# GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE

# RAJNANDGAON (C.G.)

## SCHEME OF EXAMINATION
## &
## SYLLABUS
### *of*

## B.SC. /M.SC. (MATHEMATICS)

### UNDER
## FACULTY OF SCIENCE
### Session 2019-20
### SESSION- 2020-21

### (Approved by Board of Studies)
### Effective from July 2019

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## DEPARTMENT OF MATHEMATICS
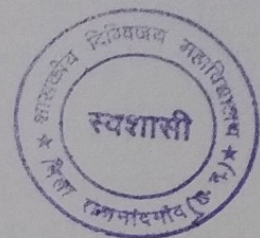
# Department of Mathematics

## List of members of Board of Studies

1. Dr. Padmavati (V.C. Nominee) –

   Govt VYT P G College Durg.CG

2. Dr. B.S. Thakur (Principal Nominee)

   PT.R S.U. Raipur.CG

3. Dr. Madhu Shrivastav (Principal Nominee) -

   Govt D B Girls P G College Raipur.CG

## Faculty Members

1. Dr. (SMT) Shabnam Khan (H.O.D.)

2. Dr. K.K. Dewangan

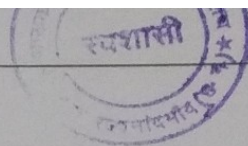3. Dr. Hemant Kumar Sao

4. Prof. Kavita Sakure

5. Prof. Vinay Masiyare

# INTRODUCTION

To meet the need and requirements of the society and order to enhance the quality and standards of education syllabus are regularly updated. B.SC. /M.SC. Mathematics programs we included core course and optional papers. The teaching program is expected to be supplemented by tutorials, seminar and PPTs.

It is recommended that each paper further divided into five units in B.SC. and four units in M.Sc. and question from each unit be asked so as to ensure the student has actually studied all the topics. In order to test the grasp of the underlining principles of the various topics, very short answer type questions, short answers and long answer type questions covering the entire syllabus will be asked. There will be theory and internal examination in B.Sc. Program with 90% Weightage of marks in Theory Exam and 10% Weightage of marks in internal Exam

# OBJECTIVE

1. A student should be able to understand the proof technique in Mathematics and its importance.
2. A student should acquire sufficient technical competence to solve the problems of varying difficulties levels.
3. A student should acquire communication skill to present technical Mathematics so as takes up career into Teaching/research in Mathematics and other various level competition exams like UPSC, PSC, etc.
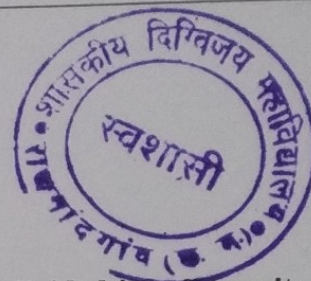
BSMTH-01

# MATHEMATICS

**There shall be three compulsory papers. Each paper of 50 Marks is divided into five units and each carry equal marks.**

## B. Sc.-I
### PAPER-I: ALGEBRA AND TRIGONOMETRY
UBMTT—101

**UNIT- I**   Elementary operations on matrices, Inverse of a matrix. Linear independence of row and column matrices, Row rank, column rank and rank of a matrix. Equivalence of column and row ranks. Eigen values, eigenvectors and the characteristic equations of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix.

**UNIT- II**   Application of matrices to a system of linear (both homogeneous and non homogeneous) equations. Theorems on consistency of a system of linear equations. Rela tion between their roots and coefficients of general polynomial equations in one variable. Transformation of equations. Descarte's rule of signs. Solutions of cubic equations (Cardons method), Biquadratic equation.

**UNIT- III**   Mappings, Equivalence relations and partitions. Congruence modulo n. Definition of a group with examples and simple properties. Subgroups, generation of groups, cyclic groups, coset decomposition, Lagrange's theorem and its consequences. Fermat's and Euler's theorems. Normal subgroups. Quotient group, Permutation groups. Even and odd permutations . The alternating groups $A_n$. Cayley's theorem.

**UNIT- IV**   Homomorphism and Isomorphism of groups. T he fundamental theorems of homomorphism. Introduction, properties and examples of rings, Subrings, Integral domain and fields , Characteristic of a ring and Field.

## TRIGONOMETRY

**UNIT- V**   De-Moivre's theorem and its applications. Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantity. Expansion of trigonometrically functions, Gregory's series. Summation of series.
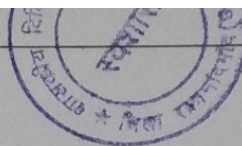
## TEXT BOOK :

1. I.N. Herstein, Topies in Algebra , Wiley Eastern Ltd., New Delhi, 1975
2. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd. New Delhi, 2000.
3. Chandrika Prasad, Text -Book on Algebra and Theory of equations, Pothishala Private Ltd., Allahabad.
4. S. L. Loney, Plane Trigonometry Part II, Macmillan and Company, London.

## REFERENCES:

1. P.B. Bhattacharya, S.K. Jain and S. R. Nagpaul, First Course in linear Algebra, Wiley Eastern, New Delhi, 1983.
2. P.B. Bhattacharya, S. K. Jain and S. R. Nagpaul, Basic Abstract Algebra (2 edition), Cambridge University Press, Indian Edition, 1997.
3. S.K. Jain, A. Gunawardena and P.B. Bhattacharya, Basic linear Algebra with MAT LAB, Key College Publishing ( Springer-Verlag), 2001.
4. H.S. Hall and S. R. Knight, Higher Algebra, H. M. Publications, 1994.
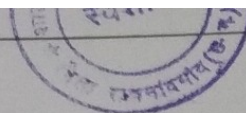5. R. S. Verma and K. S. Shukla, Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.

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# B. Sc.-I

## PAPER-II: CALCULUS

UBMTT-102

### DIFFERENTIAL CALCULUS

**UNIT- I** $\varepsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuties. Differentiability. Successive differentiation. Leibnitz theorem. Maclaurin and Taylor series expansions.

**UNIT-II** Asymptotes. Curvature. Tests for concavity and convexity. Points of inflexion. Multiple points. Tracing of curves in Cartesian and polar coordinates.

### INTEGRAL CALCULUS

**UNIT -III** Integration of transcendental functions, Reduction formulae, Definite integrals, Quadrature, Rectification, Volumes and surfaces of solids of revolution

### ORDINARY DIFFERENTIA L EQUATIONS

**UNIT- IV** Degree and order of a differential equation. Equations reducible to the linear form. Exact differential equations. First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions. Geometrical meaning of a differential equation. Ortho gonal trajectories. Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations.

**UNIT- V** Linear differential equations of second order. Transformation of the equation by changing the dependent variable/the in dependent variable. Method of variation of parameters. Ordinary simultaneous differential equations.

### TEXT BOOK

1. Gorakh Prasad, differential Calculus, Pothishala Prvate Ltd. Allahabad.
2. Gorakh Prasad, Integral Calculus, Pothishala Prvate Ltd. Allahabad.
3. D.A. Murray Introductory Course in Differential Equations. Orient Longman (India),1976

## REFERENCES

1. Gabriel Kiambeuer, Mathematical Analysis, Marcel Dekkar, Inc. New York, 1975.

2. Murray R. Spiegel, Theory and Problems of Advanced Calculus, Schaum's Outline series, Schaum's publishing Co. New York.

3. N. Piskunov, Differential and Integral Calculus, Peace Publishers, Moscow.

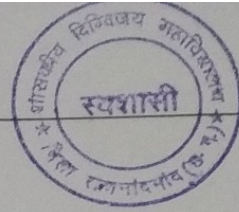4. P.k. Jain and S.K. kaushik, an introduction to Analysis, S.Chand & Co. New Delhi, 2000.

5. Gorakh Prasad, differential Calculus, Pothishala Private Ltd. Allahabad.

6. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd. Allahabad. ·

7. D.A. Murray Introductory Course in Differential Equations. Orient Longman (India),1976.

8. G.F Simmons, Differential Equations, Tata Mc Graw Hill, 1972..

9. E.A. Codington, An introduction to Ordinary Differential Equations, Preptics Hall of India,1961.

10. H.t.h Piaggio, Elemenaty Treatise on Differential Equations and their Applications, C.B.S. Publisher and Distributors, Delhi 1985

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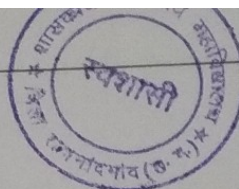
# B. Sc-I

## PAPER-III: VECTOR ANALYSIS AND GEOMETRY

UBMTT-103

**UNIT-I** Scalar and vector product of three vectors. Product of four vectors. Reciprocal Vectors. Vector differentiation. Gradient, divergence and curl.

**UNIT-II** Vector integration. Theorems of Gauss, Green, Stokes and problems based on these.

**UNIT-III** General equation of second degree. Tracing of conics. System of conics. Confocal conics. Polar equation of a conic.

**UNIT-IV** Sphere. Cone. Cylinder.

**UNIT-V** Central Conicoids. Paraboloids. Plane sections of conicoids. Generating lines. Confocal Conicoids. Reduction of second degree equations.

## TEXT BOOKS

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 Gemetry, Pothishala Pvt Ltd, Allahabad.
3. R.J.T. Bill, Elementary Treatise on Coordinate Geometry of three dimensions, Machmillan india Ltd.1994.

## REFERENCES

1. Murray R. Spiegel theory and problem of advanced calculus schaurm publishing company new York.

2. Murray R.Spiegel , vector Analysis,schaum publishing company,new York.

3. N. Saran and S.N. Nigam introduction to vector Analysis, Pothishala Pvt.Ltd,Allahabad.

4. Erwin kreysizig, advanced Engineering Mathematics, John Wiley & some 1999.

5. Shant Narayan ,A text book of vector calculus, S. chand & Co. New delhi.

6. S.L. Loney, The elements of Coordinate Geometry, Macmillan and Company, London.

7. Gorakh Ptasad and H.C. gupta, Text Book on coordinate Geometry, Pothishala pvt.Ltd, Allahabad.

8. R.J.T. Bill Elementary Treatise on coordinate Geometry of three Dimensions, Macmillan india Ltd 1994.

9. P.K. jain and Khalil Ahmad, A text book of Analysis Gemetry of two Dimensions, wley Easten Ltd, 1994.

10. P.K. jain and Khalil Ahmad, A text book of Analytical Gemetry og three Dimensions, Wiley Eastern Ltd 1999.

11. N.Saran and R.S. Gupta , Analytical Geometry of three Dimensions Pothishala Pvt.Ltd Allahabad

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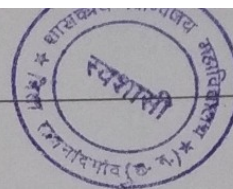
BSMTH-02

# MATHEMATICS

**There shall be three compulsory papers. Each paper of 50 Marks is divided into five units and each carry equal marks.**

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## B. Sc-II

### PAPER-I: ADVANCED CALCULUS

UBMTT-201

**Unit - I** Definition of sequence, Theorems on limits of sequence, Bounded and monotonic sequence, Cauchy's convergence criterion, series of non-negative terms. Comparison test, Cauchy's integral test, Raabe's, logarithem. DE Morgan and Bertrand's test, Alternating series, Leibinitz theorem, Absolute and conditional convergence

**Unit - II** Continuity, Sequentinal continuity, properties of continuous functions,Uniform continuity, Chain rule of diffrenentiability, Mean value theorem and their geometrical interopretation. Darboux's intermediate value theorem for derivation Taylor's theorem with various forms of remainders

**Unit - III** Limits and continuity of functions of two variables, partial differentiation change of variables, Euler's theorem on homogeneous functions, theorem for functions of two variables, Jacobians.

**Unit – IV** Envelopes, Evolutes, Maxima, minima and saddie point of functions two variables, Lagrange's multiplier metheod.

**Unit – V** Beta and Gamma function, Double and triple integrals, Dirichets integral, change of order of intergration in double integrals.

## References

1. Gabriel Klaumber, Mathematical Analysis, Marcel Dekkar, inc. New York, 1975.

2. T.M. Apostol , Mathematical Analysis, Narosa Publishing house, New Delhi, 1985.

3. R.R. Goidberg, Real Analysis, Oxford & I.B.H. publishing co. New Delhi.\, 1970.

4. D.soma sundaram and b.choudhary, A First in Mathematical Analysis, Narosa publishing H ouse, New Delhi 1997.

5. P.K.Jain and S.K.Kausic,An Introduction to Real Analysis, S. Chand and Co., New Delhi, 2000.

6. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., Allahabad.

7. Murray R. Spiegel, Theory and problems of Advanced Calculus, Schaun Publishing Co., New York.
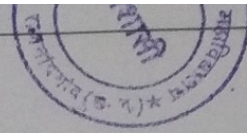
8. Gorakh Prasad, Integral Calculus, Pothishala Pvt. Ltd., Allahabad.

9. S.C.Malik, Mathematical Analysis, Wiley Eastern Ltd. New Delhi.

10. O.E. Stanaitis An Introduction to Sequences, Series and Improper Integrals, Holden – Dey, Inc. San Francisco, California.

11. Earl D. Rainville, Infinite Series, The Macmillan Company, New York.

12. Chandrika Prasad, Text Book on Algebra and Theory Of Equations, Pothishala Pvt. Ltd., Allahabad.

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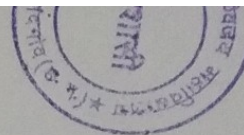
# B. Sc.-II

## PAPER-II: DIFFERENTIAL EQUATIONS

*UBMTT-202*

**UNIT – I** series salutation of differential equations, power series method, Bessel and Legendres function and their properties – convergence, recurrence and generatiing relations,Orthogonatily of function, Sturm – Liouville problem, Orthogonality of eigen – functions, Reality of Eigen value, Orthogonality of Bessal function and Legender polynomials,

**UNIT- II** Laplace Transformation – Linearity of the Laplace transforms, Laplace transforms of derivatives and integrals, Shifting theorems, Differentiation and integration of transform, Convolution theorems, solution of integral equations and systems of differential equations using the Laplace transformation.

**UNIT - III** Partial differential equations of the first order, Lagrange's solution, some special types of equations which can be solved easily by methods other than the general method, charpit's general method of solution.

**UNIT - IV** Partial differential equation of the second and higher orders, classification of linear partial differential equation of the second order, Homogeneous and non – homogeneous equations with constant coefficients, partial differential equations reducible to equation with constant coefficients, monge's methods.

**UNIT - V** Calculus of Variations – variational problems with fixed boundaries – Euler's equation for functional containing, first order derivative and one independent variable, Externals, functionals dependent on higher order derivatives, functionals dependent on more than one independent variable, variational problems in parametric form, invariance of Euler's equation undercoordinates transformations.

Variational problems with Moving Boundaries – Functionals dependent on one and two functions, one sided variation Sufficient conitions for an Extremum – Jacobi and Legendre conditions, Second Variation, Variational Principle of least action
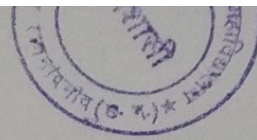
# REFERENCES

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, Inc, New York, 1999.

2. D.A. Murray, introductory course on Differential Equations, Orient Longman, (india), 1967

3. A.R. Forsyth, A Treatise on Differential Equations, Macmillan and co. Ltd. London.

4. Lan N. Sneddon, Elements of partial Differenial Equations, McGraw – Hill Book Company,1988.

5. Jane Cronin, Differential equations, Marcel Dekkar. 1994.

6. Frank Ayres, Theory and Problems of Differential Equations, McGraw Hill Book Company, 1972.

7. Richard Bronson, Theory and Problems of Differential Equations, McGraw Hill Inc., 1973.

8. A.S. Gupta, Calculus of variation with Applications, Prentice – Hall of India, 1997.

9. R. Courant and D. Hilbert, Methods of Mathematical Physics, Vots. 1 and 2, Wiley-Interscience, 1953.

10. I.M. Gelfand and S.V. Fomin, Calculus of Variation, Prentice- Hill, Englewood Ciffs, 1963.

11. A:M. Arthurs, Complementary Variation, Principles, Clarendon Press, Oxford, 1970.

12. T. Oden and J.N. Reddy, Variation Methods in Theorical Mechanics, Springer – Verlag, 1976.

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# B. Sc-II
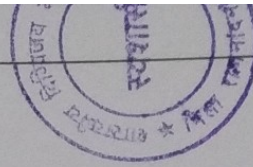
## PAPER-III: MECHANICS

UBMTT-203

**STATICS**

**UNIT - I**  Analytical conditions of Equilibrium, Stable and unstable equilibirm, Virtual work, Catenary

**UNIT - II**  Forces in three dimensions, Poinsot's central axis, Null lines and palnes, Dynamics,

**UNIT - III**  Simple harmonic motion, Elastic strings, velocities and accelerations along radial and transverse direction, projectile, central orbits

**UNIT – IV**  Kepler's laws of motion, velocities and acceleration in tangential and normal directions, motion on smooth and plane curves.

**UNIT - V**  Motion a resisting medium, of particles of vaeying mass, motion of particle in three dimensions, acceleration in terms of different co-ordinate systems.

## REFERENCES

1. S.L. Loney, statics, Macmillan and Company, London.
2. R.S. Verma A Text Book on statics, Pothidhala Pvt. Ltd., Allahabad.
3. S.L. Loney, An Elementary Treatise on the Dynamics of a particle rigid bodies, Cambridge University Press,1956

BSMTH-03

# MATHEMATICS

**There shall be three theory papers. Two compulsory and one optional each paper carrying 50 marks is divided into five units and each unit carry equal marks**

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## B. Sc-III

### PAPER-I: ANALYSIS
UBMITT-301

**REAL ANALYSIS**

**UNIT-I** Series of arbitrary terms, Convergence, divergence and Oscillation. Abel's and Dirichlet's test. Multiplication of series, Double series, Partial derivation and differentiability of real-valued function of two variables. Schwarz and young's theorem, implicit function theorem Fourier series. Fourier expansion of piecewise monotonic function

**UNIT-II** Riemann integral, Intergrability of piecewise monotonic function. The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Improper integrals and their convergence, comparison tests. Abel's and Dirichlet's tests. Frullani's integral. Integral as a function of a parameter,Continuity, derivability and integrability of an integral of a function of a parameter.

**COMPLEX ANALYSIS**

**UNIT-III** Complex numbers as ordered pairs, Geometric representation of complex numbers, Stereographic projection.continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations, Harmonic functions, Elementary functions, Mapping by elementary functions, Mobius transformations, Fixed points, cross ratio. Inverse points and critical mappings, Conformal mappings
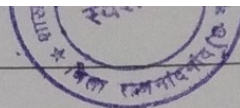
## METRIC SPACES

**UNIT-IV** Definition and examples of metric spaces. Neighborhoods, Limit points, Interior points, Open and closed sets, Closure and interior. Boundary points, Sub-space of a metric space. Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, Construction of real numbers as the completion of the incomplete cetric space of rationals, Real numbers as a complete ordered field

**UNIT-V** Dense subsets, Baire Category theorm, Separable, second countable and first countable spaces, Continuous functions. Extension theorem, Compactness, Sequential compactness, Totally bounded spaces Finite intersection property. Contiuous functions and compact sets, Connectedness, Continuous functions and connected sets

### REFERENCES:

1. T.M. Apostol, Mathematical Analysis, Publishing House, New Delhi, 1985.
2. R.R Goldberg, Real Analysis, Oxford & IBH publishing Co., New Delhi, 1970.
3. S. Lang, Undergraduate Analysis, Springer-Verlag, New York, 1983.
4. D. Somasundaram and B. Choudhary, A First Coarse in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
5. Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.
6. P.K. Jain and S.K. Kaushilk, An introduction to Real Analysis, S. Chand & Co., New Delhi, 2000.
7. R.V. Churchill & J.W. Brown, Complex Variables: Introduction and Applications, 5*" Edition, McGraw-Hill, NewYork, 1990
8. MarkJ. Ablowitz & A.S. Fokas, Complex VariableCo., Introduction and Applications, Cambridge University Press, South Asian Edition, 1998.
9. Shanti Narayan, Theory of Functions of a Complex Variable, S. Chand & Co., New Delhi.
10. E.t. Copson, Metric Spaces, Cambridge University Press, 1968.
11. P.K. Jain and K. Ahmad, Metric Spaces, Narosa Publishing House, New Delhi, 1996.

12. G.F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 1963.

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# B. Sc-III

## PAPER-II: ABSTRACT ALGEBRA

*CB UBMITT -302*

**UNIT-1 Group**-Automorphisms, inner automorphism. Automorphism groups and their computations, Conjugacy relation, Normaliser, Counting principle and the class equation of a finite group, Center for Group lf prime-order, Abelianizing of a group and its universal property. Sylow's theorems, Sylow subgroup, Structure theorem for finite Abelian groups

**UNIT-II  Ring theory**-Ring homomorphism, Ideals and Quotient Rings. Field of Quotients of an Integral Domain, Euclidean Rings, Polynomial Rings, Polynomials over the Rational Field. The Eisenstien Criterion, Polynomial Rings over Commutative Rings, Unique factorization domain. Ṙ unique factorization domain implies so is R [ x1, x2------xn] Modules, Submodules, Quotient modules, Homomorphism and Isomorphism theorems.

**UNIT-III Vector spaces**- Definition and examples of vector spaces, Subspaces. Sum and direct sum of subspaces, Linear span. Linear dependence, independence and their basic properties, Basis. Finite dimensional vector spaces, Existence theoremfor bases. Invariance of subspace of a subspace of a finite dimensional vector space, Dimension of sums of subspaces. Quotient space and its dimension

**UNIT-IV Linear transformations**- Linear transformations and their representation as matrices The Algebra of linear transformations. The rank nullity theorem. Change of basis. Dual space, Bidual space and natural isomorphism. Adjoint of a linear transformation. Eigenvalues and eigenvectors of a linear transformation. Diagonalisation. Annihilator of a subspace. Bilinear, Quadratic and Hermitian forms.

**UNIT-V  Inner Product Spaces**-Cauchy-Schwarz inequality. Orthogonal vectors. Orthogonal Complements, Orthonormal sets and bases. Bessel's inequality for finite dimensional spaces. Gram-Schmidt Orthogonalization process.
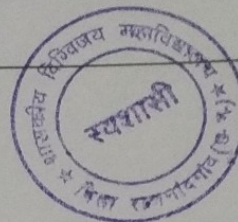
## REFERENCES

1. I.N. Herstein, Topics in Algebra, Wiley Eastern Ltd., New Delhi, 1975.
2. N. Jacobson, Basic Algebra, Vols. I & II.W.H Freeman, 1980 (also published by Hindustan Publishing Company).
3. Shanti Narayan, A Text Book of Modern Abstract Algebra, S.Chand & Co. New Delhi.
4. K.B. Datta, Matrix and Linear Algebra, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
5. P.B. Bhattacharya, S.K. Jain and S.R. Nagpal, Basic Abstract Algebra (2" Edition) Cambridge University Press, Indian Edition, 1997.
6. K. Hoffman and R. Kunze, Linear Algebra, 2" " Edition, Prentice Hall. Englewood Cliffs, New Jersey, 1971.
7. S.K Jain,A Gunawardena & P.B. Bhattacharya,Basic Linear Algebra With MATLAB. Key College Publishing (Springer-Verlag) 2001.
8. S.Kumaresan, Linear Algebra, A.Geometric Approch,Prentice-hall of india,2000.
9. Vivek Sahai and Vikas Bist,Algebra,Narosa Publishing House.1997.
10. I.s.Luther and I.B. passi,Algerba, Vol. I-Group, Vol. II –Rings. Narosa Publishing House (Vol.-1-1996,vol.II-1999)

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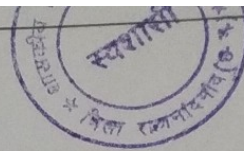
# B. Sc-III

## PAPER II: (I) PRINCIPLES OF COMPUTER SCIENCE (OPTIONAL)

UBMIET-303

**UNIT-I** Data Storage- Storage of bits. Main Memory. Mass Storage. Coding Information of Storage. The Binary System. Storing integers, Storing fraction, communication errors. Data Manipulation- The Central Processing Unit. The Stored-Program Concept. Programme Execution. Other Architectures. Arithmetic/Logic Instruction. Computer- Peripheral Communication.

**UNIT-II** Operating System and Networks – The Evolution of Operating System. Operating System Architecture. Coordinating the Machine's Activities. Handling Competition Among Process. Networks. Networks Protocol.

Software Engineering – The Software Engineering Discipline. The Software Life Cycle. Modularity. Development Tools and Techniques. Documentation, Software Ownership and Liability.

**UNIT-III** Algorithms- The Concept of an Algorithm, Algorithm Representation. Algorithm Discovery. Iterative Structures. Recursive Structures. Efficiency and Correctness. (Algorithms to be implemented in $C^{++}$).

Programming Language- Historical Perspective. Traditional Programming Concepts, Program Units. Language Implementation. Parallel Computing, Declearative Computing.

**UNIT-IV** Data Structures- Arrays, Lists, Stacks, Queues, Tree. Customised Data Types. Object Oriented Programming.File Structure- Sequential Files. Text Files, Indexed Files. Hashed Files. The Role of The Operating System.Database Structure- General Issues, The Layered Approach to Database Implementation. The Relational Model, Object- Oriented Database. Maintaining Database Integrity, E-R models.

**UNIT-V** Artificial Intelligence – Some Philosophical Issues, Image Analysis, Reasoning, Control System Activities, Using Heuristics, Artificial Networks. Application of Artificial Intelligence

Theory of Computation- Turning Machines, Computable function, A Non computable Function. Complexity and its Measures, Problem Classification

## REFERENCES

1. J. Glen Brookshear, computer Science : An Overview, Addition – Wesley.

2. Stanley B. Lippman, Josee Lojoie, $C^{++}$ Primer (3rd Edition), Addison – Wesley
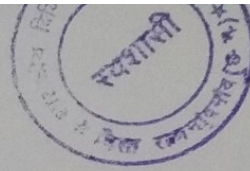
# B. Sc-III

## PAPER-II: (II) DISCRETE MATHEMATICS (OPTIONAL)

UBMET—304

**UNIT- I** Sets and propositions- Cardinality, Mathematical Induction, Principle of Inclusion and exclusion, Computability and formal Languages – Ordered Sets, Languages, Phrase Structure Grammars. Types of Grammars and Languages, Permutations, Combinations and Discrete Probability

**UNIT-II** Relation and Function - Binary Relation, Equivalence Relation and Partition, Partial Order Relation and Lattice.Chain and Antichains, Pigeon Hole Principle. Graphs and Planner Graphs, Basic Terminology, Multigraphs. Weighted Graphs.Path and Circuits.Shotest paths. Eulerian Paths and Circuits, Travelling Salesman Problem, Planner Graphs

**TREES**

**UNIT-III** Finite State Machine – Equivalent Machines, Finite State Machines as Language Recognizers, Analysis of Algorithms – Time complexity, Complexity of Problems, Discrete Numeric Function and Generating Functions.

**UNIT-IV** Recurrence Relation and Recursive Algorithms- Linear Recurrence Relation with constant coefficitients, Homogeneous solution. Particular solution, Total solution. by the method of Generating Functions, Briel review of Groups and Rings

**UNIT-V** Boolean Algebras- Lattices and Algebraic Structures, Duality, Distributive and Complemented Lattices and Boolean Algerba. Boolean Function and Expressions, Prepositional Calculus, Design and Implementation of Digital networks Switching Circuits.

**REFERENCES**

C.L. Liu, Elements of Discrete Mathematics, (second Edition), McGraw Hill, International Edition, Computer science series, 1986

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23/7/19

## B. Sc-III

## PAPER III: APPLICATION OF MATHEMATICS IN FINANCE AND INSURANCE (OPTIONAL)

UBmET-305

### Application of Mathematics in Finance

**UNIT I**- Financial Management- An overview. Nature and scope of Financial Management. Goals of Financial Management and main decisions of Financial Management. Difference between risk , speculation and gambling.Time Value of money-interest rate and discount rate. Present value and future value discrete case as well as continuous compounding case. Annuities and its kinds.

**UNIT II**- Meaning of return. Return as internal rate of return(IRR). Numerical methods like Newton Ramphson Method to calculate  IRR. Measurement of returns under uncertainty situations. Meaning of risk. Difference between risk and uncertainty. Types of risks. Measurement of risk. Calculation of security and portfolio Risk and Return-Markowitz Model. Sharpe's Single Index Model Systematic Risk and Unsystematic risk.

**UNIT III**-Taylor series and Bond Valuation. Calculation of duration and Convexity of bonds. Financial derivatives- Futures. Forward. Swaps and Options. Call and put Option. Call and put parity theorem. Pricing of contingent claims through Arbitrage and Arbitrage theorem.

### Application of Mathematics in Insurance

**UNIT IV**- Insurance Fundamentals- Insurance defined. Meaning of loss. Chances of loss, peril ,hazard, and proximate cause in insurance. Costs and benefits of insurance to the society and branches of insurance-life insurance and various types of general insurance, Insurable loss expenditures of a loss that is ideal for insurance. Life insurance Mathematics- construction of Mortality Tables. Computation of Premium of Life Insurance for a Fixed Duration and for the whole life.

**UNIT V-** Determination of claims for General Insurance- Using Poisson Distribution and negative Binomial Distribution- the Poyla Case.

Determination of the amount of claims in General Insurance- Compound Aggregate claim model and its properties, claims of reinsurance. Calculation of a compound claim density function. F-recursive and approximate formulae for F

## REFERENCES

1. Aswath Damodaran, Corporate Finance- Theory and Practice, John Wiley & sons Inc.
2. John C. Hull Options, Futures, and Other Derivatives, Prentice-Hall of Indian Private Limited:
3. Sheldon M. ross,An Introduction to Mathematical Finance, Cambridge University Press.
4. Marks S. Dorfman, Introduction to Risk Management and insurance, Prentice Hall, Englwood Cliffs, New Jeresy.
5. C.D. Daykin, T.Penitikainen and M. Pesonen, Practical Risk Theory for Actuaries, Chapman & Hall

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## B. Sc-III

## PAPER III: (V) MATHEMATICAL MODELING (OPTIONAL)

UBMGT- 306

### The Process of Applied Mathematics

**UNIT I-** Setting up first order differential equations-Qualitative solution sketching, Difference and Differential equation growth models

**UNIT II** -Single-species population models, Population growth- An age structure model. The spread of Technological innovation

**UNIT III-**Higher order Linear models- A model for the detection of the diabetes. Combat modes. Traffic models- car following models

Equilibrium speed distributions.

**UNIT IV-** Non-Linear population growth models, Models from political science-Proportional representation - Cumulative voting, comparison voting.

**UNIT V-** Applications in Ecological and Environmental subject areas- Urban waste water management planning.

### REFERENCES -

1. Differential equation models, Eds. Martin Braun, C.S. Coleman, D>A. Drew.

2. POLITICAL AND Related Models, Steven . J. Brams, W.F Lucas, P.D. Straftin (Eds.)

3. Discrete and System models, W.F. Lucas, F.S Roberts, R.M Thrall.

4. Life Science Models, H.M Roberts & M. Thompson.

   All Volumes published as modules in applied Mathematics, Springer-Verlag,1982.

5. Mathematical modeling by J.N. Kapur, New Age International, New Delhi.

# B.SC. III

# PROGRAMMING IN C AND NUMERICAL ANALYSIS

## (Theory & Practical) (OPTIONAL)

UBMET-307　　　　Maximum marks (30 +20)

**UNIT-I** Programmer's model of a computer. Algorithms. Flow Charts. Data Types. Arithmetic and input/output instructions. Decisions control structures. Decision statements. Logical and Conditional operators. Loop. Case control structures. Functions. Recursions. Preprocessors. Arrays. Puppetting of strings. Structures. Pointers. File formatting.

**Numerical Analysis**

**UNIT-II** Solution of Equations : Bisection, Secant, Regula Falsi, Newton's Method, Roots of Polynomials : Interpolation : Lagrange and Hermite Interpolation, Divided Differences, Difference Schemes, Interpolation Formulasusing Differences. Numerical Differentiation. Numerical Quadrature : Newton-Cote's Formulas. Gauss Quadrature Formulas, Chebychev's Formulas.

**UNIT-III** Linear Equations : Direct Methods for Solving. Systems of Linear Equations (Guass Elimination, LU Decomposition, Cholesky Decomposition), Iterative Methods (Jacobi, GaussSeidel, Relaxation Methods).

The Algebraic Eigenvalue problem : Jacobi's Method, Givens' Method, Householder's Method, Power Method, QR Method, Lanezos' Method.

**UNIT-IV** Ordinary Differential Equations : Euler Method, Single-step Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method, Methods Based on Numerical Integration, Methods Based on Numerical Differentiation, Boundary Value Problems, Eigenvalue Problems.

Approximation : Different Types of Approximation, Least Square Polynomial Approximation, Polynomial Approximation using Orthogonal Polynomials, Approximation with Trigonometric Functions, Exponential Functions, Chebychev Polynomials, Rational Functions.

**Unit-V** Monte Carlo Methods Random number generation, congruential generators, statistical tests of pseudo-random numbers. Random variate generation, inverse tranform method, composition method, acceptancerejection method, generation of exponential, normal variates, binomial and Poisson variates.
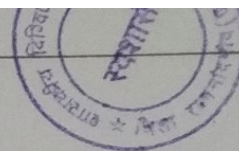
Monte Carlo integration hit or miss Monte Carlo integration, Monte Carlo integration for improper integrals, error analysis for Monte Carlo integrations.

## REFERENCES

1. Henry Mullish& Herbert L. Cooper, Spirit of C : An Introductionto Modern Programming, Jaico Publishers, Bombay.

2. B.W. Kernighan and D.M. Ritchie. The C Programming Language 2"d Edition, (ANSI features) Prentice Hall, 1989.

3. Peter A Darnel and Philip E. Margolis, C : A Software Engineering Approach, Narosa Publishing House, 1993.

4. Robert C. Hutehisonand Steven B. Just, Programming using C Language, McGraw Hill, 1988.

5. Les Hancock and Morris Krieger, The C Primer, McGraw Hill, 1988.
6. V. Rajaraman, Programming in C, Prentice Hall of India, 1994.
Byron S. Gottfried, Theory and Problems of Programming with C, tata McGraw-Hill Publishing Co. Ltd., 1998.

8. C.E. Froberg,Introduction to Numerical Analysis, (Second Edition), Addison-Wesley, 1979.

9. James B. Scarborough, Numerical Mathematical Anasysis, Oxford and IBHPublishing Co. Pvt. Ltd. 1966.

10. Melvin J. Maron, Numerical Analysis A Practical Approach, Macmillan publishing Co., Inc. New York, 1982.

11. M.K. Jain, 'S.R.K. lyengar, R.K. Jain, Numerical Methods Problems and Solutions, New Age International (P) Ltd., 1996.

12. M.K. Jain, S.R.K. lyengar, R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International (P) Ltd., 1999.

13. R.Y. Rubistein, Simulation and the Monte Carlo Methods, John Wiley, 1981.

14. D.J. Yakowitz Computational Probability and Simulation, Addison-Wesley, 1977

# B.COM PART III
## OPTIONAL GROUP B(Marketing Area)
### TITLE OF PAPER -PRINCIPLES OF MARKETING
PAPER – I
**Proposed syllabus**

2020-21

## OBJECTIVE

The Objective of this course is to help students to understand the concept of marketing and its applications.

M.M. 75

**UNIT-I** Introduction : Nature and scope of marketing; Importnace of marketing as a businessfunction, and in the economy; Marketing concepts - traditional and modern; Sellingvs. marketing; Marketing mix; Marketing environment.

**UNIT-II** Consumer Behaviour and Market Segmentation : Nature, scope, and significance ofconsumer behaviour; Market segmentation - concept and importance; Bases for market segmentation.

**UNIT-III** Product : Concept of product, consumer, and industrial goods; Product planning anddevelopment; Packaging role and functions; Brand name and trade mark; after salesservice; Product life cycle concept. Price : Importance of price in the marketing mix; Factors affecting price of a product/service; Discounts and rebates.

**UNIT-IV** Distributions Channels and Physical Distribution; Distribution channels - Concept androle; Types of distribution channels. Factors affecting choice of a distribution channel;

Retailer and holesaler; Physical distribution of goods; Transportation, Warehousing, Inverntory control; Order processing.

**UNIT-V** Promotion : Methods of promotion; Optimum promotion mix; Advertising media – theirralative merits and limitations; Characteristics of an effective advertisement; Personalselling; Selling as a career; Classification of successful sales person; Functions ofsalesman.

Recent development in marketing –social marketing, online marketing, Direct marketing , Services marketing, Green marketing.

UCOMT 306

# B.COM PART III
# OPTIONAL GROUP B(Marketing Area)
## TITLE OF PAPER -INTERNATIONAL MARKETING
### PAPER – II
### Proposed syllabus

201021

**OBJECTIVE**

This course aims at acquainting student with the operations of marketing in internation alenvironment.

M.M. 75

**UNIT-I**    International Marketing : Nature, definiton, and scope of international marketing;
Domestic marketing vs. International marketing; International environment externaland internal.

**UNIT-II**    dentifying and Selecting Foreign Market: Foreign market entry mode decisions. Product Planning for international Market: Product designing; Standardization vs.adaptation; Branding and packaging; Labeling and quality issues; After sales service.International Pricing: Factors Influenceing International price; Pricing process-processand methods; International price quotation and payment terms.

**UNIT-III**    Promotion of Product/Services Abroad: Methods of international promotion; Direct mail and sales literature; Advertising; Personal selling; Trade fairs and exhibitions.

**UNIT-IV**    International Distribution: Distribution channels and logistics decisions; Selection and appointment of foreign sales agents.

**UNIT-V**    .Export Policy and Practices in India: Exim policy - an overview; Trends in India'sforeign trade; Steps in starting an export business; Product selection; Market
selection; Export pricing; Export finance; Documentation; Export procedures; Export
assistance and incentives.
Marketing Control Process

# B.COM PART III
## OPTIONAL GROUP B(Marketing Area)
### TITLE OF PAPER -INTERNATIONAL MARKETING
PAPER – II
#### Proposed syllabus

201021

**OBJECTIVE**

This course aims at acquainting student with the operations of marketing in internation alenvironment.

M.M. 75

**UNIT-I**  International Marketing : Nature, definiton, and scope of international marketing;
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**UNIT-III**  Promotion of Product/Services Abroad: Methods of international promotion; Direct mail and sales literature; Advertising; Personal selling; Trade fairs and exhibitions.

**UNIT-IV**  International Distribution: Distribution channels and logistics decisions; Selection and appointment of foreign sales agents.

**UNIT-V**  .Export Policy and Practices in India: Exim policy - an overview; Trends in India'sforeign trade; Steps in starting an export business; Product selection; Market
selection; Export pricing; Export finance; Documentation; Export procedures; Export
assistance and incentives.
Marketing Control Process

# M.SC. MATHEMATICS

## Semester System, 2019-20 Onwards
2020-21

There shall be five papers (Theory/Practical) in M.Sc. Mathematics Course (Third & Fourth semester) Mathematics in each Semester. All are compulsory. Each paper Will have 100 (80 Theory+20 Internal Assessment) Marks. Overall marks in Theory and Practical in each semester will be 500. The course content of each paper has been divided into four units. However, there will be internal choice in each Unit.

### First Semester

| Course Marks | Subject | Theory | Int.Ass. | Max |
|---|---|---|---|---|
| Paper-I | Advanced Abstract Algebra (I) | 80 | 20 | 100 |
| Paper-II | Real Analysis (I) | 80 | 20 | 100 |
| Paper-III | Topology (I) | 80 | 20 | 100 |
| Paper-IV | Complex Analysis (I) | 80 | 20 | 100 |
| Paper-V | Advanced Discrete Mathematics (I) | 80 | 20 | 100 |

**DEPARTMENT OF MATHEMATICS**
*Govt Digvijay Autonomous PG College Rajnandgaon,C G*
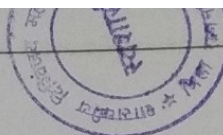
## Second Semester

| Course | Subject | Theory | IntAss. | Max Marks |
|---|---|---|---|---|
| Paper-I | Advanced Abstract Algebra (II) | 80 | 20 | 100 |
| Paper-II | Real Analysis (II) | 80 | 20 | 100 |
| Paper-III | General and Algebraic Topology (II) | 80 | 20 | 100 |
| Paper-IV | Complex Analysis (II) | 80 | 20 | 100 |
| Paper-V | Advanced Discrete Mathematics (II) | 80 | 20 | 100 |

## Third Semester

| Course | Subject | Theory | Practical | Int,.Ass. | Max Marks |
|---|---|---|---|---|---|
| Paper I | Integration Theory and Functional Analysis (I) | 80 | - | 20 | 100 |
| Paper-II | Partial Differential Equations | 80 | - | 20 | 100 |
| Paper-III | Programming in C (ANSI features) Theory and Practical (I) | 50 | 30 | 20 | 100 |
| Paper-IV | Operations Research (I) | 80 | - | 20 | 100 |
| Paper-V | Optional -1 | | | | |
| | Fuzzy Sets and Its Applications (I) | 80 | - | 20 | 100 |
| | Optional -2 | | | | |
| | Fundamental of Computer Science | | | | |
| | Theory & Practical | 50 | 30 | 20 | 100 |
| | (Object oriented programming and Data structure) | | | | |
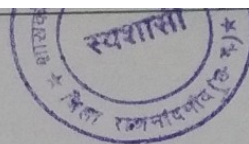
# Fourth Semester

| Course | Subject | Theory | Practical | Int.Ass. | Max Marks |
|---|---|---|---|---|---|
| Paper-I | Functional Analysis (II) | 80 | - | 20 | 100 |
| Paper-II | Mechanics | 80 | - | 20 | 100 |
| Paper-III | Programming in C (ANSI features) Theory and Practical (II) | 50 | 30 | 20 | 100 |
| Paper-IV | Operations Research (II) | 80 | - | 20 | 100 |
| Paper-V | Optional -1 | | | | |
| | FuzzySets and Its Applications (II) | 80 | - | 20 | 100 |
| | Optional -2 | | | | |
| Operating System data base Management System | | | | | |
| | Theory & Practical | 50 | 30 | 20 | 100 |

## CREDIT BASED SYSTEM (CBS)

At post-graduate level, candidates are required to study twenty papers in I$^{st}$, II$^{nd}$, III$^{rd}$ and IV$^{th}$ Semester Examination (5-papers in each semester). This is treated as twenty papers course structure. So there will be twenty papers in each POST-GRADUATE EXAMINATION in MATHEMATICS containing 100 credits. In first and second semester, each paper shall carry 100 marks (80 marks for external examination and 20 marks for internal examination). In Third and Fourth semester, Third paper (Programming in C) and Fifth(Optional Theory and Practical)) paper will carry 50 marks for External Examination and 20 marks for Internal Examination and 30 marks for Practical Examination. There shall be 2000 marks in M.Sc. Candidates shall have to secure 36 percent marks in aggregate of all papers in order to pass the M.Sc. Examination.

## M.Sc. SEMESTER – I

| Paper | Title Of The Paper | Credits |
|---|---|---|
| PAPER-I | Advanced Abstract Algebra(I) | 05 |
| PAPER-II | Real Analysis(I) | 05 |
| PAPER -III | Topology(I) | 05 |
| PAPER-IV | Complex Analysis(I) | 05 |
| PAPER-V | Advanced Discrete Mathematics(I) | 05 |
| | Total Credits | 25 |

## M.Sc. SEMESTER – II

| Paper | Title Of The Paper | Credits |
|---|---|---|
| PAPER-I | Advanced Abstract Algebra(II) | 05 |
| PAPER-II | Real Analysis(II) | 05 |
| PAPER -III | General and Algebraic Topology (II) | 05 |
| PAPER-IV | Complex Analysis(II) | 05 |
| PAPER-V | Advanced Discrete Mathematics(II) | 05 |
| | Total Credits | 25 |

23/7/19

# M.Sc. Mathematics (Third Semester) 2020-21

## Paper- III: PROGRAMMING IN C (WITH ANSI FEATURES)

## THEORY AND PRACTICAL

Max Marks. 50

**Unit-I**    An Overview of Programming, Programming language, Classification, C Essentials-Program Development, Functions. Anatomy of a C Function. Variables and Constant, Expressions, Assignment Statements. Formatting Source Files. Continuation Character. The Preprocessor

**Unit-II**    Scalar Data Types-Declarations, Different Types of Integers. Different Kinds of Integer Constants. Floation-Point Types. Initialization. Mixing Types. Explicit Conversions-Casts. Enumeration Types. The Void Data Type. Typedefs. Finding The Address of an Object. Ponters.

**Unit-III**    Control Flow-Conditional Branching. The Switch Statement. Looping. Nested Loops. The break and Continue Statements. The goto statement. Infinite Loops. Arrays-Declaring an Array. Arrays and Memory. Initializing Arrays. Encryption and Decryption.

**Unit-IV**    Operators and Expressions-Precedence and Associativity. Unary Plus and Minus operators, Increment and Decrement Operators, Comma Operator, Relational Operator. Logical Operator. Bit-Manipulation Operator, Bitwise Assignment Operators. Cast Operator. Size of Operators. Conditional Operator. Memory Operators

**Internal Assessment: 20**

**References**

1. Peter A. Darnell and Philip E. Margolis, C: A Software Engineering Approach, Narosa Publishing House (Springer International Student Edition) 1993.
2. Samuel P. Harkison and Gly L. Steels Jr., C: A Reference Manual, 2nd Edition, Prentice Hall, 1984.
3. Brian W, Kernighan & Dennis M. Ritohie, The C Programme Language. 2nd Edition (ANSI Features), Prentice Hall 1989.

# M.Sc. Mathematics (Third Semester) 2020-21

## Paper- III: PROGRAMMING IN C (WITH ANSI FEATURES)

## THEORY AND PRACTICAL

**Max Marks. 50**

**Unit-I** An Overview of Programming, Programming language, Classification, C Essentials-Program Development, Functions. Anatomy of a C Function. Variables and Constant, Expressions, Assignment Statements. Formatting Source Files. Continuation Character.The Preprocessor

**Unit-II** Scalar Data Types-Declarations, Different Types of Integers. Different Kinds of Integer Constants. Floation-Point Types. Initialization. Mixing Types. Explicit Conversions-Casts. Enumeration Types. The Void Data Type. Typedefs. Finding The Address of an Object. Ponters.

**Unit-III** Control Flow-Conditional Branching. The Switch Statement. Looping. Nested Loops. The break and Continue Statements. The goto statement. Infinite Loops. Arrays-Declaring an Array. Arrays and Memory. Initializing Arrays. Encryption and Decryption.

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**Internal Assessment: 20**

**References**

1 Peter A. Darnell and Philip E. Margolis, C: A Software Engineering Approach, Narosa Publishing House (Springer International Student Edition) 1993.
2 Samuel P. Harkison and Gly L. Steels Jr., C: A Reference Manual, 2nd Edition, Prentice Hall, 1984.
3 Brian W, Kernighan & Dennis M. Ritohie, The C Programme Language. 2nd Edition (ANSI Features), Prentice Hall 1989.

# M.Sc. Mathematics (Third Semester) 20 20-21

## PAPER-V (Optional-1)
## FUZZY SETS AND ITS APPLICATIONS (I)

**Max Marks. 80**

**Unit-I**    Fuzzy Sets, basic definitions, alpha-level sets, convex fuzzy sets, Basic operations On fuzzy sets, Cartesian product, Algebraic products, bounded sum and difference ,t-norms and t-conorms.

**Unit-II**    Extension Principle- the Zadeh's extension principle, Image and inverse image of fuzzy sets, Fuzzy numbers. Elements of fuzzy arithmetic

**Unit-III**    Fuzzy relations and fuzzy graphs- Fuzzy relations on fuzzy sets, composition Of fuzzy relations, min-max composition and its properties, fuzzy equivalence relations, fuzzy compatibility relations, fuzzy relation equations, fuzzy graphs, similarity relation

**Unit IV**    Possibility Theory, Fuzzy measure, evidence theory necessity measure, possibility measure, possibility distribution, possibility theory and fuzzy sets, Possibility theory versus probability theory

**Internal Assessment: 20**

### References

H.J.Zmmemann. Fuzzy Set theory and its Applications. Allied Publishers Ltd. New Delhi 1991.

G.J. Klir and B.Yuan, Fuzzy Sets and Fuzzy logic. Prentice-Hall of India,New Delhi.1995

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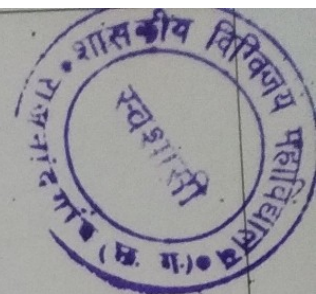
# M.Sc. Mathematics (Third Semester) 2020-21

## PAPER-V (Optional-2)
## FUNDAMENTALS OF COMPUTER SCIENCE
## THEORY AND PRACTICAL
## (OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURE)

**Max. Marks. 100 (Theory-50 +Practical-30+Internal -20)**

**Unit-I** Object Oriented Programming-Classes and Scope, nested classes, pointer class members;

Class initialization, assignment and destruction.

**Unit-II** Overloaded functions and operators; Templates including class templates; class

inheritance and virtual functions.

**Unit-III** Data Structures-Analysis of algorithms, q, W, 0, o, w notations; Sequential and linked

representations, Lists, Stacks, and queues;

**Unit-IV** Trees: Binary tree- search tree implementation, B-tree (concept only);

Sorting: Insertion sort, shell sort, quick-sort, heap sort and their analysis;

Hashing-open and closed.

**Books Recommended:**

1. S. B. Lipman, J. Lajoi: C++ Primer, Addison Wesley.
2. B. Stroustrup; The C++ Programming Language, Addison Wesley.
3. C. J. Date : Introduction to Database Systems, Addison Wesley.
4. C. Ritehie: Operating Systems-Incorporating UNIX and Windows, BPB Publications.
5. M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley

**Practical Examination Scheme**
Max. Marks – 30 Time Duration – 3 Hrs.
Practical (two) 20 Marks (10 marks each)
Viva 05 Marks
Sessional 05 Marks

# M.Sc. Mathematics (Fourth Semester) 2020-21

## PAPER-V (Optional-1)
## FUZZY SETS AND ITS APPLICATIONS (II)

**Max Marks. 80**

**Unit-I**    Fuzzy Logic-An overview of classical logic, Multivalued logics, Fuzzy propositions. Fuzzy quantifiers. Linguistic variables and hedges. Inference from conditional fuzzy propositions, the compositional rule of inference

**Unit-II**    Approximate Reasoning-An overview of Fuzzy expert system. Fuzzy implications and their selection. Multiconditional approximate reasoning. The role of fuzzy relation equation

**Unit-III**    An introduction to Fuzzy Control-Fuzzy controllers. Fuzzy rule base. Fuzzy inference engine. Fuzzification.Defuzzification and the various defuzzitication methods (the centre of area, the centre of maxima, and the mean of maxima methods)

**Unit IV**    Decision Making in Fuzzy Environment-Individual decision making. Multiperson decision making. Multicriteria decision making. Multistage decision making. Fuzzy ranking methods. Fuzzy linear programming

**Internal Assessment: 20**

### References

1. H.J. Zmmemann, Fuzzy set theory and its Applications, Allied Publishers Ltd. New Delhi, 1991.
2. G.J. Klir and B. Yuan- Fuzzy sets and fuzzy logic, Prentice-Hall ol India, New Delhi, 1995.

# M.Sc. Mathematics (Fourth Semester) 2020-21

## PAPER-V (Optional-2)
## OPERATING SYSTEM AND DATABASE MANAGEMENT SYSTEM
## THEORY AND PRACTICAL

### Max. Marks. 100 (Theory-50 +Practical-30+Internal -20)

**Unit-I** Database Systems-Role of database systems, database system architecture and data modelling

**Unit-II Introduction** to relational algebra and relational calculus

**Unit-III** Introduction to SQL: Basic features including views; Integrity constraints; Database design-normalization up to BCNF.

**Unit-IV** Operating Systems- Overview of operating system, user interface, processor management, memory management. I/O management, concurrency and Security, network and distributed systems

**Books Recommended:**
1. S. B. Lipman, J. Lajoi: C++ Primer, Addison Wesley.
2. B. Stroustrup; The C++ Programming Language, Addison Wesley.
3. C. J. Date: Introduction to Database Systems, Addison Wesley.
4. C. Ritehie: Operating Systems-Incorporating UNIX and Windows, BPB Publications.
5. M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley

**Practical Examination Scheme**
Max. Marks – 30 Time Duration – 3 Hrs.
Practical (two) 20 Marks (10 marks each)
Viva 05 Marks
Sessional -05 Marks

BSPHY-01

## M.Sc. Physics[1&2 Semester]
### Year 2020-2021

The syllabus will consist of four theory paper and two practicable laboratory course in each semester wise course structure along with distribution of marks as follows:

OBJECTIVES:-

The benefits of career-oriented course can be extended to regular students. Education plays very vital in each and every person's life. The aim of college is to bring the quality education to the student in every aspect of life with view and looking at the future and of the M.Sc. in Physics.

### Semester-I

| | | |
|---|---|---|
| Paper-1: | Mathematical Physics | [80 Marks ] |
| Paper-2: | Classical Mechanics | [ 80 Marks ] |
| Paper-3: | Electrodynamics & Plasma Physics | [ 80 Marks ] |
| Paper-4: | Electronic & Photonic Device Optical Modulation | [ 80 Marks ] |
| * Internal assesment in each paper | | [ 20 Marks ] |
| * Laboratory Course I-A | | [ 100 Marks ] |
| *Laboratory Course I-B | | [ 100 Marks ] |

### Semester-II

| | | |
|---|---|---|
| Paper-1: | Quantum Mechanics-I | [ 80 Marks ] |
| Paper-2: | Statistical Mechanics | [ 80 Marks ] |
| Paper-3: | Electronics | [ 80 Marks ] |
| Paper-4: | Computational Physics And Computer Programming | [ 80 Marks ] |
| * Internal assessment in each paper | | [ 20 Marks ] |
| * Laboratory Course I-A | | [ 100 Marks ] |
| *Laboratory Course I-B | | [ 100 Marks ] |

### Electronics-I

**Unit-I** $PPHCr-304$

**Microwave devices:-**

klystron (reentrant cavities, velocity modulation, bunching process, output power and beam loading, efficiency of klystron, mutual conductance of klystron amplifier, power required to bunch the electron beam); magnetrons and traveling wave tube; velocity; modulation. Basic principles of two cavity Klystrons and reflex klystrons; principle of operation of magnetrons; helix travelling wave tube; wave modes, slow wave structure, amplification process convention current, axial electric field, wave mode, coupled cavity travelling-wave tube(physical description, principal of operation, microwave characteristic, high efficiency and collector voltage depression

## Unit-II

**Microwave guides and components (Wave Modes):-**

**(A) Rectangular wave guides:** - power transmission in rectangular wave guid, power losses in rectangular wave guide, solutions of wave equation in rectangular coordinates, TE Modes; TM Modes; excitation of modes in rectangular wave guides, characteristic of standard rectangular wave guide.

**(B) Circular wave guides:-** solutions of wave equations in cylindrical coordinates ; TE Modes; TM Modes; TEM Modes; excitation of modes in circular guides, power transmission in circular wave guide or coaxial line, power losses in circular wave guide or coaxial lines.

### Unit-III

**Transferred electron devices:-** Gunn effect Principle of operation; modes of operation; read diode; IMP ATT diode; TRAP ATT diode, baritt diode.

**Computer Communications:-** Types of network ,design
        feature of a communication network; advantage and disadvantage
**Example** –TRMNET,ARPANET ISDN LAN, FDMA, TDMA, CSMA.

### Unit-IV  ,

**RADAR:-** RADAR Block diagram and operation RADAR frequency; RADAR range equation and its derivation, minimum detectable signal; receiver noise; signal to noise ratio; Probability density function . Integration of RADAR pulse;

**Satellite Communications:-** Orbital Satellite; Geostationary satellites; Orbital Pattern, look angle, satellite system; orbital spacing.

### TEXT AND REFERENCE BOOKS

1-Advanced electonics Communication system by wayne and tomsi
2-Principle Of communication -By Toub And schilling
3Micro wave devices circuits by Samuel,YIIAU
4-Electornics communication ;george kennedy

PPHET-305
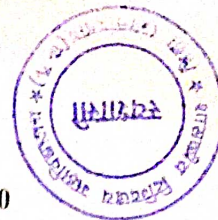
## ASTRONOMY AND ASTROPHYSICS - I

**Unit – I** Stars-apparent magnitudes, Colour index, Spectral classification, Stellar distances, Absolute magnitude, The H-R diagram of stars.

Stellar interiors: The basic equations of stellar structure, Hydrostatic equilibrium, Thermal equilibrium, Virial Theorem, Energy sources, Energy transport by radiation and convection, Equation of state

**Unit – II** Formation and evolution of stars: Inter stellar dust and gas, Formation of protostars, Pre-main sequence evolution, Post main sequence evolution and Evolution on the main sequence for low and high mass stars, Late stages of evolution, Fate of massive stars, Supernovae and its characteristics.

**Unit – III** End states of stars, Electron degeneracy pressure, White dwarfs, and Chandrasekhar limit, Neutron stars and Pulsars, Black holes.

Binary stars and their classification, close binaries, Roche Lobes, Evolution of semidetached systems: Algols, Cataclysmic variables and X-ray binaries.

**Unit– IV** Solar Physics: Physical Characteristics of sun, Photosphere: Limb darkening, Granulation, Faculae, Solar Chromosphere and Corona, Prominences, Solar Cycle and Sunspots, Solar Magnetic Fields, Theory of Sunspots, Solar flares, solar wind, Helioseismology.

## TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Camb. University Press, 2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub. Co.
3. Introductory Astronomy and Astrophysics, M.Zeilik and S.A. Gregory, 4th edition, Saunders college publishing.
4. The Physical Universe: An introduction to astronomy, F.Shu, Mill valley : University science books.
5. Textbook of astronomy and astrophysics with elements of cosmology, V.B.Bhatia, Pb -New Delhi, Narosa publishing house.

$PPHCT - 404$

# Semester-IV  PHYSICS

## year 2020-2021

**80 Marks**

### PAPER-IV
### ELECTRONICS

$PPHEF - 405$

**UNIT-1**

**Digital Communication** – Pulse modulation system; Sampling theory- Low-Pass and Band-Pass signals; PAM Channel BW for a PAM signals; Natural Sampling ; Flat-top sampling; Signal Recovery through holding; Quantization of signal ;Quantization error; Differential PCM; Delta Modulation; Adaptive Delta Modulation; CVSD, pulse code modulation, electrical representation of binary digit, vocodes (voice codes), channel vocodes, linear prediction codes.

**UNIT-2**

**Mathematical Representation** of Noise-Source of Noise; Frequency Domain; Representation of Noise; Effect of filtering on the Probability; Density of Gaussian Noise; Spectral Component of Noise ; Effect of a filter power spectral; density of Noise; Super Position of Noise; Mixing involving Noise; Linear filtering; Noise Bandwidth; Quadrature Component of Noise; Power Spectral Density of ns(t), ns(t) and their time derivative, representation of noise using orthonormal co ordinates ,.irrelivant noise components

**UNIT-3**

**Digital Modulation Technique** – BPSK; DPSK; QPSK; PSK; FSK;

**Data Transmission** – Base band receiver probability of error; Optimum filter white-noise; Matched filter and probability of error; Coherent reception; Correlation ; PSK; FSK; Non Coherent detection of FSK, duo binary encoding, A comparison of narrow band system FM system, partial response signaling, amplitude modulation of partial response signal.

**UNIT-4**

**Noise in pulse-code and Delta Modulation System**- PCM Transmission; Calculation of Quantization noise; output signal Power; Effect of Thermal Noise; output signal to Noise Ratio in PCM; DM; Quantization of Noise in DM ;Output signal power; DM output signal to Quantization Noise Ratio; Effect of thermal Noise in Delta Modulation ; output signal to noise ratio in DM, comparison of PCM and DM , the space shuttle ADM.

**TEXT & REFFERNCE BOOKS-**

1-Advanced electronic Communication system by wayne and tomsi,
2-Principle Of communication – By Toub and Schilling and Simon-Naykin,
3-Micro wave devices circuits by Samuel, YI.IAU ,
4-ELCTRONIC communicaton;george kenndy
5 Principle Of communication – By Simon-Naykin

*PPHCSF- 405*

**Semester-IV physics**
**year 2020-2021**
**Paper- IV (A)**

Marks:80

## ASTRONOMY AND ASTROPHYSICS - II

**Unit- I:**
The Milkyway Galaxy: Structure of the Milkyway, Oort's theory of galactic rotation, Dynamics of the spiral arms, Distribution of Interstellar matter, Central regions of the Milkyway.Normal Galaxies: Classification of galaxies, Hubble sequence: Elliptical, Lenticulars and Spiral galaxies, and their properties, Brightness profiles, Distribution of gas and dust in galaxies.

**Unit- II:**
Active galaxies: Active Galactic Nuclei (AGNs), Seyfert galaxies, BL Lac Objects, Radio galaxies: General properties, Superluminal motion, Quasars: Properties and Energy requirements, Nature of quasar redshifts, Supermassive black hole model and Unified model of AGNs.

**Unit- III:**
Cosmology: Cosmological principle, Observational support and other arguments to support cosmological principle, Fundamental observers and co-moving frame, Robertson-Walker line element (without derivation), Observational features of Robertson-Walker space time e.g. Red shift etc, Models of the universe, Friedmann models, Quanlitative predictions of FRW model, Quantitative solutions, Open and closed universes, Hubble's law, Angular size, Source counts, Models with the cosmological constant, Steady state cosmology.

**Unit- IV:**
Relics of the big bang, The early universe, Thermodynamics of the early universe, Thermal History, Primordial neutrinos, Helium synthesis and other nuclei, Microwave background, The very early universe, The formation of structures in the Universe, Jeans Mass, Growth Rate, Recombination era, Onset of matter dominated era.

## TEXT AND REFERENCE BOOKS:

1. Astrophysics for Physicists, Arnab Rai Choudhuri, Cambridge Uni.ty Press, 2010.
2. Modern Astrophysics, B.W. Carroll and D.A. Ostlie, Addison-Wealey Pub. Co.
3. Introductory Astronomy and Astrophysics, M.Zeilik and S.A. Gregory, 4 th edition, Saunders college publishing.
4. Theoretical Astrophysics, vol. – II: Stars and stellar systems, T. Padmanabhan, Cambridge university    press.
5. The Physical universe: An introduction to astronomy, F.Shu, Mill valley University science books.

# DEPARTMENTOFCHEMISTRY

# GOVT. DIGVIJAY PG AUTONOMOUS COLLEGE, RAJNANDGAON (C.G.)

## SYLLABUS

**M.Sc. Chemistry**
**(Approved by Board of Study for 2020-21)**
**First and Second Semester**

**Third and Fourth Semester**

**2020-21**

# DEPARTMENT OF CHEMISTRY
## GOVT. DIGVIJAY PG AUTONOMOUS COLLEGE, RAJNANDGAON

Approved syllabus for M.Sc. Chemistry by the members of Board of Studies for the
Session 2020-21
The syllabus with the paper combinations is as under

### Semester I:

| | |
|---|---|
| Paper I: CO-ORDINATION CHEMISTRY | Paper II: BASICS OF ORGANIC CHEMISTRY AND REACTION MECHANISM |
| Paper III: MATHEMATICS FOR CHEMISTS, QUANTUM CHEMISTRY AND CHEMICAL DYNAMICS | Paper IV: GROUP THEORY, PRINCIPLES OF SPECTROSCOPY AND COMPUTER FOR CHEMISTS |
| Lab Course I : PHYSICAL CHEMISTRY & COMPUTERS PRACTICAL | Lab Course II : INORGANIC CHEMISTRY PRACTICAL |

### Semester II:

| | |
|---|---|
| Paper I: TRANSITION METAL COMPLEXES AND DIFFRACTION METHODS | Paper II: BIOMOLECULES & STEREOCHEMISTRY |
| Paper III: THERMODYNAMICS, ELECTROCHEMISTRY AND SURFACE CHEMISTRY | Paper IV: SPECTROSCOPY |
| Lab Course I : ORGANIC CHEMISTRY PRACTICAL | Lab Course II: ANALYTICAL CHEMISTRY |

### Semester III:

| | |
|---|---|
| Paper I : CHROMATOGRAPHIC TECHNIQUES AND APPLICATIONS OF SPECTROSCOPY | Paper II: BIO-CHEMISTRY |
| Paper III: ORGANOTRANSITION METAL COMPLEXES | Paper IV : PHOTOINORGANIC AND ANALYTICAL CHEMISTRY |
| Lab Course I : ANALYTICAL CHEMISTRY PRACTICALS | Lab Course II: PROJECT |

### Semester IV:

| | |
|---|---|
| Paper I: PHOTOCHEMISTRY AND SOLID STATE CHEMISTRY | Paper II: ENVIRONMENTAL CHEMISTRY |
| Paper III: BIOINORGANIC AND SUPRAMOLECULAR CHEMISTRY | Paper IV: Elective – A CHEMISTRY OF MATERIAL AND RADIOCHEMISTRY  Elective - B POLYMER CHEMISTRY |
| Lab Course I: PROJECT | Lab Course II: ANALYTICAL CHEMISTRY PRACTICAL |

The syllabus for M.Sc. Chemistry is hereby approved for the session 2020-21

PCHET-404

# DEPARTMENT OF CHEMISTRY
## GOVT. DIGVIJAY PG AUTONOMOUS COLLEGE, RAJNANDGAON
### M.Sc. CHEMISTRY
### SEMESTER IV
### 2020-21
### PAPER- IV Elective - A
## CHEMISTRY OF MATERIALS & RADIOCHEMISTRY

**Max. Marks : 80**

**Min. Marks : 16**

**Unit-I**   **Chemistry of materials**
**Multiphase Materials**
Ferrous alloys, stainless steels, and nonferrous alloys, properties of ferrous and non-ferrous alloys and their application.
**Glasses, ceramics and refractories**
Glassy state, glass formers and glass modifiers, application.
Ceramic structures, Mechanical properties clay products.
Refractories, characterizations, properties & application

**Unit II**   **Composites**
Introduction, macroscopic composites and microscopic composites, Dispersion-strengthened and particle reinforced, fiber-reinforced composites.
**Nanomaterials**
Nanocrystalline phase, Methods of synthesis, sol-gel, hydrothermal, microwave assisted, reverse microemulsion/micelles, special properties, applications, polymer based nanocomposites.

**Unit - III**   **Principle and application of TGA, DTA, & DSC.**
**Polarimetry, Optical Rotatory Dispersion and Circular Dichroism**
Introduction, polarized light, optical activity, application of polarimetry, ORD and CD, rotator dispersion, instrumentation, cotton effect, anamolous ORD curves, relationship between ORD and CD, Axial haloketone rule, the octant rule. applications of octant rule, applications of ORD and CD, advantages of CD over ORD, limitations of ORD and CD.

**Unit - IV Radiation Chemistry**
Primary radiation effects. Radiation dosimetry, Radio free radicals, Radiochemistry in different media, Radiation in chemical process. Industrial application of radiation.

Nuclear Models, stability of the nucleus, radio isotopes, application of Radio isotopes in physicochemical investigation.

**Radio analytical techniques** - isotopic dilution methods, neutron activation analysis (NAA), radiometric titrations, measurement of radioactivity through with special reference to Gieger-Muller counter and application in agricultures and industry in health care in biology.

## LIST OF REFERENCE BOOKS:

1    Instrumental Technique of Analytical Chemistry, H. Kour, Pragati Publication
2    Nanoparticles – Nanocomposites, Nanomaterials: An Introduction for beginners, Dieter Volarth, Villey –VCH
3    Composite Materials: Production Properties Testing, K. Shrinivasan, Narosa
4    Composite Materials, Shivanand, Ashian Book Publication
5    PhotoChemistry and Radiation Chemistry, James F. Wishart, Danial G. Nausera

# DEPARTMENT OF CHEMISTRY
## GOVT. DIGVIJAY PG AUTONOMOUS COLLEGE, RAJNANDGAON
## M.Sc. CHEMISTRY
## SEMESTER IV
## 2020-21
## PAPER- IV Elective - B
## POLYMER CHEMISTRY

**Max. Marks 80**

**Min. Marks 16**

### Unit – I Mechanism of Polymerization

Basic concepts- Monomers, repeat units, degree of polymerization. Linear, branched and network polymers. Classification of polymers. Polymerization: Mechanism of condensation polymerization, mechanism of addition polymerization – free radical chain, cationic, anionic, coordination and mechanism of copolymerization. Polymerization conditions and polymer reactions. Polymerization in homogeneous and heterogeneous systems.

### Unit - II Kinetics and Statistics of Polymerization

Kinetics and statistics of stepwise polymerization – reactivity and molecular size, kinetics and statistics, molecular weight control. Kinetics of free radical chain polymerization, equation for kinetic chain length, degree of polymerization and chain transfer; Kinetics of cationic polymerization; kinetics of anionic polymerization. Kinetics of hetrogeneous polymerization using Ziegler Natta catalysts.

### Unit - III Structure and Properties

Morphology and order in crystalline polymers - configurations of polymer chains. Crystal structures of polymers. Polymer structure and physical properties- crystalline melting point $T_m$ - melting points of homogenous series, effect of chain flexibility and other steric factors, entropy and heat of fusion. The glass transition temperature , $T_g$ - relationship between $T_m$ and $T_g$ , effects of molecular weight, diluents , chemical structure, chain topology, branching and cross linking.

## Unit - IV Polymer Processing

Plastics, elastomers and fibers, compounding. Processing techniques: Calendering, die casting, rotational casting, film casting, injection moulding, blow moulding, extrusion moulding, thermoforming, foaming, reinforcing and fiber spinning.
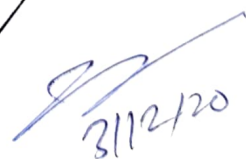
### Polymer Characterization

Polymer solutions – Criteria of polymer solubility, thermodynamics of polymer solution – ideal solution, entropy, heat and free energy of mixing.

Analysis and testing of polymers - chemical, analysis of polymers, spectroscopic methods, X-ray diffraction study, microscopy, thermal analysis and physical testing tensile strength. Fatigue, impact, tear resistance, hardness and abrasion resistance.

## LIST OF REFERENCE BOOKS

1. Polymer Science, Gowarikar, Vishwanathan, Sridhar, Willey Eastern.
2. Textbook of Polymer Science, F.W. Billmeyer, Jr. Wiley
3. Contemporary Polymer Chemistry, Alcock and Lambe, Prentice Hall.
4. Physics and Chemistry of Polymers, J.M.G. Cowie, Blackie, Acadand Professional.
5. Funcitonal Monomers and Polymers, K. Takemoto, Y. Inaki and R.M. Ottanbrite.

# GOVT. DIGVIJAY AUTONOMOUS P.G.

# COLLEGE RAJNANDGAON (C.G,)



# SYALLABUS & MARKING SCHEME

# FOR

# M.Sc. BOTANY

# YEAR

# 2020-21

ONLINE

# DEPARTMENT OF BOTANY

# 2020-21
# <u>SEMESTER PATTERN</u>
## M.Sc. BOTANY

Candidates for the M.Sc. Examination will be requiring passing in written as well as in practical examinations separately. It's compulsory to attend a part of their training at least one Botanical excursion to a Hill station (within or outside C.G.) or Seashore.

M.sc. Examination is in semester pattern, there are four semester examination within two years. In each semester there are four theory paper and two practical.

Their shall be 16 papers in theory carrying 80 marks and of three hours duration, and 16 internal assessment and 16 presentations each of 10, 10 marks and eight practical examination each carrying 100 marks. Each practical examination is based on two theory papers.

**Dr. G.K. Chandrol**
**Kalyan College**
**Bhilai, Durg, C.G.**

**Dr. Pratiksha Pandey**
**Bhiali Mahila Mahavidhyala**
**Bhilai, Durg, C.G.**

**Dr. G.S Thakur**
**Govt. V.Y.T.P.G. College**
**Durg, C.G.**

# 2020-21

## Paper – IV

M.M - 80

# PLANT DISEASE & CONTROL MECHANISM

## Unit–1. PBOCT– 404

**Diseases due to fungi:** - Rusts, Smuts, Downy mildews, Powdery mildews, Wilts, Leaf blight, Ergots, Tikka, Necrosis, Rots, Damping off, Warts.

## Unit–2.

**Diseases due to bacteria:** - Blight of rice, Tundu disease, Citrus canker, Crown gall of stone fruits, Angular leaf spots.

**Diseases due to viruses:** - Mosaic of tobacco, potato, tomato and banana; Leaf curl of tomato and papaya; Yellow vein mosaic of bhindi, Bunchy top of banana.

## Unit–3.

**Diseases due to mycoplasma:** - Sandal spike, Little leaf of brinjal, Grassy shoot disease, Citrus greening.

**Diseases due to nematodes:** - General characters of plant nematodes, Root knot, Malya disease of barley, wheat, Citrus nematodes, Ear cockles of wheat.

**Non Parasitic Disease and angiospermic parasite**

## Unit–4.

**Principles of plant disease control:** - Regulatory, chemical and biological control, breeding with resistant varieties of host plants, Plant quarantine, Recurrence of disease with special reference to rust disease in India.

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Durg, C.G.

# 2020-21
## M.Sc. (Botany) IV SEMESTER
## Elective Paper
## PAPER –III

PB08Γ-407

M.M. -

80
## ETHNOBOTANY- I

### UNIT I
• Ethnobotany: History, general account and its sub disciplines.
• Interdisciplinary approaches & aim of ethno botany.
• Ethnobotany with special reference to Chhattisgarh.
• Ethnobotanical Research done in India:
• Ethnobotany in relation to national priorities and health care programme.
• Practical application of ethnobotany for tribal development programme.

### UNIT II
• Methods and techniques in ethnobotany.
• General account of major and minor tribes of Chhattisgarh with special reference to Gond,
  Kamar, Baiga, Abujhmaria.
• Ethnobotanical aspect of art and literature.
• Ethnobotany with special reference to folklore.

### UNIT –III
• Ethnobotanical importance of Bacteria, Algae, Fungi, Bryophyta, Pteridophyta and
  Gymnosperm.
• Ethnovaterinary medicines from plants.
• Major & Minor Forest Products (NWFPs) of Chhattisgarh.
• Ethnobotany in relation to livelihood security reference to tribes.

### UNIT - IV
• Ethnobotanical study of following plants with special reference to their medicinal importance 1. Azadirachta indica (Neem) 2. Emblica officinalis (Amla) 3. Ricinus conmunis (Andi) 4. Madhuca indica (Mahuaa) 5. Cassia fistula (Amaltash) 6. Ficus religiosa (Pipal) 7. Oscimum sanctum (Tulsi) 8. Asparagus racemosus (Satavar) 9. Aloe vera (Ghrit kumari) 10. Andographis paniculata (Bhui neem).

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Bhilai, Durg, C.G.

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## Referernces:-

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- Chandel, K.P.S., Shukla, G.& Sharma, N. 1996. Biodiversity in medicinal and Aromatic Plants in India: Conservation & Utilization. National Bureau of Plant Genetic Resources, New Delhi. edition). C.A. Wadsworth, Belmont.
- Chrispeels, M.J. & Sadava, D. 1977. Plants, Food & People. W.H Freeman and Co., San Francisco.
- Ambasta S.P. (ed.) (1986). The Useful Plants of India. Publications & Information Directorate, CSIR, New Delhi India.
- Anon. (1978). The tribes of Madhya Pradesh. Dept. of Tribal Welfare, Govt. of M.P. Bhopal.
- Arnold. J. E. M. & Ruiz Perez, M, (1998). The role of non-timber forest products in conservation and development. In: Wallenberg, Eva. & Andrew Ingles (Eds.) Income from the Forest, CIFOR 1998, Indonesia, pp-17 to 41.
- Asolkar, L.V. (1992). Second Supplement to Glossary of Medicinal Plants, (CSIR) NISCOM, New Delhi, India.
- Bal, S.N. (1984). Catalogue of Medicinal Plant Exhibits. BSI. Bishne Singh Mahendra Pal Singh, Cannaught Place, Dehra Dun, India.
- Buch, M.N. (1991). Forest of Madhya Pradesh, Madhya Pradesh Madhyam Bhopal.
- Chopra, R.N.; Badhwar, R.L. & Ghosh, S. (1965). Poisonous Plants of India. Vol. I. 2nd Ed. ICAR, New Delhi, India.
- Cotton C.M, (1996). Ethnobotany: Principals and Applications, John Willey & Sons, Chichester. New York.
- Faulks. P.J. (1958) An Introduction to Ethnobotany: Moredale Publications Ltd. London, England.
- Harshberger, J.W. (1896). Purposes of Ethnobotany Bot. Gaz. 21: 146-154.
- Jain S.K. and Phuipps, R.D. (1991). Medicinal Plants of India Rec. Pub.Algonac USA 2Vols. 1-849.
- Jain, S. K. (1991). Dictionary of India folk medicine and Ethnobotany. Deep publications. NEW DELHI, pp. 1-311.
- Jain, S. K. (1995). In Manual of Ethnobotany (edt. S.K. Jain,) Scientific Pubisher, Jodhpur. 128-134.
- Jain, S.K. & Rao, R.R. (1977). A handbook off field and herbarium methods. New Delhi: Today & Tomorrow's Printers and Publishers.
- Jain, S.K. (1981). Glimpses of Indian Ethnobotany. Oxford & IBH New Delhi, India.
- Jain, S.K. (1989). Methods and Approaches in Ethnobotany. Society of Ethnobotanist. Lucknow.

- Jain, S.K. and Mudgal, Hand Book of Ethanobotany. Bisen pal Singhm Mahendra Pal Singh Publication.
- Vaishnaw T.K. (2004). Chhattisgarh ki Anusuchit Janjatiyan, Adim Jati Anusandhan Avam Prshikshan Sansthan Durg. Prakashan kramank 2, pp. 1-120
- Varghese, E. S. V D. (1996). Applied Ethnobotany - A case study among the Kharias of Central India. New Delhi. Deep Publications
- Jajoria, E, V.K. (1998); "The Kamar [A way of life.] Vanya Prakashan., Tribal Research and Development Institute. 35, Shamla Hills, Bhopal., ethnobot. Res.2:303- 3 15.
- Joshi, S.G. (2000). Medicinal Plants, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, India.
- Kirtikar, K. R. & Basu, B.D. (1933-1935). Indian Medicinal plants. Vol.I to VIII (4 Vols. text & 4 vols. plates) Reprint 1994, Dehradun U.P.
- Maheshwari, J.K. Ed. (2000). Ethnobotany and Medicinal Plants of Indian Subcontinent. Scientific Publishers, Jodhpur
- Martin, G.J. (1995). Ethnobotany. Chapman and Hall, London. Suggested Laboratory

**Exercises:-**

1. Description and identification of medicinal plants and its medical properties.
2. Preparation of medicinal plants herbarium and photographs.
3. Herbal preparation:- a. Extract of Tulsi leaves. b. Ointment from Neem Leaves. c. Ayurvedic tooth powder. d. Face pack preparation from various herbs. e. Preparation of Triphla. f. Kwath of Triphla. g. Preparation of diabeties controlled powder. h. Preparation of herbal shampoo.
4. To cultivate at least two medicinal plant in earthen pot.
5. Field Study of Forest area or Tribal area.
6. Documentation technique of Ethnobotanical knowledge.
7. To separate active principles from the extract of Medicinal plant.


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# 2020-21

## M.Sc.(Botany) IV SEMESTER
### ELECTIVE PAPER
### PAPER –IV

**M.M. 80**

### ETHNOBOTANY - II

PBOGr-408

### UNIT - I
• Plant Conservation by Tribes and role of Joint Forest Management Programme in Plant Conservation specially People's Protected Area
• Ethnobotany and its role in domestication and conservation of native plant and genetic resources.
• The protection of plant varieties.
• General account of conservation of medicinal plants.
• General role of Aromatic plants.

### UNIT -II
• General ideas of various system of medicine using plants.
• Basic knowledge of Ayurvedic, Homeopathic, Allopathic system of medicine.
• General idea of active principles of Plants.
• Herbal Cosmetics.
• General account of toxic plants and Harmful effect of plants on human society with special reference to allergic plants of Chhattisgarh.

### UNIT –III
• Endemic plants of Chhattisgarh.
• Endangered plants of Chhattisgarh.
• Techniques of cultivation and marketing of Aromatic plants –Podina, Lemon grass.
• Techniques of cultivation, marketing and importance of mushroom
• Techniques of cultivation, extraction of juice and importance of wheat grass.

### UNIT -IV
• Ethnobotanical study of the following plants with special reference to their medicinal importance1. Allium sativum (Lahsun) 2. Aegle marmelos (Bel) 3. Terminallia arjuna (Arjun)  4 T. bellerica (Bahera) 5. T. chebula (Harra) 6. Chlorophytum borivianum (Safed Musli) 7. Thuja occidentalis (Vidhya) 8 Dhatura alba (Dhatura) 9. Argemone maxicana (Pili kateli) 10. Moringa oleifera (Munga).

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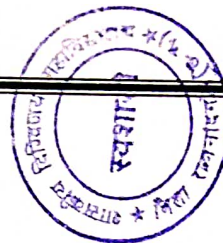Govt. V.Y.T.P.G. College
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**References :-**

- Baker, H.G. 1978. Plants and Civilization (3 rd
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- Anon. (1978). The tribes of Madhya Pradesh. Dept. of Tribal Welfare, Govt. of M.P. Bhopal.
- Arnold. J. E. M. & Ruiz Perez, M, (1998). The role of non-timber forest products in conservation and development. In: Wallenberg, Eva. & Andrew Ingles (Eds.) Income from the Forest, CIFOR 1998, Indonesia, pp-17 to 41.
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- Jain, S.K. & Rao, R.R. (1977). A handbook off field and herbarium methods. New Delhi: Today & Tomorrow's Printers and Publishers.
- Jain, S.K. (1981). Glimpses of Indian Ethnobotany. Oxford & IBH New Delhi, India.
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**Dr. G.K. Chandrol**
**Kalyan College**
**Bhilai, Durg, C.G.**

**Dr. Pratiksha Pandey**
**Bhiali Mahila Mahavidhyala**
**Bhilai, Durg, C.G.**

**Dr. G.S Thakur**
**Govt. V.Y.T.P.G. College**
**Durg, C.G.**

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- Martin, G.J. (1995). Ethnobotany. Chapman and Hall, London. Suggested Laboratory

**Exercises:-**
1. Description and identification of medicinal plants and its medical properties.
2. Extraction of phytochemicals from various medicinal plants.
3. Preparation medicinal plants herbarium and photographs.
4. Herbal preparation – a. Preparation of digestive powder. b. Mouth freshener of Ajwain. c. Beverage of Tulsi, Bel, Tikhur, Mango. d. Ayurvedic tea preparation. e. Tablet of amla vati.  f. Murabba of Awla/Bel. g. Herbal dye h. Shitopladi powder.
5. Identification and study of Ethnobotanical importance of some plants of Rajnandgaon.
6. To cultivate at least two medicinal plant in earthen pot.


Dr. G.K. Chandrol
Kalyan College
Bhilai, Durg, C.G.

Dr. Pratiksha Pandey
Bhiali Mahila Mahavidhyala
Bhilai, Durg, C.G.

Dr. G.S Thakur
Govt. V.Y.T.P.G. College
Durg, C.G.

PB0EL-409   **2020-21**

# PRACTICAL II (FOR ELECTIVE PAPER)
## (ETHNOBOTANY I AND ETHANOBOTANY II)

| | | |
|---|---|---|
| (i) | Major Practical........................................................ | 20 |
| (ii) | Minor Practical ...................................................... | 10 |
| (iii) | Field report............................................................. | 10 |
| (iv) | Techniques............................................................... | 15 |
| (v) | Spotting................................................................... | 15 |
| (vi) | Viva......................................................................... | 10 |
| (vii) | Sessional................................................................. | 20 |

Total – 100 marks

**Dr. G.K. Chandrol**
**Kalyan College**
**Bhilai, Durg, C.G.**

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**Bhiali Mahila Mahavidhyala**
**Bhilai, Durg, C.G.**

**Dr. G.S Thakur**
**Govt. V.Y.T.P.G. College**
**Durg, C.G.**

PBOGL-410

**2020-21**

**Project (Optional)**

| Project Work | External | Internal | Total |
|---|---|---|---|
| Dissertation | 240 | 60 | 300 |
| Seminar based on project | 160 | 40 | 200 |
| Viva-voce | 80 | 20 | 100 |
| Total | | | 600 |

1. A Student of IV Semester will have the option to opt for project work in lieu of four
   theory papers and two lab courses provided.
2. He/she secures at-least 65% or more marks in aggregate in semester I and II Semester.
3. The project has to be carried out in recognized national laboraties or UGC recognized universities or any other reputed organization of public and private concern.
4. The valuation of all the projects will be carried out by the external examiner.

   The project work should be related to the field of Botany. The project report should include declaration by the candidate, certificate by the supervisor, acknowledgement, title and introduction along with the following points.
   1. Introduction.
   2. Review of Literature.
   3. Materials and Methods.
   4. Results and Discussion.
   5. Summary.
   6. Bibilography.

Dr. G.K. Chandrol
Kalyan College
Bhilai, Durg, C.G.

Dr. Pratiksha Pandey
Bhiali Mahila Mahavidhyala
Bhilai, Durg, C.G.

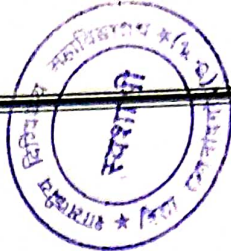Dr. G.S Thakur
Govt. V.Y.T.P.G. College
Durg, C.G.

# GOVT. DIGVIJAY P.G. AUTONOMOUS COLLEGE RAJNANDGAON (C.G.)

## DEPARTMENT OF ZOOLOGY
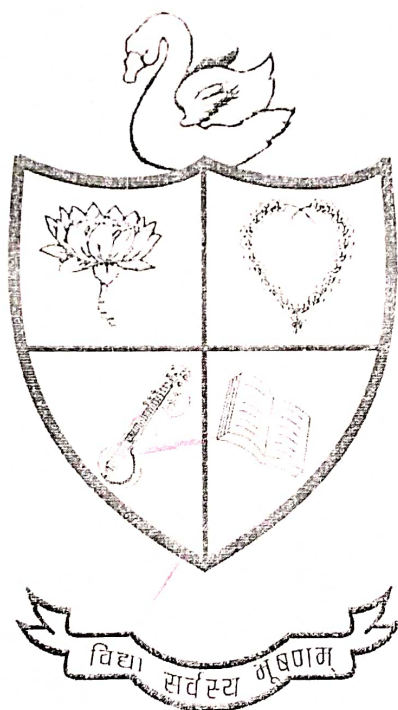


## M.Sc. Zoology Semester I – IV

### Syllabus

### (2020 – 2021)

# GOVT. DIGVIJAY COLLEGE RAJNANDGAON
## DEPARTMENT OF ZOOLOGY
### (2020 – 21)

## Syllabus based on Credit Based System

t post-graduate level, candidates are required to study 16 Paper in I[st], IInd, IIIrd and IVth semester amination (4 - papers in each semester). There will be sixteen papers in each post-graduate amination in zoology containing 80 credits. In first, second, third and fourth semester, each paper rry 100 marks (80 marks for external examination and 20 marks for internal examination). All four mester including two practical, each practical is containing 100 marks. There shell be 2400 marks in .Sc. Candidates shall have to secure 36 percent marks in aggregate of all papers in order to pass the .Sc. Examination. (Semester IV has two optional subjects, Elective A & Elective B, out of which udent has choose to option one).

| Semester | Title of Paper | Credits |
|---|---|---|
| I[st] SEMESTER | I. Structure and Functions in Invertebrates | 4 |
| | II. Biosystematics And Taxonomy | 4 |
| | III. Comparative Anatomy of Vertebrates | 4 |
| | IV. Population Ecology and Quantitative Biology. | 4 |
| | Practical I- Based on Paper I & II | 2 |
| | Practical II- Based on Paper III & IV | 2 |
| | | 20 |
| IInd SEMESTER | I. Molecular Cell Biology | 4 |
| | II. Environmental Physiology & Ecology | 4 |
| | III. General and Comparative Endocrinology | 4 |
| | IV. Tools and Techniques in Biology | 4 |
| | Practical I- Based on Paper I & II | 2 |
| | Practical II- Based on Paper III & IV | 2 |
| | | 20 |
| IIIrd SEMESTER | I. Animal Behaviour | 4 |
| | II. Population Genetics and Evolution | 4 |
| | III. Gamete and Developmental Biology | 4 |
| | IV. Comparative Physiology of Vertebrates | 4 |
| | Practical I- Based on Paper I & II | 2 |
| | Practical II- Based on Paper III & IV | 2 |
| | | 20 |
| IVth SEMESTER | Elective A: Fish & Fisheries and Aquaculture | |
| | I. Limnology | 4 |
| | II. Ichthyology | 4 |
| | III. Capture Fisheries | 4 |
| | IV. Fisheries and Aquaculture | 4 |
| | Practical I- Based on Paper I & II | 2 |
| | Practical II- Based on Paper III & IV | 2 |
| | | 20 |
| IVth SEMESTER | Elective B: Insect Biology & Physiology | |
| | I. Characteristics, classification & Types | 4 |
| | II. Gross Morphology of Insects | 4 |
| | III. Insect Physiology | 4 |
| | IV. Behavior and Economic Importance. | 4 |
| | Practical I- Based on Paper I & II | 2 |
| | Practical II- Based on Paper III & IV | 2 |
| | Total Credits | 80 |

2

PZOCT - 402

## Elective A : Fish & Fishries and Aquaculture

## M.SC. ZOOLOGY SEMESTER- IV
### ( 2020 - 2021 )
### PAPER II
### ICHTHYOLOGY                              M.M. 80

**Objectives**: - This syllabus contains study of general characters, classification and phylogeny of fishes and fish biology and fish anatomy.

UNIT – I - General Characteristic & Classification of Fish
1. Placoderm
2. Chondrichthyes
3. Osteichthyes
4. Holocephali
5. Dipnoi

UNIT – II - Anatomy:-
1. Integuments (Skins and its derivatives)
2. Medium paired Fins of Fishes
3. Food and Alimentary canal, Modification of Alimentary canal
4. Blood Vascular System
5. Respiration- Respiratory Organs and Mechanism, A.R.O.

UNIT-III
1. Swim bladder- structure & functions
2. Nervous system
3. Sense organs (eye, membranous labyrinth, lateral line system)
4. Endocrine glands in fishes
5. Fish diseases and their control

UNIT-IV
1. Excretion (structure of kidney , histology)
2. Osmoregulation – in marine and fresh water fishes
3. Reproduction and development
4. Hatching and post embryonic development
5. Parental care in fishes.

## SUGGESTED READING MATERIAL
1. Anintroduction to Fishes S.S. Khanna.
2. Fish and Fisheries R.P.Parihar.
3. Fisheries and Aquaculture R.C. Gupta and P.K. Gupta-
4. Biology of Fishes - Jingran.

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PZOCL–405

**Elective A: Fish & Fishries and Aquaculture**

## M. Sc. ZOOLOGY SEMESTER – IV
### ( 2020 - 2021 )

## LAB COURSE I BASED ON PAPER I& II        MM 100

1. Chemical analysis of pond water (DO, Free Carbon dioxide , pH, Transparency Conductivity, turbidity and alkalinity)
2. Study of representative fishes from museum specimens.
3. Study of histology through permanent slide of fish.
4. Dissections to show cranial nerve and accessories respiratory organ. (presentation through alternative technique )


## EXAMINATION SCHEME.

| | | | |
|---|---|---|---|
| 1. Major  dissection of fish | = | 15 |
| 2. Minor  dissection of fish | = | 10 |
| 3. Spotting | = | 20 |
| 4. Physcio-chemical parameter test of fresh water pond | = | 20 |
| 5. viva-voice | = | 15 |
| 6. Sessional | = | 20 |

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                                        Total        =    **100 Marks**

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# PZOCT-403

**Elective A : Fish & Fishries and Aquaculture**
**M.SC. ZOOLOGY SEMESTER IV**
**( 2020 - 20 21 )**
**PAPER III**
**CAPTURE FISHERIES**

MM 80

**Objectives:** - This syllabus contains study of general characters, food commodity, diversity, Ecology of aquatic ecosystem of fishes.

## UNIT –I
1. Fish as food commodity ( Biochemical composition of raw fish and nutritional value of raw fish )
2. Systematic and bionomics of some fresh water fishes.
3. Fishing gear and crafts
4. Unconventional fishing methods (electo fishing, light fishing, ecosounder and sonar.)

## UNIT-II
1. Marine fisheries of India.
2. Riverine fishes.
3. Estuarine fisheries.
4. Cold water fisheries.
5. Fisheries of reservoir and pond.

## UNIT –III - Ecology of aquatic ecosystem
1. Rivers and streams
2. Reservoirs
3. ~~Lacks~~ Lakes
4. Brackish water
5. Ocean
6. Fish farm pond

## UNIT IV
1. Pollution of water bodies
2. Effects of pollutants on fish life
3. Control and abatement of pollution
4. The EEZ concept and its implementation
5.

## SUGGESTED READING MATERIAL
1. Source book for the inland fishery resources of Africa.J.P.Vandan.Bossche.G.M.Bernacsek.
2. Capture based Aquaculture F.Ottolenglin, F Silvestri..
3. Technologycal trends in capture fisheries.J.W.Waled, Marsen 2001.
4. Gloom and doom the future of marine capture fisheries.S.M.Garcia and Grainger.

PZOCT-404

**Elective A : Fish & Fisheries and Aquaculture**
**M.SC. ZOOLOGY SEM IV**
( 2020-21 )
**PAPER -IV**
**FISHERIES AND AQUACULTURE**       MM 80

**Objectives:** - This syllabus contains study of Aquaculture, Cultivable Fisheries, fish culture and farming of fishes.

## UNIT I
1.  Aquaculture (aims, objectives, strategies adapted)
2.  Physico-chemical and biological characteristics of fish pond.
3.  Fish ponds (planning construction and layout).
4.  Maintenance and improvement of the fish form.
5.  Aquatic weeds and their control

## UNIT II
1.  Principle Cultivable Fishries.
2.  Fish Seed (collection, identification and transportation)
3.  Induced breeding in fishes
4.  composite fish culture
5.  Air breathing fishes

## UNIT III
1.  Paddy- cum -fish culture.
2.  Sewage -fed fish forming.
3.  Larvicidal fishes (characteristics, propogation and introduction in water bodies)
4.  Exotic Fishes
5.  Open water stocking and ranching

## UNIT IV
1.  Harvesting The Fishes  (harvesting, sorting, preservation and processing)
2.  Fish Byproduct.
3.  Fish Marketing
4.  Prawn fisheries (capture and culture)
5.  Molluscan fisheries (capture and culture)
    Fish disease and their control.

## SUGGESTED READING MATERIAL
1.  Aquaculture and fisheries. Wageningen.U.R.
2.  Fish forming Aquaculture Commerrical fishing WWW.ftal.com.
3.  Aquaculture fisheries and fish Science Wiley.

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P20CL-406

**Elective A: Fish & Fisheries and Aquaculture**
**M. SC. ZOOLOGY SEMESTER - IV**
**( 2020 - 2021 )**

## LAB COURSE II – BASED ON PAPER III & IV          MM 100

1. Identification of phyto and zooplanktons
2. Study of aquatic weed and aquatic insects
3. Identification of fish
4. Identification fish egg, fry and fingerlings.
5. To determine the edge of fish by reading scale.
6. Estimation of number of egg(fecundity and counting of eggs)
7. Study of histology through permanent slide of fish (microtomy)
8. To determine the state of maturity of fish (Nikolsky, 1963)

## EXAMINATION SCHEME

| | | |
|---|---|---|
| 1. Fish identification | = | 20 |
| 2. Spotting 10 | = | 20 |
| 3. Local fish collection | = | 10 |
| 4. Age determination | = | 15 |
| 5. Viva | = | 15 |
| 6. Sessional | = | 20 |
| **TOTAL** | = | **100 Marks** |

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PZOGT-405

**Elective B; Insect Biology and Physiology**
**M.Sc. ZOOLOGY SEMESTER IV**
**(2020 - 20 21)**
**PAPER -I**
**CHARACTERISTICS, CLASSIFICATION AND TYPES**          M.M 80

Objectives: - This syllabus contains study of general characters, classification and phylogeny of insects and insect biology and insect anatomy.

### UNIT-I
1.  General characteristics of insects.
2.  Classification of different group of insects with important examples.

### UNIT-II
1.  Study of the morphology and various organ systems of Periplaneta.

### UNIT- III
1.  Study of the morphology and various organ systems of Grasshopper

### UNIT - IV
1.  Reproductive organs and fertilization in insects.
2.  Growth and development of insects.( pre- embryonic and post-embryonic)

**Suggested reading materials**

1.  Insect structure and function -R.FChapman.
2.  General and applied entomology.- Little.
3.  Insect physiology- Wigglesworth.

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PZOGT-406

**Elective B ; Insect Biology And Physiology**
**M.Sc ZOOLOGY SEMESTER – IV**
**(2020 - 2021   )**
**PAPER -II**
**GROSS MORPHOLOGY OF INSECTS**                     M.M.80

**Objectives**: - This syllabus contains study of morphology and insect anatomy.

## UNIT –I
1. 1.Appendages of insects  (head, thoracic and abdominal)
2. Integument in insects.
3. Respiratory structure of insects.

## UNIT - II
1. Blood vessels and pumping organs in insects.
2. Nervous system in insects.

## UNIT-III-

2. Structure of simple eyes in insects.
1. Compound eye
2. Mechanism of image formation

## UNIIT - IV
1. Reproductive system in insecct.
2. Metamorphosis
3. Endocrinal regulation of metamorphosis.

## Suggested Reading  Material
1. An introduction to the study of insects by borer and Delong.
2. Imms entomology by imms
3. General and applied entomology by nayer.
4. Entomology text book by jack de angelis.

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PZOGL-405

Elective B ; Insect Biology And Physiology

## M,Sc ZOOLOGY SEMESTER –IV
### ( 2020 - 2021 )
### Lab Course - (Based on paper I & II)        M M 100

1. Study of insects through museum specimens        .
2. Identification of insects.
3. Dissection to show different organs.

## Examination scheme

| | | |
|---|---|---|
| 1. Major dissection | = | 15 marks |
| 2. Minor dissection | = | 05 marks |
| 3. Spotting | = | 20 marks |
| 4. Identification of insects. | = | 10 marks |
| 5. Slide prepration of organ | = | 15 mark |
| 6. Viva | = | 15 marks |
| 7. Sessional( internal ) | = | 20 marks |

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Total =        100 marks

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PZOET-407

**Elective B; Insect Biology And Physiology**

## M.Sc. ZOOLOGY SEMESTER – IV
### ( 2020 - 2021 )
### PAPER -III
### INSECT PHYSIOLOGY

MM 80

**Objectives:** - This syllabus contains study of morphology of diversified insect.

### UNIT - 1
1. Physiology of nutrition, digestion in insect.
2. Intermediary metabolism.
3. Physiology of circulation and hemocyte in insect.

### UNIT -II
1. Physiology of Terrestrial respiration.
2. Physiology of aquatic respiration.
3. Physiology of respiration parasitic insects.

### UNIT -III
1. Regulation of salt and water in insect.
2. Muscular system and movement.
3. Physiology of sonification in insects.

### UNIT - IV
1. Mechanism of vision in insects.
2. Physiology of chemical communication.
3. Neuro-endocrinal physiology, its influence.
4. Pheromones.

### Suggested reading materials:-
1. Physiology of insects by Barrington.
2. General and applied Entomology by K.K. Nayer.
3. Medical physiology by Bijlani.

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PZOET-408

**Elective B : Insect Biology And Physiology**

**M.Sc. ZOOLOGY SEMESTER - IV**
**(2020 - 2021)**
**PAPER - IV**
**BEHAVIOUR AND ECONOMIC IMPORTANCE**            M.M. 80

**Objectives:** - This syllabus contains study of Behaviour, Economic Importance of insect and insect pest management.

**UNIT- I**
1. Social behavior in insects.
2. Innate and Learned Behaviour and waggle dance.
3. Neuro – physiology basis of behavior.

**UNIT-II**
1. Adaptive value of insect behavior.
2. Insect pests of corp.
3. Insect pest management.

**UNIT -III**
1. House holds insects, parasitic insect,
2. Mites, Ticks and their control.
3. Life cycle of Moth and Ants

**UNIT –IV**
1. Apiculture.
2. Sariculture.
3. Lac- culture

**Suggested Reading Materials.**
1. General and applied Entomology by K.K. Nayer.
2. Insect physiology By Wigglesworth.

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PZOEL-406

**Elective B ; Insect Biology And Physiology**

**M.Sc. ZOOLOGY SEMESTER - IV**
**(2020 - 2021  )**

**LAB COURSE – II (Based on paper III & IV)**          **M.M. - 100**

1. Dissection to show endocrinal bodies of insects.
2. Identification of insects of economic important (assign taxonomic position.)
3. Spots of insects (museum specimens)
4. Histological preparation through microtome.
5. Slide preparation.

### Examination scheme

| | | |
|---|---|---|
| 1. Dissection (endocrine gland) | = | 15 marks |
| 2. Identification of insects. | = | 10 marks |
| 3. Spots (museum specimens -10) | = | 20 marks |
| 4. Histology through microtome | = | 20 marks |
| 5. Slide preparation. | = | 10 marks |
| 6. Viva | = | 15 marks |
| Sessional | = | 10 marks |

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**Total**   **=**   **100  Marks**

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# Department of Biotechnology

Syllabus

M. Sc. Biotechnology
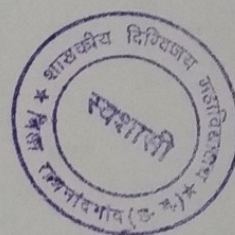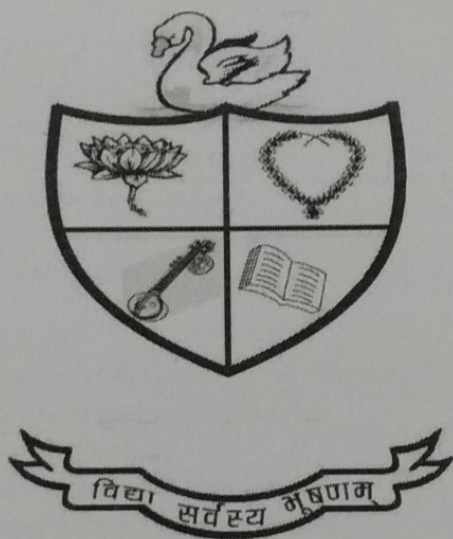
**Govt. Digvijay Post Graduate (Autonomous) College**

**Rajnandgaon (C.G.)**

[Based on Credit System]

## SCHEME OF SEMESTER EXAMINATION FOR SESSION 2020-21
### Department of Biotechnology, Govt. Digvijay P. G. College Rajnandgaon, (C.G.)
### M. Sc. BIOTECHNOLOGY (Semester I to IV)

| First Semester MSBTC 01 | Paper | Title of Paper | Marks (External) | (Internal) |
|---|---|---|---|---|
| | 1* | Cell Biology | 80 | 20 |
| | 2 | Genetics | 80 | 20 |
| | 3 | Microbial Physiology | 80 | 20 |
| | 4 | Bio-molecules | 80 | 20 |
| | LC-1 | Lab Course 1 (Based on paper 1 & 2) | 80 | 20 |
| | LC-2 | Lab Course 2 (Based on paper 3 & 4) | 80 | 20 |
| | | Total | 600 | |

| Second Semester MSBTC 02 | Paper | Title of Paper | (External) | (Internal) |
|---|---|---|---|---|
| | 5 | Biostatistics & Computer Applications in Biotechnology | 80 | 20 |
| | 6 | Molecular Biology | 80 | 20 |
| | 7 | Plant Biotechnology | 80 | 20 |
| | 8 | Macromolecules & Enzymology | 80 | 20 |
| | LC-3 | Lab Course 3 (Based on paper 5 & 6) | 80 | 20 |
| | LC-4 | Lab Course 4 (Based on paper 7 & 8) | 80 | 20 |
| | | Total | 600 | |

| Third Semester MSBTC 03 | Paper | Title of Paper | (External) | (Internal) |
|---|---|---|---|---|
| | 9 | Genetic Engineering | 80 | 20 |
| | 10 | Biology of Immune System | 80 | 20 |
| | 11 | Bioprocess Engineering & Technology | 80 | 20 |
| | 12 | Environmental Biotechnology | 80 | 20 |
| | LC-5 | Lab Course 5 (Based on paper 9 & 10) | 80 | 20 |
| | LC-6 | Lab Course 6 (Based on paper 11 & 12) | 80 | 20 |
| | | Total | 600 | |

| Fourth Semester MSBTC 04 | Paper | Title of Paper | (External) | (Internal) |
|---|---|---|---|---|
| | 13 | Basic Concept of Bioinformatics & Nanobiotechnology | 80 | 20 |
| | 14 | Advanced techniques in Biotechnology | 80 | 20 |
| | 15 | Animal Biotechnology | 80 | 20 |
| | 16 | Functional Genomics & Proteomics | 80 | 20 |
| | LC-7 | Lab Course 7 (Based on paper 13 & 14) | 80 | 20 |
| | LC-8 | Lab Course 8 (Based on paper 15 & 16) | 80 | 20 |
| | | Total | 600 | |

| | OR | | | |
|---|---|---|---|---|
| | Paper | Title of Paper | (External) | (Internal) |
| | 13 | Basic Concept of Bioinformatics & Nanobiotechnology | 80 | 20 |
| | 14 | Advanced techniques in Biotechnology | 80 | 20 |
| | LC-7 | Lab Course 7 (Based on paper 13 & 14) | 80 | 20 |

| | And | | | |
|---|---|---|---|---|
| | Project Work*** | | 300 | |
| | Dissertation | | 120 | 30 |
| | Seminar based on project | | 80 | 20 |
| | Viva-voce | | 40 | 10 |
| | Grand total [Semester I + II + III + IV] | | 2400 | |

*Each theory paper will have four units but the external evaluation of each paper (80 Marks) will be done in **three parts (A, B and C)**.

# Project

## PBTEL-408

| Project Work | External | Internal | Total |
|---|---|---|---|
| Dissertation | 120 | 30 | 150 |
| Seminar based on project | 80 | 20 | 100 |
| Viva-voce | 40 | 10 | 50 |
| Total | | | 300 |

1. A student of IV semester will have the option to opt for project work in lieu of two theory papers and one lab courses.
2. The project has to be carried out in recognized national laboratories or UGC recognized universities or any other organization of public or privet concern. The duration of project will be 90 days.
3. The department also gives opportunity to do project work maximum 02 students per faculty based on merit marks obtained in Semester I and II.
4. The valuation of all the projects will be carried out by the external examiner.

The project work should be related to the field of Biotechnology. The project report should include declaration by the candidate, certificate by the supervisor, acknowledgement, title and introduction along with the following points:

1. Introduction
2. Review of Literature
3. Materials and Methods
4. Results & Discussion
5. Summary
6. Bibliography

| Signature | | | | | Date |
|---|---|---|---|---|---|
| Board of Studies | Chairman Dr. Pramod Kumar Mahish (H.O.D.) | Subject Expert Mrs. Soumya Khare | Subject Expert Mrs. Dr. Subha Diwan | Subject Expert Mr. Tarun Patel | 15-09-2020 |

# GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE

## RAJNANDGAON, C.G.

**SESSION 2020 – 2021**

**SCHEME OF EXAMINATION**

**&**

**SYLLABUS**

**OF**

**M.Sc. (MICROBIOLOGY)**

**UNDER**

**FACULTY OF LIFE SCIENCES**

**(Approved by Board of Studies)**

**Effective from July 2020**

**DEPARTMENT OF MICROBIOLOGY**

**GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE**

**RAJNANDGAON, C.G.**

**Unit – 1**      $PMBCT - 404$

Antibiotics and synthetic antimicrobial agents (Aminoglycosides,β-lactams, tetracyclines, ansamycins, macrolid antibiotics).

Antifungal antibiotics, antitumor substance.Peptide antibiotics, Chloramphenicol, Sulphonamides and Quinolinone antimicrobial agents.

Chemical disinfectants, antiseptics and preservatives.

**Unit – 2**

Mechanism of action of antibiotics (inhibitors of cell wall synthesis, nucleic acid and protein synthesis).

Molecular principles of drug targeting. Drug delivery system in gene therapy Bacterial resistance to antibiotics.

Mode of action of bacterial killing by quinolinones. Bacterial resistance to quionolinones.

Mode of action of non – antibiotic antimicrobial agents.

**Unit – 3**

Microbial contamination and spoilage of pharmaceutical products (sterile injectables, non-injectables, ophthalmic preparations and implants) and their sterilization.

Manufacturing procedures and in process control of pharmaceuticals.

New vaccine technology, DNA vaccines, synthetic peptide vaccines, multivalent subunit vaccines. Vaccine clinical trials.

**Unit – 4**

Financing R&D capital. Government regulatory practices and policies, FDA perspective.

Reimbursement of drugs and biologicals, legislative perspective.Rational drug design. Immobilization procedures for pharmaceutical applications (liposomes).

Biosensors in pharmaceuticals. Application of microbial enzymes in pharmaceuticals.

PMBET-405

## Unit 1:

Introduction   Soil as an environment for microorganisms. Classification of soil, physical and chemical properties of soil, structure of soil.

Microbial interactions - mutualism, commensalism, amensalism, synergism, parasitism, predation and competition.

Microbial interactions between plants–phyllosphere, mycorrhizae, rhizosphere and symbiotic association in root nodules. Biofertilizer – VAM, Rhizobium, Azospirillum, Azotobacter, cyanobacteria and Azolla.

## UNIT 2:

Some bacterial diseases of agricultural crops -pathogens, symptoms and control measures with reference to paddy, cotton, maize, tomato, citrus, mango and potato.

Plant protection – phenolics – phytoalexins and related compounds. Bioinsecticides – viral, bacterial and fungal- a brief note.

## UNIT 3:

Soil microbes and fertility of soil. Roles of microbes in biogeochemical cycles – carbon, nitrogen, phosphorus, Sulphur. Soil microbes and fertility of soil.

Aerobiology – a brief introduction - droplet nuclei – aerosols - air borne transmission of microbes and diseases -assessment of air quality.

## UNIT 4:

Aquatic microbiology - factors affecting microbial growth – temperature – pressure – light – salinity - turbidity – pH -inorganic and organic constituents.

Aquatic habitats - freshwater - lakes, ponds and streams; marine habitats - estuaries, sea, hydrothermal vents, saltpans, coral reefs, mangroves and their associated microbial communities; Role of microbes in zonation – food chain and food web.

# (2020-2021)

## Project (Optional)

PIMBEL- 408

| Project Work | External | Internal | Total |
|---|---|---|---|
| Dissertation | 150 | 50 | 200 |
| Seminar based on project | 80 | 20 | 100 |
| **Total** | **230** | **70** | **300** |

1. A Student of IV Semester will have the option to opt for project work in lieu of four theory papers and two lab courses provided he/she secures at-least 65% or more marks in aggregate in semester I and II Semester.

2. The project has to be carried out in recognized national laboraties or UGC recognized universities or any other reputed organization of public and private concern.
3. The valuation of all the projects will be carried out by the external examiner.

The project work should be related to the field of microbiology. The project report should include declaration by the candidate, certificate by the supervisor, acknowledgement, title and introduction along with the following points.

1. Introduction.
2. Review of Literature.
3. Materials and Methods.
4. Results and Discussion.
5. Summary.
6. Bibliography.

एम.ए. पूर्व–हिन्दी
चतुर्थ सेमेस्टर

पंचम प्रश्नपत्र : व्यावहारिक हिंदी

(हिंदी रचना और व्यवहार)

निर्धारित छत्तीसगढ़ी पहेलियां    PHNET-407

छत्तीसगढ़ी पहेलियां :

1.  अताल ओखर मां–बाप पताल ओखर थाना, एक फूल फूले न डारा न पाना –मशरूम
2.  अहो हरि, अहो हरि फूल ता छोड़ के कनिहा में फरी–भुट्टा
3.  हमर देस मा अइसा हुआ, आधा बगुला आधा सुवा–मूली
4.  आजकाल्हु नार फटके, सावन–भादो मुरझा–दररा / दरार
5.  आजू–बाजू गोल–गोल, पीछू हा चकरट्ठा–बैलगाड़ी
6.  आय लुलु, बाय लुलु, पानी मा डराय लुलु–जूता
7.  ईंटा–पथरा के घर बनावे, बिलवा बइला के मन नइ आये–चूहा
8.  ए पार पचरी, ओ पार पचरी, बीच मा मोंगरी मछरी–जीभ
9.  एक ठन कुरिया गा नधना नरियाय–जांता
10. एक ठन चिंआ घर–घर लहू–चिमनी
11. एक ठन थारी में दो अंडा, एक गरम एक ठंड़ा–सूरज–चांद
12. एक महतारी के साठ लइका, कोनो मरे कोना जीये–माचिस
13. एक निसेनी के बारा फरका, नी जाने रोकर सास नकटी–छाता
14. एक लारी चार डरामर, एक सवारी, बाकी सब कंडेक्टर– शवयात्रा
15. एक नार के दू लइका, दुनों के एके रंग। एक खड़े एक फिरे, फेर दुनो एके संग–जांता
16. एक कटोरी मां बारा रसगुल्ला, अउ ओगे तीन चम्मच–घड़ी
17. एक पेड़ झंझाकर, ओमे गुद अउ गांकर–महुआ पेड़
18. ओमनाथ बखरी गें राखे ता कांटा, एक फूल फूले पचास ठन बांटा–केला
19. कुकुर गेहे इलाहाबाद, पूंछी हगरे पास–कुंआ की बाल्टी
20. कोरबा तोर मइके, गांव तोर सासुराल, गली–गली तोर मनसरवा, घर–घर तोर लइका–बिजली
21. खार भर चरे, एको नई खावे–हंसिया
22. खाय के बेर राफेद, निकले के बेर करिया–सीताफल
23. घना जंगल में लाल पानी गिरे–जूं
24. घाम मं जन्मे, छांव परत मर जाय–परीना
25. चार चिरई के चार रंग, साहल में जाके एके रंग–पान

## (साहित्यकार एवं उनकी रचनागत विशेषताएं)

**PHNET-408**     पूर्णांक     80+20=100

**पाठ्य-विषय :** यह प्रश्नपत्र ऐच्छिक है। प्रदेश के बाहर से आनेवाले विद्यार्थियों की रुचि का ध्यान रखते हुए चतुर्थ प्रश्नपत्र 'छत्तीसगढ़ी' के स्थान पर इस प्रश्नपत्र का विकल्प रखा गया है।

निम्नलिखित चार में से किसी एक का विस्तृत अध्ययन-अध्यापन आवश्यक होगा—

### क. कबीरदास :

पाठ्य विषय—साखी, सबद रमैनी

1. कबीर का जीवन परिचय एवं साहित्यिक विशेषताएं
2. कबीर का रहस्यवाद एवं उलटबांसियां
3. व्याख्या— कबीर ग्रंथावली से निर्धारित साखियां और पद

### अंक विभाजन

1. **खंड–क :** संपूर्ण पाठ्यक्रम से 3–3 अंको के 4 प्रश्न          3x4=12
2. **खंड–ख :** संपूर्ण पाठ्यक्रम से 5–5 अंको के 4 प्रश्न          5x4=20
3. **खंड–ग :** संपूर्ण पाठ्यक्रम से 12–12 अंको के 4 प्रश्न        12x4=48

### ख. सूरदास :

पाठ्य विषय—भमरगीत, सूरसागर

1. सूरदास का जीवन परिचय एवं साहित्यिक विशेषताएं
2. सूरदास का भमरगीत प्रसंग
3. सूरदास साहित्य में बाल वर्णन
4. व्याख्या— भमरगीत और सूरसागर के निर्धारित पद

### अंक विभाजन

1. **खंड–क :** संपूर्ण पाठ्यक्रम से 3–3 अंको के 4 प्रश्न          3x4=12
2. **खंड–ख :** संपूर्ण पाठ्यक्रम से 5–5 अंको के 4 प्रश्न          5x4=20
3. **खंड–ग :** संपूर्ण पाठ्यक्रम से 12–12 अंको के 4 प्रश्न        12x4=48

## ग. तुलसीदास :

पाठ्य विषय–श्रीरामचरित मानस, विनय पत्रिका, कवितावली

1. तुलसी का जीवन परिचय एवं साहित्यिक विशेषताएं
2. तुलसी की सगुन एवं निर्गुन भक्ति
3. तुलसी का समन्वय दर्शन
4. व्याख्या–श्रीरामचरित मानस, विनयपत्रिका और कवितावली

### अंक विभाजन

1. **खंड–क** : संपूर्ण पाठ्यक्रम से 3–3 अंको के 4 प्रश्न        3x4=12
2. **खंड–ख** : संपूर्ण पाठ्यक्रम से 5–5 अंको के 4 प्रश्न        5x4=20
3. **खंड–ग** : संपूर्ण पाठ्यक्रम से 12–12 अंको के 4 प्रश्न        12x4=48
4. **सहायक ग्रंथ / पुस्तकें :**


## घ. हिंदी उपन्यासकार (मुंशी प्रेमचंद):

पाठ्य विषय– गबन, गोदान, निर्मला, सेवासदन

1. प्रेमचंद का साहित्यिक परिचय
2. हिंदी उपन्यास के विकास में प्रेमचंद का योगदान
3. प्रेमचंद की उपन्यास कला
4. व्याख्या– गबन, गोदान और सेवा सदन

### अंक विभाजन

1. **खंड–क** : संपूर्ण पाठ्यक्रम से 3–3 अंको के 4 प्रश्न        3x4=12
2. **खंड–ख** : संपूर्ण पाठ्यक्रम से 5–5 अंको के 4 प्रश्न        5x4=20
3. **खंड–ग** : संपूर्ण पाठ्यक्रम से 12–12 अंको के 4 प्रश्न        12x4=48
4. **सहायक ग्रंथ / पुस्तकें :**


नाम और हस्ताक्षर : सदस्य पाठ्यक्रम समिति

1......................................        2.....प्रो. रतन आर्य...........

3......................................        4......................................

अर्थशास्त्र
सत्र 2020-21
सेमेस्टर – I
प्रश्नपत्र – पंचम
औद्योगिक अर्थशास्त्र
(Industrial Economics)
PECCT 105

कुल अंक 80
न्यूनतम अंक 16

इकाई–1 औद्योगीकरण की परिभाषा एवं आवश्यकता। औद्योगीकरण की अवस्थायें एवं निर्धारक तत्व। अल्प विकसित देशों में औद्योगिक समस्याएं एवं दूर करने के उपाय। औद्योगिक स्थानीकरण से आशय एवं प्रभावित करने वाले घटक। औद्योगिक स्थानीकरण के सिद्धांत– अल्फ्रेड वेबर एवं सार्जेन्ट फलोरन्स।

इकाई–2 औद्योगिक इकाई अथवा फर्म का आकार, प्रभावित करने वाले घटक, आकार की माप, अनुकूलतम फर्म की अवधारणा। भारत की औद्योगिक नीति 1991 एवं बाजार की नई प्रवृत्तियां– उदारीकरण, निजीकरण एवं भूमण्डलीकरण।

इकाई–3 औद्योगिक वित्त – भारत में औद्योगिक विकास हेतु सुलभ वित्तीय संस्थाएं–आई.डी. बीआई,आई.एफ.सी.,आई.एस.एफ.सी. एवं एस.आई.डी.सी. आदि व्यापारिक बैंकों की भूमिका। उद्योगों में विवेकीकरण से आशय लाभ व हानि। भारत में व्यापारिक बैंक।

इकाई–4 औद्योगिक संघर्ष– कारण, परिणाम एवं दूर करने के उपाय। श्रम कल्याण एवं सामाजिक सुरक्षाएं। भारत के लघु एवं कुटीर उद्योग। छत्तीसगढ़ में उद्योगों का केंद्रीयकरण एवं औद्योगिक विकास की संभावनाएं।

संदर्भ ग्रंथ :–

1. Ahluwalia L.J.(1985), Industrial Growth in India. Oxford Univerdity press, New Delhi.

2. Kuchhai S.C.(1980) Industrial Economy of India (5th Edition), Chaitanya Publishing House , Allahabad.

3. औद्योगिक अर्थशास्त्र– डॉ. कुलश्रेष्ठ लोक भारतीय प्रकाशन इलाहाबाद।

4. औद्योगिक अर्थशास्त्र– डॉ. पी.सी. सिन्हा/पुष्पा सिन्हा नेशनल पब्लिशिंग हाउस इलाहावाद।

5. Barthwal R.R.(1985) Industrial Economics, Weley Ltd. New Delhi.

6. Cherunilam ,F.(1994) Industrial Economics: India Perspective (3Edition) Himalaya Publishing House, Mumbai.

अर्थशास्त्र
सत्र 2020-21
सेमेस्टर – I
वैकल्पिक प्रश्नपत्र – पंचम
कृषि अर्थशास्त्र
(Agriculture Economics)
PECET 106 .

कुल अंक 80
न्यूनतम अंक 16

इकाई – 1 सामान्य परिचय – कृषि अर्थशास्त्र का अर्थ, परिभाषा, क्षेत्र । कृषि तथा आर्थिक विकास। भूमि संसाधन इसका महत्व तथा सीमाएं । फसल प्रणाली – विभिन्न प्रकार – लघु प्रणाली तथा वृहद् प्रणाली । कृषि उत्पादन का मापन (उत्पादता) फसल तथा फसल उत्पादन के तरीके। कृषि प्रणाली ।

इकाई – 2 सिंचाई – अर्थ, स्त्रोत, महत्व तथा सिंचाई के प्रकार । सिंचाई परियोजना, सिंचाई परियोजना हेतु वित्त व्यवस्था। नदी जल विवाद। कृषि हेतु वित्त – कृषि क्षेत्र में पूंजी प्रदाय का तरीका कृषि कर का राजकोषीय दृष्टि से महत्व, कृषि निर्यात तथा आयात। कृषि निर्यात हेतु संस्थागत सहायता।

इकाई – 3 कृषि श्रम – परिभाषा, विशेषताएं, प्रकार, महत्व। कृषि श्रम की मांग तथा पूर्ति। कृषि श्रम का विकास। कृषि श्रम की कार्यक्षमता। न्यूनतम मजदूरी अधिनियम, कृषि मजदूरी की नीतियां।

इकाई – 4 कृषि तकनीक – तकनीक की आधारभूत अवधारणा – कृषि तकनीक अन्तरण । कृषि तकनीक के प्रकार । कृषि तकनीक का कृषि समस्या पर प्रभाव। कृषि क्षेत्र में नवप्रवर्तन का प्रयोग। कृषि मूल्य – कृषि मूल्य हेतु स्थायित्व की आवश्यकता, उद्देश्य एवं नीति कृषि लागत तथा मूल्य हेतु आयोग – कार्य तथा संगठन ।

संदर्भ ग्रंथ :–
1. Baasil P-C." Agricultureal Programmes of India.
2. Bhatnagar O.Pand Desai G.R." Management of Agricultural Extension
3. Benjamin R.E. Harisharan S.V. Karunakaran." Economics of Agriculture.
4. Dhingra I.C" Indian Economic Problem
5. For.Ster-G.W. and Leager MeroC" Elements of Agricultural Economics

C.M.दे.
5-9-20

अर्थशास्त्र
सत्र 2020-21
सेमेस्टर – **II**
प्रश्नपत्र – पंचम
श्रम अर्थशास्त्र
(Labour Economics)
PECCT 2D5

कुल अंक 80
न्यूनतम अंक 16

इकाई–1 श्रम अर्थशास्त्र – परिभाषा, क्षेत्र व महत्व। श्रम बाजार एवं भारत में श्रम बाजार की विशेषताएं, भारत में श्रमिकों की विशेषताएं एवं प्रवासी प्रवृत्ति – कारण व प्रभाव एवं दूर करने के उपाय। श्रमिकों का जीवन स्तर – भारत में श्रमिकों का जीवन स्तर एवं उनकी कार्य कुशलता। श्रम नीति– भारत में श्रम नीति के उद्देश्य, महत्व व विशेषताएं।

इकाई–2 भारतीय उद्योगों में विवेकीकरण। भारत में बेरोजगारी, मजदूरी भुगतान की रीतियां - समयानुसार मजदूरी एवं कार्यानुसार मजदूरी। मजदूरी के सिद्धांत– न्यूनतम मजदूरी नीति, उचित मजदूरी नीति एवं जीवन निर्वाह मजदूरी सिद्धांत।

इकाई–3 भारत में श्रमिक संघ आंदोलन की उत्पत्ति, वर्तमान समस्याएं एवं उन्हे दूर करने के उपाय। सामूहिक सौदेबाजी – भारत में सामूहिक सौदेबाजी की आवश्यकता। औद्योगिक संघर्ष या विवाद–भारत में औद्योगिक संघर्ष के कारण परिणाम एवं दूर करने के उपाय। भारत में बेरोजगारी कारण परिणाम व दूर करने के उपाय।

इकाई–4 भारत में श्रम कल्याण – आशय, महत्व एवं सरकार द्वारा उठाये गये कदम। भारत में सामाजिक सुरक्षा – आशय, विशेषताएं एवं बेहतर बनाने के सुझाव। भारत में बाल एवं महिला श्रमिकों की स्थिति। छत्तीसगढ़ में श्रम पलायन के कारण प्रभाव व रोकने के उपाय।

संदर्भ ग्रंथ :–

1. Hajela.P.D. (1998) Labour Resturchring in India : A Critique of the New Economic Policies, Common wealth publishers,N.Delhi.
2. Papola, T.S.P.P.Ghosh and A.N.Sharma (Eds) (1993) Labour, Employment and Relations in India B.R. Publishing Corporation,New Delhi.
3. वी. सी.सिन्हा–श्रम अर्थशास्त्र
4. श्रम समस्याएं व सामाजिक सुरक्षा–डॉ एस.सी.सेक्सना।

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अर्थशास्त्र
सत्र 2020-21
सेमेस्टर – II
वैकल्पिक प्रश्नपत्र – पंचम
ग्रामीण सहकारिता
(Rural Co-operation)
PECET 206

कुल अंक 80
न्यूनतम अंक 16

इकाई – 1 सहकारिता – उतपत्ति, उद्देश्य तथा विकास । सहकारिता का अर्थ तथा विशेषताएं। सहकारिता के सिद्धांत अर्थ तथा विभिन्न घटक। भारत में सहकारिता का इतिहास तथा विकास।

इकाई – 2 पंचवर्षीय योजना में सहकारिता की प्रगति। ग्रामीण साख तथा सहकारिता। कृषि साख समितियां, उद्देश्य, इतिहास, संगठन तथा पंजीयन। कृषि साख समितियों का कार्य क्षेत्र तथा उनकी जिम्मेदारियां। कृषि साख समितियों की वित्तीय स्थिति तथा उसमें वाणिज्यिक बैंको का योगदान।

इकाई – 3 कृषि क्षेत्र की बहुउद्देश्य सहकारी समितियां – बड़े आकार की समितियां – प्राथमिक समिति की प्रगति, कृषक सेवा समितियों की कार्यप्रणाली । बैंको का आकार तथा कार्य क्षेत्र, कार्यप्रणाली । केन्द्रीय सहकारी बैंको की कठिनाईयां तथा कार्य प्रणाली में सुधार के सुझाव।

इकाई – 4 भूमि विकास बैंक – आवश्यकता, वर्गीकरण । भारत में भूमि विकास बैंक का विस्तार। राज्य सहकारी बैंक– आवश्यकता तथा कार्य। राज्य सहकारी बैंक की कार्यशील पूंजी के स्त्रोत, राज्य सहकारी बैंक का प्रबंध, सहकारी क्षेत्र के बैंको का प्रबंधन ।

संदर्भ ग्रंथ :–

1. Co-operation                                          -      B.S.Mathur
2  Rural Development in India                  -      Dr. D.C.Pant
3. Economic Development in India          -      C.B.Mamaoria
4. Industrial Economics                            -      V.C.Sinha
5. Agriculture Co-Operation Marketing Rural Development -  Agrawal & Jain
6. Rural development                               -      I.Satya Sundram
7. Rural Finance                                       -      Bhagirath & Singh
8. Indian Economics                                -      A.N. Sachdeva Basu

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# चतुर्थ प्रश्न पत्र (अ) – पर्यटन सिद्धांत एवं व्यवहार

**इकाई –1.**

1. पर्यटन का अर्थ, परिभाषा एवम् पर्यटन के प्रकार
2. ट्रेवल ऐजेन्सी – कार्य एवम् पद्धति, टूरिस्ट गाइड
3. पर्यटन – यातायात उद्योग एवम् आवास उद्योग
4. पर्यटन – विपणन

**इकाई –2.**

5. भारत के प्रमुख धार्मिक पर्यटन स्थल – वाराणसी, गया, अमृतसर, तंजौर
6. भारत के प्रमुख ऐतिहासिक पर्यटन स्थल – आगरा, महाबल्लीपुरम्, हाम्पी, कोणार्क
7. भारत के प्रमुख पर्वतीय पर्यटन स्थल – अमरकंटक, डलहौजी, गुलमर्ग– पहलगांव,ऊटी
8. भारत के प्रमुख समुदतटीय स्थल – पुरी, पणजी, कन्या कुमारी, कोचीन

**इकाई–3.**

9. भारत के प्रमुख राष्ट्रीय उद्यान – गिरी राष्ट्रीय उद्यान, कांजीरंगा राष्ट्रीय उद्यान,
10. जिम कोर्बेट राष्ट्रीय उद्यानं, कान्हा किसली राष्ट्रीय उद्यान
11. भारत के प्रमुख पक्षी उद्यान – चिलका लेक,भरतपुर पक्षी अभ्यारण्य,जल सरोवर पक्षी अम्यारणम्, कुमारकम
12. भारत के द्वीपीय पर्यटन स्थल – अण्डमान–निकोबार, लक्ष्यद्वीप मिनीकोय
13. उत्तरी पूर्वी भारत की आदिवासी संस्कृति – सिक्किम, नागालैझड, मणिपुर, असम

**इकाई–4.**

14. छ.ग. के प्रमुख ऐतिहासिक पर्यटन केन्द्र –सिरपुर, राजिम, चम्पारण, रामगिरी (सरगुजा)
15. छ.ग. के प्रमुख धार्मिक पर्यटन केन्द्र – भोरमदेव, रतनपुर, डोंगरगढ़, दंतेवाड़ा
16. छ.ग. की आदिवासी संस्कृति के केन्द्र – उत्तरी छत्तीसगढ़ (सरगुजा), दक्षिण छत्तीसगढ़ (बस्तर)
17. छ.ग. के प्रमुख त्यौहार और मेले

## अनुशंसित ग्रंथसूची

1. सुरजीत सिंह – पर्यटन के सिद्धांत
2. इमरान रिज़वी – तीर्थ एवं पर्यटन स्थल
3. राजकरन यादव – सम्पूर्ण भारत के सांस्कृतिक एवं धार्मिक पर्यटन स्थल
4. डॉ. सुरेश तिवारी – बस्तर– पर्यटन, इतिहास और संस्कृति
5. डॉ. शिवस्वरूप सहाय – पर्यटन–'सिद्धांत और प्रबंधन तथा भारत में पर्यटन
6. सुरजीत सिंह – मानव संसाधन एवं पर्यटन प्रबंधन

29/7/19

24-7-19   24/07/19

# एम.ए.इतिहास एम.ए.सेमेस्टर – I (वैकल्पिक)
## पंचम प्रश्न पत्र (ब) – ग्रेट ब्रिटेन का इतिहास (1815 से 1885)

**इकाई–1.**

1. 1815 से 1822 तक आंतरिक समस्याएं
2. 1822 से 1830 तक इंग्लैंड की आंतरिक स्थिति
3. कैसलरे की विदेश नीति
4. कैनिंग की विदेश नीति

**इकाई–2.**

5. ब्रिटेन में उदारवाद का उदय
6. ब्रिटेन में उदारवाद के विकास का कारण
7. 1832 का सुधार अधिनियम
8. 1830 से 1841 तक अन्य सुधार

**इकाई–3.**

9. चार्टिस्ट आंदोलन
10. ग्रेट ब्रिटेन की विदेश नीति (1830–1841)
11. सर राबर्ट पील
12. लार्ड जॉन रसेल

**इकाई–4.**

13. लार्ड पामरस्टर्न
14. 1867 का सुधार अधिनियम
15. बेंजामिन डिजरैली – विदेश नीति
16. नवीन टोरीवाद

## अनुशंसित ग्रंथसूची

1. एल.पी. शर्मा    – इंग्लैंड का इतिहास
2. विद्याधर महाजन  – इंग्लैंड का इतिहास
3. J.A.R.Marriott  -  Modern England
4. G.M.Trevelyan  -  Social History of England
5. Ramsay Muir  -  History of England
6. विपीन बिहारी सिन्हा  – आधुनिक ग्रेट ब्रिटेन
7. मेरियट    – आधुनिक इंग्लैंड का इतिहास
8. रामकिशोर पाण्डेय  – आधुनिक इंग्लैंड का इतिहास

# एम.ए.इतिहास सेमेस्टर – II
## नवम् प्रश्न पत्र – पर्यटन सिद्धांत एवं व्यवहार

**इकाई –1**
1. विश्व पर्यटन संगठन
2. भारतीय केन्द्रीय पर्यटन संगठन
3. छत्तीसगढ़ पर्यटन विभाग एवम् संगठन तथा सरकार की पर्यटन प्रोत्साहन योजनायें
4. अंतर्राष्ट्रीय पर्यटन के प्रमुख तत्व – पासपोर्ट, वीजा, विदेशी मुद्रा विनिमय संबंधी नियम

**इकाई–2**
1. पर्यटन एवम् लोक संस्कृति
2. स्मारक एवम् संग्रहालय
3. भारत महोत्सव एवम् अनतर्देशीय महोत्सवों का पर्यटन मे योगदान
4. चिकित्सा पर्यटन

**इकाई–3**
1. पर्यटन के विकास हेतु शासकीय योजनाऐं का योगदान
2. पर्यटन के विकास मैं प्रौद्योगिकी की भूमिका
3. पर्यटन के विकास मे संचार साधनों का योगदान
4. पर्यटन के विकास में भारतीय रेलवे का योगदान

**इकाई–4**
1. अर्न्तराष्ट्रीय ऐतिहासिक पर्यटन केन्द्र–रोम, मिस्र, एथेंन्स
2. अर्न्तराष्ट्रीय प्राकृतिक पर्यटन केन्द्र – स्वीटजरलैण्ड, दक्षिण अफ्रीका, नेपाल
3. अर्न्तराष्ट्रीय धार्मिक पर्यटन केन्द्र – जेरुसलेम, मक्का – मदीना, तिब्बत
4. अर्न्तराष्ट्रीय प्रायद्वीपीय प्रर्यटन केन्द्र – लंदन, मारिशस, श्रीलंका

## अनुशंसित ग्रंथसूची

1. सुरजीत सिंह – पर्यटन के सिद्धांत
2. इमरान रिज़वी – तीर्थ एवं पर्यटन स्थल
3. राजकरन यादव – सम्पूर्ण भारत के सांस्कृतिक एवं धार्मिक पर्यटन स्थल
4. डॉ. सुरेश तिवारी – बस्तर– पर्यटन, इतिहास और संस्कृति
5. डॉ. शिवस्वरूप सहाय – पर्यटन–'सिद्धांत और प्रबंधन तथा भारत में पर्यटन
6. सुरजीत सिंह – मानव संसाधन एवं पर्यटन प्रबन्धन

# एम.ए.इतिहास सेमेस्टर – II (वैकल्पिक)
## दशम् प्रश्न पत्र – आधुनिक इंग्लैड (1885 से 1956)

**इकाई –1**

1. ग्लैडस्टन – आयरिश नीति
2. ग्लैडस्टन – गृह नीति
3. सेलिसबरी – गृह नीति
4. सेलिसबरी – विदेश नीति

**इकाई –2**

5. चेम्बरलेन का साम्राज्यवाद
6. 1911 का सुधार अधिनियम
7. इंग्लैंड की गृह नीति (1902–1914)
8. इंग्लैंड की विदेश नीति (1902–1914)

**इकाई –3**

9. इंग्लैंड और पूर्वी समस्या (1878–1914)
10. प्रथम विश्व युद्ध मे इंग्लैंड की भूमिका
11. दो विश्व युद्धों के बीच इंग्लैंड
12. विश्व आर्थिक मंदी और इंग्लैंड

**इकाई –4**

13. अफ्रीका के विभाजन में इंग्लैंड की भूमिक
14. ग्रेट ब्रिटेन की गृह नीति (1919–1939)
15. ग्रेट ब्रिटेन की विदेश नीति (1919–1935)
16. चेम्बरलेन की तुष्टीकरण की नीति (1936–1939)

## अनुशंसित ग्रंथसूची

1. एल.पी.शर्मा – इंग्लैंड का इतिहास
2. विद्याधर महाजन – इंग्लैंड का इतिहास
3. J.A.R. Marriott - Modern England
4. G.M. Trevelyan - Social History of England
5. अरूण कुमार मित्तल – इंग्लैंड का इतिहास
6. रमेश चंद्र सिन्हा – इंग्लैंड का इतिहास
7. Ramsay Muir - History of England
8. विपिन बिहारी सिन्हा – इंग्लैंड का इतिहास

## PAPER - XIII
## Research Methodology
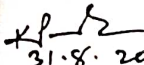
**Max. Marks End Semester : 80**
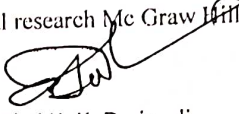
**Unit I :** Nature and Scope of **Research Methodology.** Scientific Research: Procedure and Charcteristics. Research Problem. Research Design.

Hypothesis – Formulation and Types.

**Unit II :** Methods of Data Collection- Observation, Questionnaire, Schedule and Interview. Sampling – Methods and Types.

**Unit III :** Measures of Dispersion: Mean Deviation, Standard Deviation and Coefficient of Variation.

Correlation: Types ,Product Moment, Rank Correlation and Carl Pearson's Coefficient of Correlation. Linear Regression.

**Unit IV :** Data- Processing and Analysis: Coding, Classification, Tabulation and Analysis. Preparation of Research Report- Types and Steps.

**RECOMMENDED READINGS -**

1. Selltiz, C. M. Jahoda, M.Deutsch – Research method in social relation, holt, New York 1961.
2. Goode, W and P.K. Hatt – Method in social research Mc Graw Hill, Tokyo, 1962.

31·8· 2020
Dr. K. N. Prasad          Dr. T. L. Verma          Shri K. K. Dwivedi          Dr. S. K. Das

31·8·20
Dr. A. K. Mishra          Dr. S. Jenamani          Ku. Tameshwari Sahu          Shri Basant Bahekar
31·8

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## PAPER - XIV

## BIO-GEOGRAPHY

Max. Marks End Semester :80

**Unit I :** Definition and Scope of Bio-Geography. Habitat and Types. Plants-Animal Association. Biome and its Types - Equatorial Rain Forest, Desert, Terrestrial, Aquatic and Grassland (Tropical and Temperate).

**Unit II :** Elements of Plant Geography. Distribution of Forests and Communities. Plant Successions in Newly Formed Landforms.

Zoo-Geography:

**Unit III :** Ecosystem: Components and Function, Tropic level, Ecological Pyramids. Ecological Niche, Energy and Nutrients in Ecosystem.

Food Chain and Food Webs.

**Unit IV :** Man – Environment Relationship: Resource use and Ecological Imbalance with reference to soil, Forest and energy resource. Biodiversity and Its Conservation of the Ecosystems through Resource Management.

Environment Legislation: The stockhom Conference and the Earth Summit. Environment Laws in India ( the wild life act. Water Act., Environment Protection Act and National Environment Tribunal Act.)

### Suggested Readings -

1. Chandana, R.C. 1998 : Environment Awareness, Klyani Publication, New Delhi.
2. Simmons. I.D. 1981 :  Ecology to Natural Resources, Edward Arnold, London.
3. लक्ष्मीचंद अग्रवाल : जैव भूगोल।
4. होता : जैव भूगोल एवं पारिस्थितिकी।
5. वी. पी. राव : पर्यावरण एवं पारिस्थितिकी।
6. डॉ. विजय तिवारी : पर्यावरण अध्ययन, हिमालय पब्लिकेशन, मुम्बई।
7. डॉ. विजय तिवारी : पर्यावरण एवं पारिस्थितिकी, हिमालय पब्लिकेशन, मुम्बई।
8. डॉ. विजय तिवारी : पर्यावरण प्रदूषण अध्ययन, हिमालय पब्लिकेशन, मुम्बई।
9. AGRAWAL, D.P.  : Man and Environment in India, through ages. Books & Books, 1992.
10. Cox. C.D. and Moore, P.D. : Biogeography; an ecology and evolutionary approach 5th edn. Bacwell, 1993.
11. Huggett, R.J. : Fundamental of Bbiogeography, Routledge, USA,1998.

Dr. K. N. Prasad      31.8.2020

Dr. T. L. Verma

Shri K. K. Dwivedi

Dr. S. K. Das

Dr. A. K. Mishra      31-8-20

Dr. S. Janamani      31-8

Ku. Tameshwari Sahu

Shri Basant Bahekar

19

# Govt. Digvijay Autonomous P G College, Rajnandgaon.
## M.A. ENGLISH LITERATURE
## SYLLABUS 2020-21
## SEMESTER-I

Paper - I

MaximumMarks-80

Name of the Paper- POETRY- I

Minimummarks-16

Number of Units- IV

| UNIT - I | Geoffrey Chaucer | : | Prologue to Canterbury Tales | (Detailed) |
|---|---|---|---|---|
| UNIT –II | John Donne | : | Death Be Not Proud<br>A Valediction: Forbidding Mourning<br>Sunne-Rising<br>The Extasie | (Detailed) |
| | William Shakespeare | : | Sonnet No: 1,18,26,54,60,116 | (Non-Detailed) |
| UNIT –III | John Milton | : | Paradise Lost- Book I | (Detailed) |
| | John Dryden | : | Mac Flecknoe | (Non-Detailed) |
| UNIT –IV | Alexander Pope | : | The Rape of the Lock | (Detailed) |
| | William Blake | : | The Tyger, Sunflower | (Non-Detailed) |

DIRECTIVES:
1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus. of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

## APPROVED BY THE BOARD OF STUDIES ON ...03..09.2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anit |
| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual consent received. |
| Dr.Ghanshyam | Subject Expert (Principal Nominee) | |
| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

# Recommended Reading

| | | | |
|---|---|---|---|
| 1. | Tillyard | : | Milton |
| 2. | C.M. Bowra | : | From Virgil to Milton |
| 3. | B. Rajan | : | Paradise Lost and 17th Century Reader |
| 4. | Ifor Evans | : | A Short History of English Literature |
| 5. | Bradley | : | Oxford Lectures on Poetry |
| 6. | C.S. Lewis | : | A Preface to Paradise Lost |
| 7. | Mark Van Doren | : | John Dryden |
| 8. | Tillotson | : | On the Poetry of Pope |
| 9. | M. Mack | : | Pope and his Contemporaries |
| 10. | Walter Jackson Bate | : | From Classic to Romantic |
| 11. | R.A. Scott James | : | The Making of Literature |
| 12. | Sengupta | : | The Poems of John Donne |
| 13. | Edward Albert | : | A Short History of English Literature |
| 14. | P. Gurrey | : | The Appreciation of Poetry |
| 15. | Robert Penn (Ed.) Warren & Albert Erskine | : | Six Centuries of Great Poetry |
| 16. | P. Gurrey | : | The Appreciation of Poetry |
| 17. | Boris Ford (Ed.) | : | A Guide to English Literature (Seven Volumes |

# M.A. ENGLISH LITERATURE
## SYLLABUS 2020-21
### SEMESTER-I

Paper - II
Name of the Paper- Drama- I
Number of Units- IV

Maximum Marks 80
Minimum marks 16

| UNIT – I | Christopher Marlowe : | Doctor Faustus | (Detailed) |
|---|---|---|---|
| UNIT –II | John Webster : | The Duchess of Malfi | (Detailed) |
| | Ben Johnson : | The Alchemist | (Non Detailed) |
| UNIT –III | William Shakespeare : | Hamlet | (Detailed) |
| | | Macbeth | (Non Detailed) |
| UNIT –IV | William Shakespeare : | Tempest | (Detailed) |
| | : | As you like it | (Non Detailed) |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Ques.of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed non-detailed works with internal choice.

**APPROVED BY THE BOARD OF STUDIES ON** 03.09.2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual Consent received. |
| Dr.Ghanshyam | Subject Expert (Principal Nominee) | |
| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

# Recommended Reading

| | | | |
|---|---|---|---|
| 1. | A.C. Bradley | : | Shakespearean Tragedy |
| 2. | G. Wilson Knight | : | The Essential Shakespeare |
| 3. | Boas | : | Marlowe |
| 4. | Clough Douglas | : | Evil and Suffering in the Play |
| 5. | A.L. Williams (Ed.) | : | Twentieth Century Interpretations of the works of Marlowe |
| 6. | Nicoll | : | Theory of Drama |
| 7. | Marjouri Boulton | : | Anatomy of Drama |
| 8. | Compton-Rickett | : | History of English Literature |
| 9. | Wilson Knight | : | Wheels of Fire |

# M.A. ENGLISH LITERATURE
## SYLLABUS 2020-21
### SEMESTER-I

Paper - III

Maximum Marks-80

Name of the Paper- Prose- I

Minimum marks-16

Number of Units- IV

| | | | | |
|---|---|---|---|---|
| UNIT – I | Francis Bacon | : | Of Friendship | |
| | | | Of Truth | |
| | | | Of Revenge | |
| | | | Of Great Place | (Detailed) |
| UNIT –II | Thomas Browne | : | Urn Burial | (Non Detailed) |
| | John Milton | : | Areopagitica. | (Detailed) |
| UNIT-III | Joseph Addison | : | Sir Roger at Home | |
| | | | Sir Roger at Church | |
| | | | Female Orators | (Detailed) |
| | James Boswell | : | Life of Doctor Johnson | (Non Detailed) |
| UNIT –IV | Montaigne | : | (Florio's Translation) Of Idlenesse, | |
| | | | Of Readie or Slow Speech, | |
| | | | That We Should not Judge of Our | |
| | | | Happinesse Until After Our Death | (Detailed) |
| | Ruosseau | : | Confession | (Non Detailed) |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus. of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

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| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual consent received |
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| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

## Recommended Reading

1. Sukanta Chowdhary : Bacon's Essays
2. Hugh Walker : English Essays and Essayists
3. Dobre : English Prose Style
4. Smithens : Life of Joseph Addison
5. B. Prasad : An Introduction of the Study of Literature
6. Montaigne : Florio's Translation
7. W.H. Hudson : An Outline History of English Literature
8. Oxford's World Literature in Digest Form

# M.A. ENGLISH LITERATURE
## SYLLABUS 2020-21
## SEMESTER-I

**Maximum Marks-80**
**Minimum marks-16**

Paper - IV
Name of the Paper- Fiction- I
Number of Units- IV

| UNIT – I | John Bunyan | : | The Pilgrim`s Progress. | (Detailed) |
| | Daniel Defoe | : | Robinson Crusoe | (Non-detailed) |
| | | | | |
| UNIT – II | Henry Fielding | : | Joseph Andrews. | (Detailed) |
| | Oliver Goldsmith | : | The Vikar of Wakefield | (Non-detailed) |
| | | | | |
| UNIT –III | Sir Walter Scott | : | Ivanhoe | (Non-detailed) |
| | Jane Austen | : | Pride and Prejudice. | (Detailed) |
| | | | | |
| UNIT –IV | Charles Dickens | : | Great Expectations. | (Non-detailed) |
| | Emily Bronte | : | Wuthering Heights. | (Detailed) |

**DIRECTIVES: -** 1. Candidates are expected to study the entire prescribed syllabus thoroughly.

2. Each unit is compulsory.

3. Question paper will consist of very short answer, short answer and descriptive questions.

4. Very short answer questions will be asked from detailed works of all Units.( 6 Qus of 2 marks=12)

5. Short answer questions will be asked from detailed works of all units. (4 Qus of 5 marks=20).

6. Candidates will answer four descriptive questions from unit I to IV, carrying 12 marks each. (4 Qus of 12=48)

7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

## APPROVED BY THE BOARD OF STUDIES ON ...03.09.2020

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|---|---|---|
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| Dr.Mercy George | Subject Expert (V C Nominee) | |
| Dr.Ghanshyam | Subject Expert (Principal Nominee) | Virtual consen. received |
| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

## Recommended Reading

1. M. Bruce : Representative English Novels
2. K. Arnold : An Introduction to English Novel Vol. I & II
3. Beach J. Warren : The Technique of Thomas Hardy
4. Edwin Muir : The Structure of the Novel
5. Walter Allen : The English Novel
6. David Cecil : Hardy- The Novelist

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-I

Paper - V

Maximum Marks-80

Name of the Paper-History of English literature-I(1350-1700)    Minimum marks-16

Number of Units- IV

**Unit I - The Age of Chaucer (1350-1400) & The Fifteenth Century (1400-1485)**
1. Development of poetry in the age of Chaucer.
2. Development of prose during the age of Chaucer.
3. Chaucer as Father of English Poetry.
4. The Poetic trends of the Fifteenth Century.

**Unit II - The Age of Shakespeare (1558-1625)**
1. The Renaissance and its influence on Elizabethan Literature.
2. University wits and their contribution to the Pre-Shakespearean Drama.
3. Elizabethan sonnets & sonneteers.
4. Development of English prose during the latter half of the 16th century.

**Unit III - The Age of Milton (1625-1660)**
1. The Puritan Movement in the age of Milton.
2. The Metaphysical poetry and the poets.
3. Cavalier poetry and the Cavalier poets.
4. Development of Prose during the age of Milton.

**Unit IV - The Restoration Period (1660-1700)**
1. Social, Political and Literary tendencies of the age.
2. Restoration Satire and Satirists.
3. The comedy of manners and the dramatists of this school.
4. Restoration prose

**DIRECTIVES:**
1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from all Units. (6 Qus of 2 marks=12)
5. Short answer questions will be asked from all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from unit I to IV, carrying 12 marks each. (4 Qus of 12=48)

## APPROVED BY THE BOARD OF STUDIES ON ...03.09.2020

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|---|---|---|
| Dr. Anita Shankar | Chairman | ANIS |
| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual consent received |
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| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

## Recommended Reading

| | | | |
|---|---|---|---|
| 1. | W.H. Husdon | : | An Outline History of English Literature |
| 2. | Compton-Rickett | : | A History of English Literature |
| 3. | Ifor Evans | : | A Short History of English Literature |
| 4. | Edward Albert | : | A Short History of English Literature |
| 5. | Emile Legouis | : | A Short History of English Literature |
| 6. | Emile Legouis & Louis Cazamian | : | A History of English Literature |
| 7. | B. Prasad | : | A Short History of English Poetry |
| 8. | B.P. Bagchi | : | Pages From the History of English Literature |

Maximum Marks-80
Minimum marks-16

Paper - I
Name of the Paper- Poetry II
Number of Units- IV

| UNIT – I | Thomas Gray | : | Elegy written in a country churchyard. (Detailed) |
| | William Collins | : | Ode to evening. (Non Detailed) |
| UNIT –II | William Wordsworth | : | (a) Immortality Ode. |
| | | | (b) Tintern Abbey (Detailed) |
| | S.T. Coleridge | : | (a) Dejection: An Ode |
| | | | (b) Kubla Khan (Non Detailed) |
| UNIT –III | P.B. Shelley | : | (a) Ode to the West Wind. |
| | | | (b) To a Skylark (Non Detailed) |
| | John Keats | : | (a) Ode to Autumn |
| | | : | (b) Ode to a Nightingale |
| | | : | (c) Grecian Urn. (Detailed) |
| UNIT –IV | Tennyson | : | (a) Lotus Eaters. |
| | | : | (b) Ulysses (Non Detailed) |
| | Browning | : | (a) My Last Duchess |
| | | | (b) The last Ride Together |
| | | | (c) Prospice (Detailed) |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus.of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

APPROVED BY THE BOARD OF STUDIES ON ...03.09.2020...

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
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| Dr.Mercy George | Subject Expert (V C Nominee) | virtual consent received |
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| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

## Recommended Reading

1. Oxford's Fifteen Poets
2. Basis Welley : The Eighteenth Century Background
3. J. Jackson : Collected Coleridge
4. Graham Hough : The Romantic Poets
5. Herbert Read : The True Voice of Feelings: Studies in English Romantic Poetry
6. John Spencer Hill : The Romantic Imagination
7. F.R. Leavis : Revaluation: Tradition and Development in English Poetry

## M.A. ENGLISH LITERATURE
### Syllabus 2020-2021
### SEMESTER-II

**Maximum Marks-80**

**Minimum marks-16**

Paper - II

Name of the Paper- Drama - II

Number of Units- IV

| UNIT –I | William Congreve | : | The Way of the World | (Detailed) |
| | Oliver Goldsmith | : | She Stoops to Conquer | (Non Detailed) |
| UNIT –II | James Synge | : | Riders to the Sea. | (Non Detailed) |
| | G. B. Shaw | : | Arms and the Man | (Detailed) |
| UNIT –III | T.S. Eliot | : | Murder in the Cathedral. | (Detailed) |
| | John Osborne | : | Look Back in Anger | (Non- Detailed) |
| UNIT –IV | Ibsen | : | A Doll`s House. | (Detailed) |
| | Chekhov | : | The Cherry Orchard | (Non- Detailed) |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus. of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

**APPROVED BY THE BOARD OF STUDIES ON** 03.09. 2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | ANil |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual consent received. |
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| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

# Recommended Reading

1.  J. L. Styon          :    Modern Drama in Theory and Practice
2.  Nicoll               :    Theory of Drama
3.  John Russell Browne  :    Modern British Dramatists: A Collection of Critical
                              Essays
4.  Martin Esslin        :    The Theater of the Absurd
5.  Martin Esslin        :    Absurd Drama
6.  Ibsen's Doll's House Special Introduction by Ezekiel

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-II

Paper - III

Name of the Paper- Prose- II

Number of Units- IV

Maximum Marks-80

Minimum marks-16

| | | | | |
|---|---|---|---|---|
| UNIT - I | Charles Lamb | : | (a) Dream children | (Detailed) |
| | | | (b) Bachelor's Complaint | |
| | | | (c) Dissertation upon a Roasted Pig | |
| | William Hazlitt | : | (a) On Actors and Acting | (Non Detailed) |
| | | | (b) Ignorance of the learned | |
| UNIT – II | T. Carlyle | : | (a) Hero as a Poet. | (Detailed) |
| | J. Ruskin | : | (a) Sesame & Lilies | (Non Detailed) |
| UNIT –III | A.G. Gardiner | : | (a) On Saying Please. | |
| | | | (b) On Waking up. | (Detailed) |
| | Chesterton | : | (a) On Running After one's Hat. | |
| | | : | (b) Patriotism and Sport. | (Non-Detailed) |
| UNIT –IV | Hillaire Belloc | : | (a) A Conversation with a Cat | |
| | | | (b) On Preserving English | (Detailed) |
| | Robert Lynd | : | (a) On Forgetting. | |
| | | | (b) The Pleasure of Ignorance. | (Non Detailed) |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - III (6 Qus. of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

APPROVED BY THE BOARD OF STUDIES ON ...0.3...0.9. 2020

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|---|---|---|
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| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

1. Hugh Walker : English Essays and Essayists
2. MacMillan Edition : Art of the Essayist
3. Dobre : English Prose Style
4. Prakash Book Depot (Pub.) : Masters of English Prose

## M.A. ENGLISH LITERATURE
### Syllabus 2020-2021
### SEMESTER-II

Paper - IV
Marks-80
Name of the Paper- Fiction- II
marks-16
Number of Units- IV

Maximum

Minimum

| UNIT – I | James Joyce | : Portrait of the Artist as a young man.(Non-detailed) |
| | Virginia Woolf | : Mrs. Dalloway. (Detailed) |
| UNIT –II | D.H. Lawrence | : Sons and Lovers. (Non-detailed) |
| | E.M. Forster | : A Passage to India. (Detailed) |
| UNIT –III | Graham Greene | : Power and the Glory. (Non-detailed) |
| | Golding | : Lord of the Flies. (Detailed) |
| UNIT –IV | Gustave Flaubert | : Madam Bovary (Detailed) |
| | Dostovesky | : Crime and Punishment (Non-detailed) |

**DIRECTIVES:**
1.Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of all Units. (6 Qus of 2 marks=12)
5. Short answer questions will be asked from all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from unit II to V, carrying 12 marks each. (4 Qus of 12=48)
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

**APPROVED BY THE BOARD OF STUDIES ON** 03.09.2020

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## Recommended Reading

1. Malcolm Bradburry : The Modern British Novel
2. M. Bruce : Representative English Novels
3. Casebook Series : D.H. Lawrence, E.M. Forster, Virginia Woolf
4. J.W. Beach : Twentieth Century Novel
5. E.A. Baker : The History of English Novel Vol. IX

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
### SEMESTER-II

Paper - V

Name of the Paper- History of English Literature-II(1700-1950)

Number of Units- IV

Maximum Marks-80
Minimum marks-16

## Unit I - The Age of Pope (1700-1750)

1. 18th Century as an age of Prose & Reason,
2. The growth of the 'Periodical Essays' and the causes of its popularity,
3. Coverley Papers' as the first sketch of the English Novel.

### The Age of Dr. Johnson (1750-1798)

1. Salient features of the poetry of the 'Age of Transition',
2. The precursors of the 'Romantic
3. Revival' or the poets of Revolt,
4. The French Revolution and its influence on English Literature,
5. The 'Four Wheels' of the novel of the 18th Century

## Unit II - The Age of Romanticism (1798-1832)

1. Characteristics of 'Romanticism',
2. The Romantic Movement as 'The Renaissance of the Wonder',
3. Prose of the age of Romanticism,
4. Novel of the age of Romanticism.

## Unit III - The Victorian Age (1832-1887)

1. Salient features of Victorian Poetry,
2. The Spasmodic School of Poetry,
3. The Pre- Raphaelite Movement in English Poetry and its chief, exponents, The Oxford movement
4. Victorian novels and the novelists, Women novelists of the Victorian era

## Unit IV - The Modern Age I (1890-1950)

1. General characteristics of the age,
2. Poetry:
   a. The Transitional Poets (Robert Bridges, Hopkins, Yeats)
   b. The Georgian Poets
   c. The War Poets
   d. The Imagist Movement and its exponents
   e. The Neo-metaphysical
3. The English essays and essayists during the 20th century
4. Drama in the 20th century
   a. The Expressionistic School of Drama
   b. The Problem Play of the 20th century
   c. The Poetic Drama and Dramatists
   d. The Theatre of the absurd
   Characteristic features of the poetry of this age,
5. The Stream of Consciousness Novel

**DIRECTIVES:** 1.Candidates are expected to study the entire prescribed syllabus thoroughly.

2. Each unit is compulsory.

3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from all Units. (6 Qus of 2 marks=12)
5. Short answer questions will be asked from all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from unit II to V, carrying 12 marks each. (4 Qus of 12=48)

**APPROVED BY THE BOARD OF STUDIES ON** 03.09 - 2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | Virtual Consen. received |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

1. W.H. Husdon : An Outline History of English Literature
2. Compton-Rickett : A History of English Literature
3. Ifor Evans : A Short History of English Literature
4. Edward Albert : A Short History of English Literature
5. Emile Legouis : A Short History of English Literature
6. Emile Legouis & Louis Cazamian : A History of English Literature
7. B. Prasad : A Short History of English Poetry
8. B.P. Bagchi : Pages From the History of English Literature

## M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-III

Maximum Marks-80
Minimum marks-16

Paper - I
Name of the Paper- Critical Theory-I
Number of Units- IV

| UNIT -I | Aristotle<br>Longinus | : <br> : | Poetics<br>On the Sublime. | (Detailed)<br>(Non Detailed) |
| UNIT -II | John Dryden<br>Sydney | : <br> : | An Essay on Dramatic Poesy.<br>An Apology for Poetry. | (Detailed)<br>(Non Detailed) |
| UNIT -III | Wordsworth<br>Coleridge | : <br> : | Preface to the Lyrical Ballads<br>Biographia Literaria (13-17) | (Detailed)<br>(Non Detailed) |
| UNIT -IV | P.B. Shelley<br>Matthew Arnold | : <br> : | A Defence of Poetry<br>The Function of Criticism at the Present Time | (Non-detailed) |

(Detailed)

**DIRECTIVES:**     1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptie questions.
4. Very short answer questions will be asked from detailed works of all Units. (6 Qus. of 2 marks=12)
5. Short answer questions will be asked from detailed works of all units. (4 Qus. of 5 marks=20).
6. Candidates will answer four descriptive questions from unit II to V, carrying 12 marks each. (4 Qus. of 12=48)
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

**APPROVED BY THE BOARD OF STUDIES ON** .......03. 09. 2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|------|--------------------|-----------|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual consent received |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

# Recommended Reading

1. Brooks. Cleanth          : Irony as a Principle of Structure
2. Brooks. Cleanth          : The Making of Literature
3. Seldon. Roman (ed.)      : The Theory of Criticism from Plato to the Present
4. Dalton. John             : From Literary Theory and Criticism. London,
                               Longman Green & Co. 1931
5. Eliot. T.S.              : The Use of Poetry and the use of Criticism
6. Daiches. David           : Critical Approach to Literature (London, 1964)
7. M.H. Abrams              : The Mirror and the Lamp Romantic Theory and
                               the Critical Tradition
8. George Saintsbury        : A History of Criticism & Literary taste in Europe
9. Wimsatt W.K.             : Literary Criticism Cleanth Brooks
10. Butcher (ed.)            : Aristotle's Poetics
11. J.W.H. Atkins            : English Literary Criticism 17th and 18th Centuries

## M.A. ENGLISH LITERATURE
### Syllabus 2020-2021
### SEMESTER-III

Paper - II

Name of the Paper- Indian Writing in English-1

Maximum Marks-80

Minimum marks-16

Number of Units- IV

UNIT - I  Toru Dutt          : Our Casuarina Tree          (Non Detailed)
                               Savitri
                               The Lotus

          Rabindra Nath Tagore  : Gitanjali (1-15 Poems)    (Detailed)

UNIT –II  Kamla Das          : The Freaks, A Hot Noon in Malabar (Non Detailed)
                               The Looking Glass,
                               The Sunshine Cat

          Nissim Ezekiel     :    Enterprise, Poet, Lover & Bird Watcher,
                                  Night of Scorpion       (Detailed)

UNIT-III  M. K. Gandhi       :    My Experiments with Truth    (Non Detailed)
          Jawaharlal Nehru   :    Discovery of India          (Detailed)

UNIT-IV   Mulk Raj Anand     :    The Untouchable.    (Non Detailed)
          R.K.Narayan        :    The Guide.          (Detailed)

DIRECTIVES:  1.   Candidates are expected to study the entire prescribed syllabus
                  thoroughly.
             2.   Each unit is compulsory.
             3.   Question paper will consist of very short answer, short answer and
                  descriptive questions.
             4.   Very short answer questions will be asked from detailed works of
                  Unit I - IV (6 Qus.of 2 marks
             5.   For short answers, four passages will be given for annotation from
                  detailed works of unit I & II out of which two are to be attempted and four
                  short notes will be  asked from detailed works of unit III & IV, out of which
                  two are to be attempted. (2
                      annotations x 5 marks + 2 short notes x 5 marks = 20)
             6.   Candidates will answer 4 descriptive questions from unit I to IV,
                  carrying 12 marks each=48.
             7.   Descriptive questions (Long Answer Qus.) will be asked both from
                  detailed & non-detailed works with internal choice.

#### APPROVED BY THE BOARD OF STUDIES ON 03. 09. 2020

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|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual consent received |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |

| | |
|---|---|
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) |
| Ku. Ankita Tiwari | Meritorious Ex Student |

*Virtual consent received*

## Recommended Reading

1. K.R. Srinivasa Iyengar : Indian Writing in English
2. Gokak. V.K. : English in India, Its Present and Future
3. Sarang. Vilas : Indian English Poetry since 1950: An Anthology
4. Peeradena Saleem : Contemporary Indian Poetry in English (ed.) An Assessment and Selection
5. M.K. Naik (ed.) : Aspects of Indian Writing in English (Macmillan)
6. Parthasarthy, R. (ed.) : Ten Twentieth Century Indian Poets (Poems by Keki N. Daruwalla, Kamala Das, Nissim Ezekiel, Jayant Mahapatra. A.K. Ramanujan)

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
### SEMESTER-III

Maximum Marks-80
Minimum marks-16

Paper - III
Name of the Paper- American Literature- I
Number of Units- IV

**UNIT-I** Edgar Allen Poe

Walt Whitman

: Dream land                                    (Non Detailed)
: The raven
: When Lilacs Last in the Dooryard Bloomed   (Detailed)
  There Was a Child went forth Robert Frost

**UNIT-II** Emily Dickinson

: Success is Counted Sweetest,        (Detailed)
   Hope is the Thing with Feathers,
I felt a Funeral in my Brain,
After Great pain a Formal Feeling

Wallace Stevens

: The Emperor of Ice-Cream      (Non Detailed)
Sunday Morning

**UNIT-III** Robert Frost

: Stopping By the Woods.....
   Birches, Departmental      (Detailed)
   Mending Wall

Sylvia Plath

: Daddy, Lady Lazarus, The Bee Meeting.
        (Non Detailed)

**UNIT-IV** Emerson

: Self-Reliance.                        (Detailed)

Thoreau

: Civil Disobedience.         (Non Detailed)

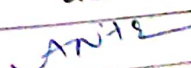**DIRECTIVES: -** 1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus.of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study ( Unit I,II & III). Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

APPROVED BY THE BOARD OF STUDIES ON 03.09.2020

| NAME | IN THE CAPACITY OF | SIGNATURE |
|------|--------------------|-----------|
| Dr. Anita Shankar | Chairman | ANita |

| | | |
|---|---|---|
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | *virtual consent received* |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

# Recommended Reading

1. Forester Norman : American Poetry and Prose V. 4
2. Cox. James M. (ed.) : Robert Frost : Twentieth Century Views.
3. Pearce. Roy Harvey : Whitman : Twentieth Century Views.
4. Barroff, Marie (ed.) : Wallace Stevens : 20th Century Views.

## M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-III

Maximum Marks-80
Minimum marks-16

Paper - IV
Name of the Paper- Linguistics-I
Number of Units- IV

UNIT-I  (a) What is language? Characteristics of Language.
(b) What is Lingistics? Linguistics as a Science.
(c) Synchronic, Diachronic and Historical Linguistics

UNIT-II  (a)Scope, Levels and Branches of Linguistics
(b)Langue and Parole, Competence and Performance.

UNIT-III  (a)Socio-lingistics : Theories of language variation- Dialect and Socio-dialect, Code, Registers.
(b)Psycholinguistics: Theories of Language Acquisition ( Empirical/ Behavioral approach and  Rationalistic Approach)
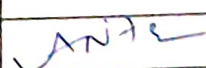
UNIT-IV  (a) Morphology: Morphemes, Allomorphs, Free and Bound Morphemes, Zero Morphemes)
(b) Introduction to Phrase Structure Grammar (PS Rules)(Syntax NP-VP)
(c) I.C. Analysis, Limitations of IC Analysis
(d) Models of I.C. Analysis.

DIRECTIVES:  1.Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive  questions.
4. Very short answer questions will be asked from all Units (6 Qus.of 2 marks =12)
5. Short answer questions will be asked from all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Qus of 12 marks=48)

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| NAME | IN THE CAPACITY OF | SIGNATURE |
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| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

| | | | |
|---|---|---|---|
| 1. | D. Crystal | : | Linguistics |
| 2. | S.K. Verma | : | Modern Linguistics: An Introduction N. Krishnaswamy |
| 3. | Saussure | : | Course in General Linguistics |
| 4. | C.F. Hockelt | : | A Course in Modern Linguistics |
| 5. | R. Querk (Ed.) | : | A Grammar of Contemporary English |
| 6. | Chomsky | : | Reflections of Language |

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-III

Paper -V
Name of the Paper- Modernist Literature- 1

Number of Units- IV

Maximum Marks-80

Minimum marks-16

| | | | | |
|---|---|---|---|---|
| UNIT-I | Hopkins | : | Pied Beauty<br>Felix Randal<br>The Wind-hover. | (Non Detailed) |
| | W.B. Yeats | : | The Second Coming.<br>Sailing to Byzantium<br>Byzantium | (Detailed) |
| UNIT-II | T.S. Eliot | : | The Waste Land | (Detailed) |
| UNIT-III | Ted Hughes | : | Hawk Roosting<br>The Howling of Wolves | (Non Detailed) |
| | W.H. Auden | : | The Shield of Achilles, Sept. 1, 1939<br>In Memory of W.B.Yeats | (Detailed) |
| UNIT -IV | Dylan Thomas | : | Fern Hill<br>Refusal to Mourn the Death | (Non Detailed) |
| | Philip Larkin | : | The Whitsun Wedding<br>Church Going | (Detailed) |

DIRECTIVES: 1. Candidates are expected to study the entire prescribed syllabus thoroughly.

2. Each unit is compulsory.

3. Question paper will consist of very short answer, short answer and descriptive questions.

4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus.of 2 marks =12)

5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)

6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.

7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

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| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual Consent received |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |

| | | |
|---|---|---|
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | Virtual consent received. |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

| | | | |
|---|---|---|---|
| 1. | Faber book of Modern Verse | : | The Progress of T.S. Eliot as Poet and Critic |
| 2. | J.P. Sen | : | Five Modern Poets |
| 3. | J.P. Sen | : | The Rubaiyat of Omar Khayyam Explained |
| 4. | Paramhansa Yogananda | : | (Motilal Banarasidar Pub. Pvt. Ltd.. Delhi) |

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-IV

Paper -I

Name of the Paper- Critical Theory-II

Number of Units- IV

Maximum Marks-80

Minimum marks-16

UNIT-I    Virginia Woolf        : Modern Fiction                    (Non Detailed)
          T.S. Eliot            : Tradition and Individual Talent   (Detailed)

UNIT-II   Bharata                       : Natyashastra (Rasa & Bhava Theory) (Detailed)
          Anand Vardhamanacharya   :    Dhvanyaloka                         (Non Detailed)

UNIT-III  Ferdinand De Saussure : Nature of the Linguistic Sign     (Detailed)
          Cleanth Brook         : Language of Paradox               (Non Detailed)

UNIT-IV   Edward W. Said        : Introduction to Orientalism           (Detailed)
          Elaine Showalter      : Feminist Criticism in Wilderness  (Non Detailed)

DIRECTIVES:  1.Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus.of 2 marks =12)
5. Short answer questions will be asked from detailed works of all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Qus of 12 marks=48)
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

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| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | Virtual consen received. |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

# Recommended Reading

1. Sean Lucy : T.S. Eliot and the Idea of Tradition
2. J.P. Sen : The Progress of T.S. Eliot as Poet and Critic
3. Raman Selden : The Theory of Criticism from Plato to the Present: A Reader
4. David Lodge : Modern Criticism and Theory
5. Gayle & Green : Making a difference Feminist Literary Criticism
6. Dr. N.P. Unni : Natyashastra Vol. 1-4
7. V. Raghavan & Nagendra : An Introduction to Indian Poetics
8. Dr. Kapil Kapoor : Literary Theory: Indian Conceptual Frame-Work
9. V.S. Senturaman : Indian Aesthetics: An Introduction
10. G.N. Devy : Indian Literary Criticism

| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | Virtual consent received |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

1. V.K. Gokak : English in India: It's Present and Future
2. K.R. Srinivas Iyengar : Indian Writing in English
3. S. Radhakrishnan : Recovery of Faith
4. M.K. Naik : Aspects of Indian Writing in English

## M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER- IV

Maximum Marks-80
Minimum marks-16

Paper -III
Name of the Paper- I American Literature-II
Number of Units- IV

| | | | |
|---|---|---|---|
| **UNIT – I** | Nathaniel Hawthorne | : The Scarlet Letter | (Non-Detailed) |
| | Mark Twain | : Adventures of Huckleberry Finn | (Detailed) |
| **UNIT-II** | Eugene O' Neil | : The Hairy Ape. | (Detailed) |
| | Ernest Hemmingway | : The Old Man and the Sea | (Non-Detailed) |
| **UNIT-II** | Tennese Williams | : The Glass Menagerie | (Non Detailed) |
| | Arthur Miller | : Death of a Salesman | (Detailed) |
| **UNIT -IV** | William Faulkner | : The Sound and the Fury | (Detailed) |
| | Edward Albee | : Who is Afraid of Virginia Woolf? | (Non Detailed) |

**DIRECTIVES:**
1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Qus.of 2 marks =12)
5. Short answer questions will be asked from detailed works of all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Qus of 12 marks=48)
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

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| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
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| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual consent received |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

# Recommended Reading

1. S. Bradley : The American Tradition in Literature

2. Rober Weeks (ed.) : Hemingway: Twentieth Century Views

3. Henry Nash Smith : Mark Twain: Twentieth Century Views

4. John Gassner (ed.) : O'Neil : Twentieth Century Views

5. A.N. Kaul (ed.) : Hawthorne: Twentieth Century Views

# M.A. ENGLISH LITERATURE
## Syllabus 2020-2021
## SEMESTER-IV

Paper -IV
Name of the Paper- Linguistics-II
Number of Units- IV

Maximum Marks-80
Minimum marks-16

**UNIT-I**     i) The Organs of Speech : places of Articulation
          ii) Phonetics: Articulatory, Acoustic & Auditory

**UNIT - II**   i) Classification of Consonants and Vowel sounds
          ii) Pure Vowels, Clusters, Syllables
          iii) Supra Segmental and Prosodic Phenomenon Stress, Pitch, Intonation, Juncture & Rhythm.

**UNIT-III**   Phoneme: Free Variation & Neutralization, Arrangement, Allophones, Received Pronunciation, Assimilation and Elison, Pattern Congruity, Transcription.

**UNIT-IV**   i) Essentials of Stylistics
          ii) Deviation, the irrational in Poetry, Ambiguity, Foregrounding, Figurative Language, Patterns  of Sound.

**DIRECTIVES:**     1.Candidates are expected to study the entire prescribed syllabus thoroughly.

2. Each unit is compulsory.

3. Question paper will consist of very short answer, short answer and descriptive questions.

4. Very short answer questions will be asked from all Units (6 Qus.of 2 marks =12)

5. Short answer questions will be asked from all units. (4 Qus of 5 marks=20).

6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Qus of 12 marks=48)

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| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | Virtual consent received. |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

## Recommended Reading

1. Daniel Jones — An Introduction to Phonetics
2. T. Balasabramanian — A Textbook of English Phonetics

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**M.A. ENGLISH LITERATURE**
Syllabus 2020-2021
SEMESTER-IV

</div>

Paper - V
Name of the Paper - Modernist Literature II
Number of Units- IV

Maximum Marks-80
Minimum marks-16

| | | | |
|---|---|---|---|
| UNIT-I | Rudyard Kipling | : Kim | (Detailed) |
| | James Joyce | : The Portrait of the Artist as a Young man | (Non Detailed) |
| UNIT-II | Joseph Conrad | : Lord Jim | (Non Detailed) |
| | George Orwell | : Animal farm | (Detailed) |
| UNIT-III | Samuel Beckett | : Waiting for Godot. | (Detailed) |
| | Yann Martel | : Life of Pi | (Non Detailed) |
| UNIT-IV | Bapsi Sidhwa | : Ice Candy Man | (Detailed) |
| | Paulo Coelho | : The Alchemist | (Non-Detailed) |

**DIRECTIVES:** 1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of all Units.(6 Qus of 2 marks=12)
5. Short answer questions will be asked from detailed works of all units. (4 Qus of 5 marks=20).
6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Qus of 12 marks=48)
7. Descriptive questions (Long Answer Qus.) will be asked both from detailed & non-detailed works with internal choice.

<div align="center">

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</div>

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr. Neerja Rani Pathak | Subject Expert (V C Nominee) | |
| Dr. Shukla Bannerjee | Subject Expert (Principal Nominee) | Virtual consen received |
| Dr. Tapas Mukherjee | Subject Expert (Principal Nominee) | |
| Shri. Kamlesh Baid | Advisor (Syllabus Committee) | |
| Ku. Ankita Tiwari | Meritorious Ex Student | |

Recommended Readings:

1. William Hutchings : Samuel Beckett's Waiting for Godot: A
   Reference Guide
2. Charles Carrington : Rudyard Kipling- His Life and Work
3. Edward Quinn : Critical Companion to George Orwell: A
   Literary Reference to His Life and Work
4. Rebecca Grudzina : Teaching Yann Martel's Life of Pi from
   Multiple Critical Perspectives

**Paper V**

Maximum marks: 80

**Name of the paper: Romanticism (Optional)**

Minimum marks: 16

**Number of Unit IV**

| Unit 1 | Lord Byron: | The Vision of Judgement, Isle (Criticism) | (Detailed) |
|---|---|---|---|
| | John Keats: | From the Letters (From English critical Text Edited by Enright & D' Chikrera ) | |
| Unit 2 | Lord Byron: | Don Juan, She Walks in Beauty | (Detailed) |
| | William Blake: | The Little Boy Lost, The Little Boy Found | |
| Unit 3 | Thomas de Quincey: | Confession of a English Opium Eater | (Detailed) |
| Unit 4 | Walter Scott: | The Bride of Lammermoor | (Detailed) |
| | M H Abraham: | Orientation of critical theories (From the Mirror and the Poetry) | |

**DIRECTIVES:**

1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Ques. of 2 marks =12)
5. For short answers, six passages will be given for annotation from the text prescribed for detailed study. Out of these, four are to be attempted and each annotation will carry five marks. (4 passages of 5 marks=20)
6. Candidates will answer 4 descriptive questions from unit I to IV, carrying 12 marks each=48.
7. Descriptive questions (Long Answer Ques.) will be asked both from detailed & non-detailed works with internal choice.

**APPROVED BY THE BOARD OF STUDIES ON ..................**

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anta |
| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual consent received. |
| Dr.GA Ghanshyam | Subject Expert (Principal Nominee) | |
| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
| Mr.Chandan Soni | Meritorious Ex Student | |

# M.A. ENGLISH LITERATURE
## Syllabus 2020-21
## SEMESTER-IV

Paper -IV
Name of the Paper- Romanticism II
Number of Units- IV (Optional)

Maximum Marks-80
Minimum marks-16

**Unit I**
Lord Byron: The Vision of Judgement, The Isles (Criticism)          (detailed)
John Keats: From the Letters (From English Critical Text Edited by Enright & D' Chikrera
                                                    (Non   Detailed)

**Unit II**
Lord Byron: Don Juan, She walks in Beauty                    (Detailed)
William Blake: The Little Boy Lost, The Little Boy Found          (Non-Detailed)

**Unit III**
Thomas de Quincy: Confession of a English Opium Eater
                                                    **(Detailed)**

**Unit IV**
Sir Walter Scott: The bride of Lammermoor **(Detailed)**
M H Abraham: orientation of critical Theories (From the Mirror and the Poetry)

**DIRECTIVES:**
1. Candidates are expected to study the entire prescribed syllabus thoroughly.
2. Each unit is compulsory.
3. Question paper will consist of very short answer, short answer and descriptive questions.
4. Very short answer questions will be asked from detailed works of Unit I - IV (6 Ques. of 2 marks =12)
5. Short answer questions will be asked from detailed works of all units. (4 Ques of 5 marks=20).
6. Candidates will answer four descriptive questions from all units, carrying 12 marks each. (4 Ques of 12 marks=48)
7. Descriptive questions (Long Answer Ques.) will be asked both from detailed & non-detailed works with internal choice

**APPROVED BY THE BOARD OF STUDIES ON ……………….**

| NAME | IN THE CAPACITY OF | SIGNATURE |
|---|---|---|
| Dr. Anita Shankar | Chairman | Anita |
| Dr.Mercy George | Subject Expert (V C Nominee) | Virtual consent received. |
| Dr.GA Ghanshyam | Subject Expert (Principal Nominee) | |
| Dr.Rashmi Dubey | Subject Expert (Principal Nominee) | |
| Dr.Aaftaab Aman | Advisor (Syllabus Committee) | |
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**Recommended Readings:**

1. Byron and Romanticism by Jerome McGann; James Soderholm

2. Blake: Complete Writings with Variant Readings by William Blake; Geoffrey Keynes

2020-21

# Department of English
## Division of marks in Credits

| Semester | Paper | Name of Paper | Credit | Marks | | |
|----------|-------|---------------|--------|-------|-----|-----|
| I | | | | | | |
| | I | Poetry I | 4 | 80 | 20 | 100 |
| | II | Drama I | 4 | 80 | 20 | 100 |
| | III | Prose I | 4 | 80 | 20 | 100 |
| | IV | Fiction I | 4 | 80 | 20 | 100 |
| | V | History of English literature I | 4 | 80 | 20 | 100 |
| II | | | | | | |
| | I | Poetry II | 4 | 80 | 20 | 100 |
| | II | Drama II | 4 | 80 | 20 | 100 |
| | III | Prose II | 4 | 80 | 20 | 100 |
| | IV | Fiction II | 4 | 80 | 20 | 100 |
| | V | History of English literature II | 4 | 80 | 20 | 100 |
| III | | | | | | |
| | I | Critical Theory I | 4 | 80 | 20 | 100 |
| | II | Indian writing in English I | 4 | 80 | 20 | 100 |
| | III | American Literature I | 4 | 80 | 20 | 100 |
| | IV | Linguistics I | 4 | 80 | 20 | 100 |
| | V | Modernist Literature I / Romanticism I | 4 | 80 | 20 | 100 |
| IV | | | | | | |
| | I | Critical Theory II | 4 | 80 | 20 | 100 |
| | II | Indian writing in English II | 4 | 80 | 20 | 100 |
| | III | American Literature II | 4 | 80 | 20 | 100 |
| | IV | Linguistics II | 4 | 80 | 20 | 100 |
| | V | Modernist Literature II Romanticism II | 4 | 80 | 20 | 100 |
| | | **Total Credits** | 80 | **Total Marks- 2000** | | |