As recommended by Central Board of Studies and approved by the Governor of M.P.

BS-201: MATHEMATICS-II
(Calculus,Differential Equations & Vector Calculus)
कलन, अवकल समीकरण एवं सदिश कलन

Course Objective:The objective of this course is to familiarize the students with basic concepts of Mathematics.

Scheme of Examination:

Total Marks: 150
Theory: 125
Internal: 25
There should be three sections in the question paper. All questions will be compulsory.

Section A (20 Marks): Will contain 10 objective questions. Two from each unit, each having 2 marks.

Section B (35 Marks): Will contain 5 short answer type questions (each having internal choice) one from each unit, each having 7 marks

Section C (70 Marks): Will contain 5 long answer type questions (each having internal choice) one from each unit, each having 14 marks.

NOTE: QUESTION PAPER SHOULD BE SET IN BOTH THE LANGUAGES (i.e. HINDI & ENGLISH).

COURSE CONTENTS:

UNIT- I:
Concept of Partial differentiation, Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions Asymptotes and Curvature Tests for concavity and convexity Points of inflexion. Multiple points- Tracing of curves in Cartesian and polar co-ordidnates.

आंशिक अवकलन की अवधारणा, उत्तरोतर अवकलन, लैबनीज का प्रमेय, मैकलारिन एवं टेलर श्रेणी में विस्तार। अनंतस्पर्शी, वक्रता उत्तलता एवं अवतलता के परीक्षण , बहुबिन्दु। कार्तीय एवं ध्रुवीय निर्देशांको में वक्रों का अनुरेखण ।

UNIT II :
Integration of irrational algebraic functions and transcendental functions. Reduction formulae. Definite Integrals Quadrature, Rectification, Volumes and Surfaces of solids of revolution of curves.

अपरिमेय, बीजीय एवं अबीजीय फलनों का समाकलन। समानयन सूत्र। निश्चित समाकलन। क्षेत्रफलन,रेक्टीफिकेशन, वक्रों के परिभ्रमण से प्राप्त ठोसों का आयतन एवं सतह।

UNIT III:

Linear equations and equations reducible to the linear form. Exact differential equation. First order higher degree equations for x,y,p, Clariaut's form and singular solutions. Linear differential equations with constant coefficients.

रैखिकसमीकरण, रैखिकसमीकरणोंमें रूपांतरणीय समीकरण, यथावतअवकलसमीकरण।x,y,p,मेंप्रथमकोटि, उच्चघात के समीकरण,क्लारेटफार्म एवंविचित्र हल।अचरगुणांको के रैखिकसमीकरण।

UNIT IV:

Honogenous linear ordinary differential equations,linear differential equations of second order. Transformation of the equation by changing the dependent variable and the independent variable Method of variation of parameters,Ordinary simultaneous differential equations.

सामान्य समघातरैखिकअवकलसमीकरण, व्दिघातरैखिकअवकलसमीकरण, परतंत्र एवं स्वतंत्र चरोंकोबदलकरसमीकरणका रूपांतरण।प्राचलविचरण की विधि, साधारण युगपदअवकलंसमीकरण।

UNIT V:

Vector differentiation. Gradient, Divergence and Curl.Vector integration. Theorem of Gauss (without proof) and problems based on it. Theorem of Green (without proof) and problems based on it.

Stoke's theorem (without proof) and problems based on it.

सदिशअवकलन, ग्रेडियंट, डायव्हर्जेस एवंकर्ल।
सदिशसमाकलन, गॉस की प्रमेय (बिना उपपत्ति) एवं उस परआधारितप्रश्न।
ग्रीनकाप्रमेय (बिना उपपत्ति) एवं उस परआधारितप्रश्न।
स्टोककाप्रमेय (बिना उपपत्ति) एवं उस परआधारितप्रश्न।

Texts Books-

1. Gorakh Prasad – Differential Calculus, PothishalaPvt.Ltd. Allahabad
2. Gorakh Prasad – Integral Calculus, PothishalaPvt.Ltd. Allahabad
3. D.A.Murray : Introductory Course in Differential Equations,Orient Long man India 1967.
4. N.Saran&S.N.Nigam- Introduction to Vector Analysis. PothishalaPvt.Ltd. Allahabad

Reference Books –

1. Gabriel Klambauer – Mathematical Analysis Marcel Dekkar,Inc.New York.1975
2. Murray R.Spiegel,Theory& Problems of Advanced Calculus. Schaum's outline series. Schaum Publishing Co.NewYark.
3. P.K.Jain and S.K. Kaushik. An introduction of Real Analysis,S.Chand& Co. New Delhi 2000
4. Erwin Kreyszig. Advanced Engineering Mathematics,John Wiley & Sons 1999.
5. G.F.Simmons,Differential Equations. Tata Macgraw Hill, 1972.
6. E.A.Codington, An introduction to ordidnary differential equations Prentice Hall of India 1961.
7. H.T.H.Piaggio, Elementary Treatise on Differential equations and their applications, C.B.S.Publisher and Distributors, Delhi 1985.
8. W.E.Boyce and P.C.Diploma,elementary Differential equations & Boundary Value problems,John Wiley 1986.
9. Murray R.Spiegel,VectorAnalysis,Schaum Publishing Co.New York.
10. 10-Erwin Kreyszig, Advanced Engineering Mathematics,John Wiley & Sons 1999.
11. Shanti Narayan, A text book of Vector Calculus, S.Chand& Co. New Delhi.
12. म.प्र.हिन्दी ग्रंथ अकादमी की पुस्तकें ।

As recommended by Central Board of Studies and approved by the Governor of M.P.

BS-202: STATISTICS-II
(Statistical Methods & Probability Distribution)
सांख्यिकीय विधियाँ एवं प्रायिकता बंटन

Course Objective:The objective of this course is to familiarize the students with basic concepts of Statistics.

Scheme of Examination:

Total Marks: 150
Theory: 85
Internal: 15
Practical: 50

There should be three sections in the question paper. All questions will be compulsory.

Section A (15 Marks): Will contain 15 objective questions from all units each having 1 mark.
Section B (20 Marks): Will contain 5 short answer type questions (each having internal choice) one from each unit, each having 4 marks
Section C (50 Marks): Will contain 5 long answer type questions (each having internal choice) one from each unit, each having 10marks

NOTE: QUESTION PAPER SHOULD BE SET IN BOTH THE LANGUAGES (i.e. HINDI & ENGLISH).

Course Contents:

UNIT I:
Plane of regression, Properties of residual,Yule's notation,Multiple and Partial regression,Multiple and partial correlation coefficient(For three variables) and their properties.

समाश्रयण तल, अवशिष्ट के गुण, यूल के संकेत, बहुगुणी एवं आंशिक समाश्रयण, बहुगुणी एवं आंशिक सहसंबंध गुणांक (केवल तीन चरो के लिए) एवं उनके गुण।

UNIT II:
Theory of Attributes – Class, Class frequencies, order of classes, consistency of data conditions for consistency of data. Independence of attributes,criterion for independence of attributes. Yule's coefficient of association,coefficient of colligation.

गुणसंबंध सिद्धांत : वर्ग, वर्ग आवृत्तियां, वर्गो के क्रम, आंकड़ों की संगति,आंकड़ों की संगतता हेतु शर्ते। गुणों की स्वतंत्रता, गुणों की स्वतंत्रता के लिए मापदण्ड, यूलका साहचर्य गुणांक, संबंधन गुणांक।

UNIT III:

Theoretical Discrete Distributions- Binomial Distribution. Poisson Distribution (Limiting form of Binomial Distribution),Negative Binomial Distribution. Geometric Distribution, Hyper geometric Distribution and their properties.

सैद्धांतिक खंडित बंटन–व्दिपद बंटन, प्वॉयसन बंटन (व्दिपदबंटनकासीमांत रूप)
ऋणात्मक व्दिपद बंटन, गुणोत्तर बंटन, अति गुणोत्तर बंटन एवं सभी के गुण ।

UNIT IV:

Theoretical continuous Distribution- Rectangular or Uniform Distribution,Normal Distribution,Gamma Distribution,Beta Distribution ($I^{st}$and II^{nd} kind), Exponential Distribution,Cauchy Distribution and their properties.

सैद्धातिक सतत बंटन : आयताकार या एक समान बंटन, प्रसामान्य बंटन, गामा बंटन,बीटा बंटन (प्रथम एवं व्दितीय प्रकार), चर घातांकी बंटन, कॉशी बंटन एवं इन सभी के गुण।

UNIT V :

Bivariate normal Distribution – Marginal and Conditional Distribution,moment generating function, their properties and limitations (without proof). Cumulants and their properties. Chebyshev's inequality, convergence in probability. Weak law of large numbers, Central limit theorem-Lindeberg-Levy's and De-moiver-Laplace theorem.

व्दिचर प्रसामान्य बंटन : उपांत एवं सप्रतिबंध बंटन,आघूर्णजनक फलन, इसके गुण व सीमाएं(व्युत्पत्ति रहित)क्युमलेन्टस एवं इसके गुण। शेबिशेव असमिका, प्रायिकता में अभिसरण, वृहत संख्याओं का दुर्बल नियम, बृहत संख्याओं का बर्नोलीनियम। केन्द्रीय सीमा प्रमेय–लिंडेबर्गलेवी एवंडी–माइवर–लाप्लास प्रमेय।

Suggested Readings :

1. P.Mukhopadhaya – Mathematical Statistics new central book agency,Calcutta.
2. A.K.Goon,M.K.Gupta and Das Gupta,Fundamentals of Statistics Vol-1.
3. J.N.Kupur and H.C. Saxena,Mathematical Statistics.
4. S.C.Gupta and V.K.Kapur,Fundamentals of Mathematical Statistics.
5. B.L. Agarwal,Basic Statistics, New Age.
6. बी.एल. अग्रवाल–सांख्यिकी विधियां

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BS-203: COMPUTER SCIENCE-II
Programming & Problem Solving through C-Language

Course Objective: The objective of this course is to familiarize the students with basic concepts of Computer Science.

Scheme of Examination:

Total Marks: **150**
Theory: **85**
Internal: **15**
Practical: **50**

There should be three sections in the question paper. All questions will be compulsory.

Section A (15 Marks): Will contain 15 objective questions from all units each having 1 mark.
Section B (20 Marks): Will contain 5 short answer type questions (each having internal choice) one from each unit, each having 4 marks
Section C (50 Marks): Will contain 5 long answer type questions (each having internal choice) one from each unit, each having 10marks

NOTE: QUESTION PAPER SHOULD BE SET IN BOTH THE LANGUAGES (i.e. HINDI & ENGLISH).

Course Contents:

UNIT- I:
Algorithm, Flowchart, Logic Development & Problem Solving. Structure of C program, C declarations, keywords, identifiers, constants, Variables, Data types, type conversion, Types of operators and expressions, Input and output functions in C.

UNIT- II:
Decision Statement – IF-ELSE statement, break, continue, goto, switch() case and nested IF statement. Loop Control Statements – For loop, While loop , Do-while loop and nested loops. Arrays – Definition, Initialization, characteristics, One, Two, Three and Multi-dimensional Arrays, Working with scanf, printf, Strings & Standard Functions.

UNIT –III:
Pointers – Introduction, Features, Declaration & Arithmetic operations on pointers. Pointers and Arrays, Array of pointers.
Pointers to pointers, pointers and strings, Void pointers Functions – Declaration, Prototype, Types of functions, Call by value and reference, Function with operators.

UNIT-IV:

Function with decision statements, function with Loop statements. Function with Arrays and Pointers. Types of Storage Classes.

Introduction to Files, Streams and File Types, Steps for file operations, File IO,

UNIT-V:

Files – Streams and file types, file operations Write and Other file functions. Command line arguments, Application of Command Line Arguments. Structure and Union – Declaration, Initialization, structure within structure, Array of structure, Enumerated data types, Union of structure.

Text Books:

1. E. Balaguruswamy, “Programming In C ”, TMH Publications
2. Kanetkar, “Let Us C”

References Books:

1. Ashok N. Kamthane, “Programming with ANSI and Turbo C”, Pearson Education
2. Ashok N. Kamthaneet. al., Computer Programming and IT (for RTU), Pearson Education, 2011 (ISBN 978-81-317-5970-7)
3. Mahapatra, “ Thinking In C ”, PHI Publications

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BS-204: FOUNDATION –I
ENGLISH LANGUAGE & INDIAN CULTURE I

Course Objective: The objective of this course is to familiarize the students with basic concepts of English.

Scheme of Examination:

Total Marks: 100

Theory: 85
Internal: 15

There should be three sections in the question paper. All questions will be compulsory.

Section A (15 Marks): Will contain 15 objective questions from all units each having 1 marks.

Section B (20 Marks): Will contain 5 short answer type questions (each having internal choice) one from each unit, each having 4 marks

Section C (50 Marks): Will contain 5 long answer type questions (each having internal choice) one from each unit, each having 10marks.

Course Contents:

UNIT-I:

1. Amalkanti : NirendranathChakrabarti
2. Sita : Toru Dutt
3. Tryst with Destiny : Jawaharlal Nehru
4. Delhi in 1857 : MirzaGhalib
5. Preface to the Mahabharata : C.Rajagopalachari
6. Where the Mind is Without Fear : Rabindranath Tagore
7. A Song of Kabir : Translated by Tagore
8. Satyagraha : M.K. Gandhi
9. Toasted English : R.K.Narayan
10. The Portrait of a Lady : Khushwant Singh
11. Discovering Babasaheb : Ashok Mahadevan

UNIT-II:

Comprehension.

UNIT-III:

Composition and Paragraph Writing(Based on expansion of an idea).

UNIT-IV:

Basic Language Skills: Vocabulary – Synonyms,Antonyms, Word Formation, Prefixes and suffixes, Words likely to be confused and Misused, Words similar in Meaning or Form,Distinction between Similar Expressions, Speech Skills.

UNIT-V:

Basic Language Skills :Grammar and usage – The Tense Forms, Propositions, Determiners and Countable/Uncountable Nouns, Verb,Articles, Adverbs.

Prescribed Books :

English Language and Indian Culture,published by M.P.HindiGranth Academy.

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BC-205: FOUNDATION –II

DEVELOPMENT OF ENTREPRENEURSHIP

Course Objective: The objective of this course is to familiarize the students with basic conceptsEntrepreneurship.

Scheme of Examination:

Total Marks: 50
Theory: 42
Internal: 08

There should be three sections in the question paper. All questions will be compulsory.

Section A (07 Marks): Will contain 7 objective questions from all units each having 1 mark

Section B (10 Marks): Will contain 5 short answer type questions (each having internal choice) one from each unit, each having 2 marks.

Section C (25 Marks): Will contain 5 long answer type questions (each having internal choice) one from each unit, each having 5marks.

NOTE: QUESTION PAPER SHOULD BE SET IN BOTH THE LANGUAGES (i.e. HINDI & ENGLISH).

Course Contents:

UNIT I:
Entrepreneurship- Meaning,Concept,Characteristics of entrepreneur.

UNIT II:
Types of entrepreneurship,importance and views of various thinkers(Scholars).

- Formation of goals,How to achieve goals
- Problems in achieving targets and solution
- Self motivation, elements of self motivation and development.
- Views of various scholars,evaluation,solutions.
- Leadership capacity: Its development and results.

UNIT III:
Projects and various organizations(Govt.,Non-Govt.), Govt.Projects,Non-Govt.projects. Contribution of Books,their limitations,scope.

UNIT IV:

Functions, Qualities, Management of a good entrepreneur.
Qualities of the entrepreneur. (Modern and traditional)
Management skills of the entrepreneur.Motive factors of the entrepreneur.

UNIT V:

Problems and scope of the entrepreneur

- Problem of Capital
- Problem of Power
- Problem of registration
- Administrative Problems
- Problems of Ownership.