differential equations of second order, transformation of equations by changing the dependent variable/ independent variable , method of variation of parameters.

Text Books :

1. Gorakh Prasad- Differential Calculus, Pothishala Private Ltd., Allahabad.
2. Gorakh Prasad- Integral Calculus, Pothishala Pvt. Ltd. Allahabad.
3. D.A.Murray- Introductory Course in Differential Equations, Orient Longman(India) 1967.
4. मध्यप्रदेश हिंदी ग्रंथ की पुस्तके ।

REFERENCE BOOKS:

1. G.F. Simmons- Differential Equation, Tata McGraw Hill, 1972.
2. E.A.Codington- An Introduction to ordinary differential Equation, Prentice Hall of India, 1961.
3. H.T.H. Piaggio- Elementary Treatise on Differential Equations and their Application, C.B.S. Publisher & Distributors, Delhi, 1985
4. S.G.Deo - Differential Equations, Narosa Publishing House.
5. N.Piskunov - Differential and Integral Calculus, Peace Publishers, Moscow.

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Max.Marks	:	40
Class	:	BSc/B.A
Year	:	First
Subject	:	Mathematics
Paper	:	III
Title	:	**VECTOR ANALYSIS AND GEOMETRY**

UNIT – I Product of four vectors, Reciprocal vectors, vector differentiation. Gradient, divergence and curl in Cartesian and cylindrical co-ordinates, Higher order derivatives, vector identities and vector equations.

UNIT – II Vector Integration, Theorems of Gauss, Green, Stoke (without proof) and problems based on them. Application to geometry, curves in space, curvature and torsion, Serret-Frenet's formula.

UNIT – III General equation of second degree, tracing of conics, system of conics, polar equation of a conic.

UNIT – IV Equation of cone with given base, generators of cone, condition for three mutually perpendicular generators, Right circular cone, equation of cylinder and its properties.

UNIT – V Central conicoids, Paraboloid, ellipsoid, hyperboloid of one and two sheets and their properties.

BOOK RECOMMENDED :

1. N.Saran and S.N. Nigam- Introduction to Vector Analysis, Pothishala Pvt. Ltd. Allahabad.
2. Gorakh Prasad and H.C. Gupta- Text Book on Coordinate Geometry, Pothishala Pvt. Ltd. Allahabad.
3. N. Saran and R.S. Gupta- Analytical Geometry of Three Dimension, Pothishala Pvt. Ltd. Allahabad (Unit IV).

REFERENCE BOOKS:

1. R.J.T. Bell- Elementary Treatise on Coordinate Geometry of Three Dimensions, Macmillan India Ltd.,1994 (Unit- V).
2. Murray R. Spiegel- Theory and Problems of Advance Calculus, Schaum Publishing Company, New York..
3. Murray R. Spiegel- Vector Analysis, Schaum. Chand & Co., New Delhi.
4. Shanti Narayan- A Text Book of Vector Calculus, S. Chand & Co., New Delhi.
5. Shanti Narayan- A Text Book of Vector Algebra, S. Chand & Co., New Delhi.
6. S. L. Loney- The Elements of Coordinate Geometry, Macmillan and Company, London.
7. P. K. Jain and Khalil Ahmad- A Text Book of Analytical Geometry of Two Dimensions Macmillan India Ltd., 1994.
8. P. K. Jain and Khalil Ahmad- A Text Book of Analytical Geometry of Three Dimensions, Willey Eastern Ltd., 1999.