



**Government K.L. Arts & Commerce College
Bagbahara, Dist. Mahasamund (C.G.)**

Affiliated to Pt. Ravishankar Shukla University Raipur (C.G.)

UGC Code:202052

AISHE Code:C-21751

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1.2.1 Number of programmes in which CBCS/Elective course system implemented

Certificate

It is to be certified that the Elective Course System for our College is decided in Academic Council BOS Meeting of the Affiliating University i.e Pt. Ravishankar Shukla University Raipur (C.G.)

Principal

Govt.K.L.Arts & Commerce College
Bagbahara, Dist.Mahasamund(C.G) (C.G)

उत्तर प्रदेश, रायपुर विश्वविद्यालय

रायपुर, छत्तीसगढ़

जिला- महासमुन्द (छ. ग.)

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.

PAPER - I (Paper Code-0898)

ANALYSIS

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 functions of two variables. Schwarz and Young's theorem. Implicit function theorem.

Fourier series. Fourier expansion of piecewise monotonic functions.

UNIT-II Riemann integral. Integrability of continuous and monotonic functions. 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. Fixedpoints, Cross ratio. Inverse points and critical mappings. Conformal mappings.

METRIC SPACES

UNIT-IV Definition and examples of metric spaces. Neighbourhoods, 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 metric space of rationals. Real numbers as a complete ordered field.

UNIT-V Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces. Continuous functions. Extension theorem. Uniform continuity, Isometry and homeomorphism. Equivalent metrics. Compactness, Sequential compactness. Totally bounded spaces. Finite intersection property. Continuous functions and compact sets, Connectedness, Components, Continuous functions and connected sets.

REFERENCES :

- 1 T.M. Apostol, Mathematical Analysis, Narosa 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 Course in Mathematical Analysis, Narosa Publishing House, New Delhi, 1997.
- 5 Shanti Narayan, A Course of Mathematical Analysis, S. Chand & Co. New Delhi.



PAPER - III - (OPTIONAL)

(II) DISCRETE MATHEMATICS (Paper Code-0901)

- 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** Relations and Functions - Binary Relations, Equivalence Relations and Partitions. Partial Order Relations and Lattices. Chains and Antichains. Pigeon Hole Principle. Graphs and Planar Graphs - Basic Terminology. Multigraphs. Weighted Graphs. Paths and Circuits. Shortest Paths. Eulerian Paths and Circuits. Travelling Salesman Problem. Planner Graphs.
TREES.
- UNIT-III** Finite State Machines - Equivalent Machines. Finite State Machines as Language Recognizers. Analysis of Algorithms - Time Complexity. Complexity of Problems. Discrete Numeric Functions and Generating Functions.
- UNIT-IV** Recurrence Relations and Recursive Algorithms - Linear Recurrence Relations with Constant Coefficients. Homogeneous Solutions. Particular Solution. Total Solution. Solution by the Method of Generating Functions. Brief review of Groups and Rings.
- UNIT-V** Boolean Algebras - Lattices and Algebraic Structures. Duality, Distributive and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Expressions. Propositional 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.

PAPER - III - (OPTIONAL)

(III) APPLICATION OF MATHEMATICS IN FINANCE AND INSURANCE
(Paper Code-0902)

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 Raphson 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.





SYLLABUS

2019-2020



PT. RAVISHANKAR SHUKLA UNIVERSITY
RAIPUR
CHHATTISGARH

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EXAMINATION SCHEME

M.Sc. examination will be conducted in four SEMESTERS. Each semester exam shall consist of FOUR THEORY PAPERS AND TWO LAB COURSES.

SEMESTER –I (20 CREDIT)

THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH – 1	GROUP THEORY AND CHEMISTRY OF METAL COMPLEXES	4	4 Hrs	20	80	100
CH – 2	CONCEPTS IN ORGANIC CHEMISTRY	4	4 Hrs	20	80	100
CH – 3	QUANTUM CHEMISTRY, THERMODYNAMICS AND CHEMICAL DYNAMICS - I	4	4 Hrs	20	80	100
CH – 4	THEORY AND APPLICATIONS OF SPECTROSCOPY-I	4	4 Hrs	20	80	100

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH – 5	Lab Course - I	2	8 Hrs	100
CH – 6	Lab Course - II	2	8 Hrs	100

SEMESTER –II (20 CREDIT)

THEORY (16 CREDIT)

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH – 7	TRANSITION METAL COMPLEXES	4	4 Hrs	20	80	100
CH – 8	REACTION MECHANISMS	4	4 Hrs	20	80	100
CH – 9	QUANTUM CHEMISTRY, THERMODYNAMICS AND CHEMICAL DYNAMICS - II	4	4 Hrs	20	80	100
CH – 10	THEORY AND APPLICATIONS OF SPECTROSCOPY-II	4	4 Hrs	20	80	100



PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH - 11	Lab Course - III	2	8 Hrs.	100
CH - 12	Lab Course - IV	2	8 Hrs.	100

SEMESTER -III (20 CREDIT)**THEORY (16 CREDIT)**

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH - 13	RESONANCE SPECTROSCOPY, PHOTOCHEMISTRY AND ORGANOCATALYSIS	4	4 Hrs	20	80	100
CH - 14	CHEMISTRY OF BIOMOLECULES	4	4 Hrs	20	80	100
CH - 15	CATALYSIS, SOLID STATE AND SURFACE CHEMISTRY	4	4 Hrs	20	80	100
CH - 16	ANALYTICAL TECHNIQUES AND DATA ANALYSIS	4	4 Hrs	20	80	100

PRACTICAL (4 CREDIT)

PAPER	COURSE	CREDIT	DURATION	MARKS
CH - 17	Lab Course - V	2	8 Hrs.	100
CH - 18	Lab Course - VI	2	8 Hrs.	100

SEMESTER -IV (20 CREDIT)**THEORY (16 CREDIT)**

PAPER	COURSE	CREDIT	DURATION	INTERNAL ASSESSMENT	THEORY MARKS	TOTAL MARKS
CH - 19	INSTRUMENTAL METHODS OF ANALYSIS	4	4 Hrs	20	80	100
CH - 20	NATURAL PRODUCTS AND MEDICINAL CHEMISTRY	4	4 Hrs	20	80	100
CH - 21	MATERIAL AND NUCLEAR CHEMISTRY	4	4 Hrs	20	80	100

CH - 22	ENVIRONMENTAL & APPLIED CHEMICAL ANALYSIS	4	4 Hrs	20	80	100
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OR
OPTIONAL PAPERS

CH-22 a	MEDICINAL CHEMISTRY					
22 b	CHEMISTRY OF SURFACTANTS					
22 c	CHEMISTRY AND APPLICATION OF PESTICIDES					
22 d	MOLECULAR SYMMETRY, COORDINATION AND ORGANOMETALLIC CHEMISTRY					
22 e	NANOCHEMISTRY					
22 f	CHEMISTRY OF NATURAL PRODUCTS					
22 g	POLYMERS					
22 h	FORENSIC CHEMISTRY					
PRACTICAL (4 CREDIT)						
PAPER	COURSE**		CREDIT	DURATION	MARKS	
CH-23	Lab course VII Or Seminar		2	8 Hrs.	100	
CH-24	Lab course VIII Or Project work			8 Hrs.	100	
** Combination should be- Lab course VII + Lab course VIII OR Seminar + Project work			2			

SCHEME FOR LABORATORY EXPERIMENT EXAMINATION

EXPERIMENT	MARKS
Object-1	30
Object -2	30
Viva-voce	20
Sessional Marks	20
TOTAL MARKS	100



M. Com. IVth Semester

Special attention to the Students. Students are required to select any one Specialization out of four suggested below.

Optional - Specialization

Optional Group - (A) Marketing

Optional Group - (B) Management

Optional Group - (C) Banking and Insurance

Optional Group - (D) Taxation and Accounting

Optional Group - (A) विपणन (Marketing)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper - A I प्रश्नपत्र - A I	विपणन के सिद्धान्त (Principle of Marketing)	80+20	401
Paper - A II प्रश्नपत्र - A II	विज्ञापन एवं विक्रय प्रबन्ध (Advertising & Sales Management)	80+20	402
Paper - A III प्रश्नपत्र - A III	विपणन अनुसन्धान (Marketing Research)	80+20	403
Paper - A IV प्रश्नपत्र - A IV	अन्तर्राष्ट्रीय विपणन (International Marketing)	80+20	404

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Optional Group – (D) करारोपण एवं लेखांकन (Taxation and Accounting)

प्रश्न पत्र	प्रश्नपत्र का नाम	पूर्णांक	पेपर कोड
Paper – D I प्रश्नपत्र – D I	भारत में प्रत्यक्ष कर (Direct Tax in India)	80+20	431
Paper – D II प्रश्नपत्र – D II	एकीकृत वस्तु एवं सेवा कर (Integrated Goods & Service Tax)	80+20	432
Paper – D III प्रश्नपत्र – D III	सेवा के क्षेत्र में लेखांकन (Accounting in Service Sector)	80+20	433
Paper – D IV प्रश्नपत्र – D IV	लेखांकन पद्धतियाँ (Accounting Methods)	80+20	434

महत्वपूर्ण नोट :

1. सत्र 2014-15 से एम. कॉम. प्रथम, द्वितीय एवं तृतीय सेमेस्टर में सभी प्रश्न-पत्र अनिवार्य होंगे। उक्त परीक्षा में वैकल्पिक प्रश्न-पत्र चयन की व्यवस्था नहीं होगी।
2. एम. कॉम. चतुर्थ सेमेस्टर में विशिष्टीकरण समूह (A), (B), (C) या (D) में से किसी भी एक वैकल्पिक समूह का चयन कर उस समूह के सभी चार प्रश्न-पत्र अनिवार्य रूप से लेने होंगे।
3. एम. कॉम. चतुर्थ सेमेस्टर में उपरोक्त विशिष्टीकरण समूह के अतिरिक्त 50 अंक की मौखिक परीक्षा तथा 50 अंक का परियोजना प्रतिवेदन (अधिकतम 50 पृष्ठों का) तैयार करना अनिवार्य होगा। यह प्रतिवेदन वाणिज्य या प्रबन्ध विषय से सम्बन्धित होगा।
4. सभी प्रश्न-पत्रों में लिखित परीक्षा 80 अंकों की तथा 20 अंकों की आन्तरिक मूल्यांकन परीक्षा होगी। आन्तरिक मूल्यांकन के अंक परीक्षार्थियों की उपस्थिति, सेमीनार, शोध एवं शैक्षणिक कार्य में भागिता, इकाईवार मूल्यांकन परीक्षा आदि के आधार पर प्रदान किये जायेंगे।
- 5- आन्तरिक परीक्षा एवं बाह्य परीक्षा में प्रश्नपत्रवार न्यूनतम उत्तीर्णांक 20% होगा। जो अध्यादेश क्रमांक 170 के प्रावधानों के अनुसार बंधनकारी होगा।

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