SYLLABUS
B.Sc. (Computer Science, Statistics, Mathematics) Part – I
Outlines of Tests Syllabi and Courses of Reading.
Note:-Every theory paper will be of three hours duration.
For Examination of Session 2017-18, 2018-19 & 2019-20.
1st Semester

Code	Core/ Elective	Title of paper/ subject	Hrs./ Week	Max Marks Conti. Asmt.	Univ. Exam.	Total	Total Credits
CSM 111	Core	Algebra	4	30	45	75	4
CSM 112	Core	Trigonometry and Differential Calculus	4	30	45	75	4
CSM 113	Core	Computer Oriented Statistical Methods-I	3	20	30	50	3
CSM 114	Core	Probability Theory-I	3	20	30	50	3
CSM 115	Core	Statistical Practicals-I	4	-	50	50	2
CSM 116	Elective	Introduction to Information Technology	3	20	30	50	3
CSM 117	Elective	Computer Programming Using C	3	20	30	50	3
CSM 118	Elective	Computer Practicals-I	4	-	50	50	2
		Total		140	310	450	24

Note: 1. **The minimum pass marks in each paper is 35% in Continuous Assessment and University Examination separately subject to a minimum of 40% in aggregate.**

2. **In addition to above mentioned subjects, there will be a course of Qualifying Punjabi Compulsory/Elementary Punjabi as a qualifying subject.**

BREAK-UP OF MARKS FOR CONTINUOUS ASSESSMENT

OF THEORY PAPERS

1.	Two tests will be held and their average will be considered for assessment.	50% Marks
2.	Seminars/Assignments/Quizes/ Class participation	25% Marks
3.	Attendance Marks will be given according to below criteria: 75% attendance & above	25% Marks
	but less than 80%	60% Marks of allotted marks to attendance
	80% attendance & above but less than 85%	80% Marks of allotted marks to attendance
	85% attendance& above	100% Marks of allotted marks to attendance

CSM-111   ALGEBRA

No. of Lectures : 55   **Max. Marks :**

Uni. Examination − 45 ⎫
Int. Assessment   − 30 ⎬ 75

to be delivered

Time Allowed   : 3 Hours   **Min. Pass**
Marks

Uni. Examination -35% ⎫
Int. Assessment   -35% ⎬ 40% Aggregate

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks.

Use of scientific non-programmable calculator is allowed

SECTION-A

Relations between the roots and coefficients of general polynomial equation in one variable .Transformation of equations. Descarte's rule of signs. Solution of cubic equations (Cardon method). Biquadratic equations.

Mappings, Equivalence relations and partitions .Congruence modulo n.

Symmetric, Skew symmetric, Hermitian and Skew Hermitian matrices . Elementary operations on matrices. lnverse of a matrix .

SECTION-B

Linear independence of row and column vectors. Row rank ,column rank and rank of a matrix . Equivalence of column and row ranks. Eigen values, eigen vectors and the characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of a matrix. Applications of matrices to a system of linear (both homogeneous and non-homogeneous) equations. Theorems on consistency of a system of linear equations .

TEXT BOOKS

1.   P.B. Bhattacharya, S.K. Jain and S.R. Nagpaul, First Course in Linear Algebra,Wiley Eastern,New Delhi ,1983.
2.   S.K. Jain, A. Gunawardena and P.B. Bhatacharya, Basic Linear Algebra with MATLAB, Key College Publishing (Sprinder-Verlag), 2001.

RECOMMENDED READINGS

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

CSM-112 : TRIGONOMETRY AND DIFFERENTIAL CALCULUS

No. of Lectures : 55 to be delivered

Max. Marks : $\left. \begin{array}{l} \text{Uni. Examination} \quad - \ 45 \\ \text{Int. Assessment} \quad - \ 30 \end{array} \right\}$ 75

Time Allowed : 3 Hours

Min. Pass Marks : $\left. \begin{array}{l} \text{Uni. Examination} \quad -35\% \\ \text{Int. Assessment} \quad -35\% \end{array} \right\}$ 40% Aggregate

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks.

Use of scientific non-programmable calculator is allowed

SECTION-A

Trigonometry: De Moivre's theorem and its applications . Direct and inverse circular and hyperbolic functions. Logarithm of a complex quantiy. Expansion of trigonometrical functions. Gregory's series. Summation of series.

SECTION-B

Differential Calculus: $\varepsilon-\delta$ definition of the limit of a function . Basic properties of limits . Continuous functions and classification of discontinuities .Differentiability . Successive differentiation . Leibnitz theorem . Asymptotes . Curvature. Tests for concavity and convexity. Points of inflexion . Multiple points. Tracing of curves (Cartesian and parametric coordinates only).

TEXT BOOKS

1. S. L . Loney plane Trigonometry Part II, Macmillan and Company, London.
2. R.S. Verma and K.S. Shukla,Text Book on Trigonometry, Pothishala Pvt. Ltd., Allahabad.
3. P .K . Jain and S. K. Kaushik, An introduction to Real Analysis, S. Chand & Co. New Delhi, 2000.
4. Gorakh Prased Differential Calculus, Pothishala Private Ltd. Allahabad.

RECOMMENDED READINGS

1. Gabriel Klambauer, Mathematical Analysis , Marcel Dekkar,Inc. New York, 1975.
2. Murray R . Spiegel, Theory and problems of Advanced Calculus, Schaum's outline series, Schaum Publishing Co. New York

CSM-113 : COMPUTER ORIENTED STATISTICAL METHODS - I

No. of Lectures : 40 **to be delivered**	**Max. Marks :**	Uni. Examination − 30 Int. Assessment − 20	} 50
Time Allowed : 3 Hours	**Min. Pass Marks :**	Uni. Examination -35% Int. Assessment -35%	} 40% Aggregate

INSTRUCTIONS FOR THE PAPER SETTER
The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES
Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION- A
Collection of Data : Primary Data – Designing a Questionnaire and a Schedule. Secondary Data - its Major Sources including some Government Publications. Concept of a Statistical Population and Samples from a Population ;Quantitative and Qualitative Data , Discrete and Continuous Data ,Nominal, Ordinal , Ratio & Interval Scales .

Presentation of Data: Diagrammatical Representation of Data , Frequency Distribution, Graphical Representation , Histogram , Frequency Polygon , Frequency Curves and Ogives .

SECTION-B
Analysis of Quantitative Data : Univariate Data Concepts of Central Tendency , Dispersion , Skewness and Kurtosis and their Measures including those based on Quartiles and Moments. Sheppard's Correction for Moments (without derivation).

TEXT BOOKS

1. Goon, A.M., Gupta M.K., Dasgupta, B.   Fundamental of Statistics. Vol. 1. 2002, world Press. Calcutta.

RECOMMENDED READINGS

1. Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997): Statistics : A Beginner's Text, Vol, I, New Age International (P) Ltd.
2. Croxton F.E, Cowden D. J and Kelin S (1973) : Applied General statistics, Prentice Hall of India .
3. Spiegel, M.R. (1967): Theory & Problems of Statistics, Schaum's Publishing Series.
4. W.W. Daniel : Bio Statistics : A foundation for Analysis in the Health Sciences 7th Ed. (1999)
5. Wiley Series in Probability and Statistics. Applied Probability and statistics section.

CSM-114 : PROBABILITY THEORY – I

No. of Lectures : 40 to be delivered	**Max. Marks :**	Uni. Examination -30 Int. Assessment -20 } 50	
Time Allowed : 3 Hours	**Min. Pass Marks** :	Uni. Examination -35% Int. Assessment -35% } 40% Aggregate	

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION- A

Important Concepts in Probability :Random Experiment, Trial, Sample Point and Sample Space, Definition of an Event, Mutually Exclusive, Exhaustive, Independent and Equally Likely Events. Definition of the Probability-Classical and Relative Frequency approach to Probability, their Demerits and Axiomatic Approach to Probability. Properties of Probability Based on Axiomatic Approach, Conditional Probability, Bayes Theorem and Its Applications.

SECTION- B

Random Variable **:** Definition of Discrete Random Variables, Probability Mass Function ,Continuous Random Variable, Probability Density Function Illustrations of Random Variables and Its Properties, Expectation of a Random Variable and Its Properties-Moments, Measures of Location and Dispersion, Moment Generating Function and Probability Generating Function. Two Dimensional Random Variables –Joint, Marginal and Conditional Distributions (Concepts & Simple Applications) **.**

TEXT BOOKS

1. P.L. Meyer (1970) : Introductory Probability and Statistical Applications Addison-Wesley.
2. Goon, A.M., Gupta, M.K., Dasgupta, B.(1999) : Fundamental of Statistics, Vol. I, World Press ,Calcutta .
3. Mood A.M., Graybill F.A and Boes D.C. (1974) : Introduction to the Theory of Statistics, McGrawh Hill .

REFERENCE READINGS

4 Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997) : Statistics : A Beginner's Text, Vol. II, New Age International (P) Ltd.
5 David S (1996) : Elementary Probability, Oxford Press. John E. Freund's Mathematical Statistics 6th Ed. Pub. Pearson Education

CSM-115: STATISTICAL PRACTICALS - I

Total Practical Sessions: 25	**Max. Marks : 50**
(each of two hours)	
Time Allowed : 3 Hours	**Min. Pass : 40% Marks**

INSTRUCTION FOR THE PAPER SETTER AND THE CANDIDATES

The setting and evaluation will be done by a board of examiners consisting of Head, External examiner and the teacher(s) involved with the teaching of this paper.

The practical paper will consist of four exercises and the candidates will be required to attempt any three exercises.

The break-up of marks for the University Examination will be as under:

Lab. Record :   10
Viva-voce   :   10
Exercises   :   30

Lab Course:

The exercises will be based on the syllabus of the papers CSM-113(Computer Oriented Statistical Methods-I) and CSM-114(Probability Theory-I).

CSM - 116 : INTRODUCTION TO INFORMATION TECHNOLOGY

No. of Lectures : 40	**Max. Marks :**	Uni. Examination – 30 }	50
to be delivered		Int. Assessment – 20 }	
Time Allowed : 3 Hours	**Min. Pass :**	Uni. Examination -35% }	40% Aggregate
	Marks	Int. Assessment -35% }	

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION-A

Information Technology : Introduction, hardware and software, the information processing cycle. Information systems, software and data, IT Applications; Types of computers, Anatomy of a computer, Binary numbers, Binary arithmetic, digital revolution, computer as a digital device, Moore's Law, Bits and bytes, CPU, Memory : RAM and ROM, Registers, System buses, i/o Buses, communication with peripherals. Input and Output devices : Keyboards-virtual and ergonomic, OCR, handwriting recognition, bar code and speech recognition, scanners resolution, printers-Laser, dot matrix and inkjet. Secondary Storage : Storage devices and media, sequential and random storage, tracks and sectors, speed, storage capacity, Removable media. Storage Media : floppy and hard disks. RAID, Optical discs, Increasing storage capacity, backup and smart cards.

SECTION B

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, System Software Application Software. Number System: Non-positional and positional number systems, base-conversion, fractional numbers, various operations on numbers. Computer code: BCD, EBCDIC, ASCII.

WWW and Internet: Introduction, home page, connecting to web, browsing, information search, multimedia. Computer Network and communication: Network types, network topologies, network communication devices, physical communication media. Introduction of E-Commerce: Meaning, its advantages and Limitations, Type of E- Commerce Applications.

TEXT BOOK :

1. Curtin D.P., Foley K., Sen K., Morin C "Information Technology" : The breaking wave, TMH.
2. V. Rajaraman "Fundamentals of computer", PHI, N. Delhi,1996.
3. Chetan Srivastva," Fundamentals of information Technology, Kalayani Publishers, 2003.
4. Anshuman Sharma: "Fundamental of Information Technology", Lakhanpal Publishers

REFERENCE READINGS:

1. Williams B. K., Sawyer S.C., Hutchinson S. E., Using Information Technology, 3rd Edition, TMH.

CSM - 117: COMPUTER PROGRAMMING USING "C"

No. of Lectures : 40
to be delivered

Max. Marks : $\left.\begin{array}{l}\text{Uni. Examination} \quad - 30 \\ \text{Int. Assessment} \quad - 20\end{array}\right\}$ 50

Time Allowed : 3 Hours

Min. Pass : $\left.\begin{array}{l}\text{Uni. Examination} \quad \text{-35\%} \\ \text{Int. Assessment} \quad \text{-35\%}\end{array}\right\}$ 40% Aggregate
Marks

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION-A

Problem Solving with Computer : Algorithms, Pseudocodes and Flowcharts. Data types, constants, variables, arithmetic and logical expressions, data input and output, assignment statements, conditional statements, iteration.

Arrays, string processing, User-defined data types.

SECTION-B

Functions recursion, Parameter Passing by reference & by value. Structures, Multiple structures, Arrays of structures, Unions, Files: Reading , Writing text and binary files, Pointers, character pointers, pointers to arrays, Array of pointers, pointers to structures.

Debugging, testing and documentation ; structured programming concepts, top down & Bottom-Up design approaches.

(The programming language C is to be taught along with the course in detail)

TEXT BOOKS

1.   E. Balagurusamy, "Programming in C", Tata McGraw Hill.
2.   Kanetkar, "Let Us C", BPB Publications.

REFERENCE READINGS

1.   Richie and Kerningham, " C Programming".
2.   Rajaraman, V: Fundamentals of Computers (PHI, 1992)
3.   D. Dromey: How to solve it by Computer (Prentice-Hall 1985)

CSM-118 : COMPUTER PRACTICALS -I

Total Practical Sessions: 25   **Max. Marks : Uni. Examination: 50**
(each of two hours)
Time Allowed   : 3 Hours   **Min. Pass : 40%**
                                                 Marks

INSTRUCTION FOR THE PAPER SETTER AND THE CANDIDATES

The setting and evaluation will be done by a board of examiners consisting of Head, External examiner and the teacher(s) involved with the teaching of this paper.

The practical paper will consist of four exercises and the candidates will be required to attempt any three exercises.

The break-up of marks for the University Examination will be as under:

Lab. Record	:	10
Viva-voce	:	10
Development of programmes	:	30
& their execution		

Lab Course:

The exercises will be based on the syllabus of the papers CSM-113(Computer Oriented Statistical Methods-I) and CSM-117(Computer Programming using "C").

Code	Core/ Elective	Title of paper/ subject	Hrs./ Week	Max Marks		Total	Total Credits
				Cont. Asmt.	Univ. Exam.		
CSM 121	Core	Integral Calculus & Differential Equations	4	30	45	75	4
CSM 122	Core	Geometry	4	30	45	75	4
CSM 123	Core	Computer oriented Statistical Methods-II	3	20	30	50	3
CSM 124	Core	Probability Theory-II	3	20	30	50	3
CSM 125	Core	Statistical Practicals-II	4	-	50	50	2
CSM 126	Elective	Object Oriented Programming Using C++	3	20	30	50	3
CSM 127	Elective	Management Information System	3	20	30	50	3
CSM 128	Elective	Computer Practicals-II	4	-	50	50	2
		Total		140	310	450	24

Note:

1.In addition to above mentioned subjects qualifying course of " Drug Abuse Problem, Management and Prevention " in this semester according to Letter No. 1383/SM-6 dated 12/10/2016 received from A.R.(Meetings)

 2.The minimum pass marks in each paper is 35% in Continuous Assessment and University Examination separately subject to a minimum of 40% in aggregate.

 3 In addition to above mentioned subjects, there will be a course of Qualifying Punjabi Compulsory/Elementary Punjabi as a qualifying subject.

BREAK-UP OF MARKS FOR CONTINUOUS ASSESSMENT OF

THEORY PAPERS

1.	Two tests will be held and their average will be considered for assessment.	50% Marks
2.	Seminars/Assignments/Quizes/ Class participation	25% Marks
3.	Attendance	25% Marks

Marks will be given according to
below criteria:

75% attendance & above but less than 80%	60% Marks of allotted marks to attendance
80% attendance & above but less than 85%	80% Marks of allotted marks to attendance
85% attendance& above	100% Marks of allotted marks to attendance

CSM 121: INTEGRAL CALCULUS AND DIFFERENTIAL EQUATIONS

No. of Lectures : 55
to be delivered

Max. Marks : Uni. Examination -45, Int. Assessment -30 } 75

Time Allowed : 3 Hours

Min. Pass Marks : Uni. Examination -35%, Int. Assessment -35% } 40% Aggregate

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks.

Use of scientific non-programmable calculator is allowed

SECTION-A

Integration of irrational algebraic and transcendental functions . Reduction formulae. Definite integrals . Quadrature and rectification . Volumes and surfaces of solids of revolution .
Degree and order of a differential equation . Equation of first order and first degree. Equations in which the variables are separable . Homogeneous equations . Linear equations and equations reducible to the linear from . Exact differential equations .

SECTION-B

First order higher degree equations solvable for x, y, p. Clairaut's form and singular solutions . Geometrical meaning of a differential equation .Orthogonal trajectories .Linear differential equation with constant coefficients .Homogeneous linear ordinary differential equations.
Linear differential equations of second order .Transformation of the equation by changing the dependent variable / the independent variable. Method of variation of parameters .

TEXT BOOKS

1. Gorakh Prasad, Integral Calculus, Pothishala Private Ltd., Allahabad.
2. D.A. Murray, Introductory Course in Differential Equations, Orient Longman (India),1967.

RECOMMENDED READINGS

1. H.T.H. Piaggio, Elementary Treatise on Differential Equations and their Applications. C.B.S. Publisher & Distributors, Delhi , 1985.
2. Erwin Kreyszing, Advanced Engineering Mathematics, John Wiley and Sons, 1999.

CSM 122- GEOMETRY

No. of Lectures : 55
to be delivered

Max. Marks : Uni. Examination – 45 } 75
Int. Assessment – 30

Time Allowed : 3 Hours

Min. Pass : Uni. Examination -35% } 40% Aggregate
Marks   Int. Assessment -35%

INSTRUCTIONS FOR THE PAPER SETTER
The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks.

INSTRUCTIONS FOR THE CANDIDATES
Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 6 marks each where as section C will carry 21 marks.
Use of scientific non-programmable calculator is allowed

SECTION-A
Transformation of axes , shifting of origin, rotation of axes, reduction of the second degree equation into standard forms by transformation of co-ordinates. The invariants t , Δ and θ . Identification of curves represented by second degree equation.
Pole and polar, pair of tangents from a point, chord of contact ,equation of the chord in terms of midpoint and diameter of conic .
Conjugate diameters, Conjugate hyperbola .Asymptotes of a hyperbola, rectangular hyperbola . Special properties of parabola, ellipse and hyperbola.
Polar equations of conics and equations of chords, tangents and normals only .

SECTION-B
Sphere . Cone . Cylinder . Central conicoids. Paraboloids. Plane sections of concoids. Generating lines. Confocal conicoids . Reduction of second degree equation to standard forms.

TEXT BOOKS
1. S.L. Loney, The Elements of Coordinate Geometry, Macmillan and Company, London.
2. Gorakh Prasad and H.C. Gupta, Text Book on Coordinate Geometry , Pothishala Pvt. Ltd., Allahabad.
3. P.K. Jain and Khalil Ahmad, A Text Book of Analytical Geometry of two Dimensions, Wiley Eastern Ltd.,1994.
4. N. Saran and R.S. Gupta, Analytical Geometry of Three Dimensions, Pothishala Pvt. Ltd., Allahabad.

RECOMMENDED READINGS
1. R.J.T. Bell, Elementary Treatise on Coordinate Geometry of Three Dimensions, Macmillan India Ltd., 1994.

CSM-123 : COMPUTER ORIENTED STATISTICAL METHODS -II

No. of Lectures : 40 to be delivered	Max. Marks :	$\begin{array}{l}\text{Uni. Examination} \quad - \quad 30 \\ \text{Int. Assessment} \quad - \quad 20\end{array}\Big\}\ 50$
Time Allowed : 3 Hours	Min. Pass Marks :	$\begin{array}{l}\text{Uni. Examination} \quad -35\% \\ \text{Int. Assessment} \quad -35\%\end{array}\Big\}\ 40\%\ \text{Aggregate}$

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION - A

Bivariate Data :Scatter Diagram, Product Moment Correlation Coefficient and Its Properties, Coefficient of Determination. Spearman's Rank Correlation Coefficient . Concept of Errors in Regression, Principle of Least Square, Fitting of Linear Regression and Related Results.

SECTION-B

Multivariate Data: Concepts of Multiple Regression, Multiple and Partial Correlation Coefficients (Only Results No Derivations) and their Applications.

Analysis of Categorical Data: Contingency of Categorical Data ,Independence & Association of Attributes, Various Measures of Association for Two Way Classified Data.

TEXT BOOKS

1. Goon, A.M., Gupta M.K., Dasgupta, B.   Fundamental of Statistics. Vol. 1. 2002, world Press. Calcutta.

REFERENCE READINGS
2. Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997): Statistics : A Beginner's Text, Vol, I , New Age International (P) Ltd.
3. Croxton F.E, Cowden D. J and Kelin S (1973) : Applied General statistics, Prentice Hall of India .
4. Spiegel, M.R. (1967): Theory & Problems of Statistics, Schaum's Publishing Series.
5. W.W. Daniel : Bio Statistics : A foundation for Analysis in the Health Sciences 7th Ed. (1999).
6.   Wiley Series in Probability and Statistics. Applied Probability and Statistics Section.

CSM-124: PROBABILITY THEORY– II

No. of Lectures : 40 to be delivered	**Max. Marks :**	$\text{Uni. Examination} - 30$ $\text{Int. Assessment} - 20$ } 50
Time Allowed : 3 Hours	**Min. Pass Marks :**	$\text{Uni. Examination} -35\%$ $\text{Int. Assessment} -35\%$ } 40% Aggregate

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION- A

Standard univariate discrete distributions and properties : Discrete uniform, Binomial, Poisson, Hyper Geometric, Geometric and Negative Binomial distributions. Continuous univariate distributions: Uniform , Normal , Exponential, Gamma, Beta and Chi-square distributions.

SECTION-B

The bivariate normal distribution, the marginal and conditional probability distributions associated with the bivariate normal distribution (without derivation).

Chebyshev's inequality and its applications, statements and applications of weak law of large numbers and central limit theorems (De-moivre's-Laplace and Lindeberg-Levy versions).

TEXT BOOKS

1. P.L. Meyer (1970) : Introductory Probability and Statistical Applications Addison-Wesley.
2. Goon, A.M., Gupta, M.K., Dasgupta, B.(2002) : Fundamental of Statistics, Vol. I, World Press ,Calcutta .
3. Mood A.M., Graybill F.A and Boes D.C. (1974) : Introduction to the Theory of Statistics, McGrawh Hill .

REFERENCE READINGS

1. Bhat B.R, Srivenkatramana T and Rao Madhava K.S. (1997) : Statistics : A Beginner's Text, Vol. II, New Age International (P) Ltd.
2   David S (1996) : Elementary Probability, Oxford Press.
3   John E. Freund's Mathematical Statistics 6th Ed. Pub. Pearson Education

CSM-125:STATISTICAL PRACTICALS-II

Total Practical Sessions: 25   **Max. Marks :   50**
 (each of two hours)
Time Allowed   : 3 Hours   **Min. Pass :   40%**
                                                                  Marks

INSTRUCTION FOR THE PAPER SETTER AND THE CANDIDATES

The setting and evaluation will be done by a board of examiners consisting of Head, External examiner and the teacher(s) involved with the teaching of this paper.

The practical paper will consist of four exercises and the candidates will be required to attempt any three exercises.

The break-up of marks for the University Examination will be as under:

Lab. Record	:	10
Viva-voce	:	10
Exercises	:	30

Lab Course:

The exercises will be based on the syllabus of the papers CSM-123(Computer Oriented Statistical Methods-II) and CSM-124(Only Fitting of distributions).

CSM - 126: OBJECT ORIENTED PROGRAMMING USING C++

No. of Lectures : 40   **Max. Marks :**   Uni. Examination   − 30 ⎫   **50**

to be delivered   Int. Assessment   − 20 ⎭

Time Allowed : 3 Hours   **Min. Pass :**   Uni. Examination   -35% ⎫ **40% Aggregate**

    Marks   Int. Assessment   -35% ⎭

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION A

Evolution of OOP: Procedure Oriented Programming, OOP Paradigm, Advantages and disadvantages of OOP over its predecessor paradigms.

Characteristics of Object Oriented Programming: Abstraction, Encapsulation, Data hiding, Inheritance, Polymorphism, Code Extensibility and Reusability, User defined Data Types.

Introduction to C++: Identifier, Keywords, Constants, Operators: Arithmetic, relational, logical, conditional and assignment. Sizeof operator, Operator precedence and associativity.

Type conversion, Variable declaration, expressions, statements, manipulators
Input and output statements, stream I/O, Conditional and Iterative statements, breaking control statements.

Storage Classes: Automatic, Static, Extern, Register. Arrays, Arrays as Character Strings, Structures, Unions, Bit fields, Enumerations and User defined types.

Pointers: Pointer Operations, Pointer Arithmetic, Pointers and Arrays, Pointer to functions. Functions: Prototyping, Definition and Call, Scope Rules. Parameter Passing: by value, by address and by reference, Functions returning references, Const functions, recursion, function overloading, Default Arguments, Const arguments.

SECTION B

Inheritance: Multiple, Multilevel, Hierarchical .

Classes and Objects: Class Declaration and Class Definition, Defining member functions, making functions inline, Nesting of member functions, Members access control. this pointer. Union as space saving classes.

Objects: Object as function arguments, array of objects, functions returning objects, Const member functions. Static data members and Static member functions.

Friend functions and Friend classes.

Constructors: properties, types of constructors (Default, parameterized and copy), Dynamic constructors, multiple constructors in classes. Destructors: Properties, Virtual destructors. Destroying objects. Rules for constructors and destructors.

Array of objects. Dynamic memory allocation using new and delete operators, Nested and container classes. Scopes: Local, Global, Namespace and Class

Inheritance: Defining derived classes, inheriting private members, single inheritance, types of derivation, function redefining, constructors in derived class.

TEXT BOOKS

1. Herbert Schildt, "The Complete Reference C++", Tata McGraw-Hill, 2001.
2. Deitel and Deitel, "C++ How to Program", Pearson Education, 2001

REFERENCE READINGS

1. Robert Lafore, "Object Oriented Programming in C++", Galgotia Publications, 1994.
2. Bjarne Strautrup, "The C++ Programming Language", Addition- Wesley Publication Co., 2001.
3. E. Balagurusamy, " Object Oriented Programming with C++", Tata McGraw-Hill, 2001

CSM - 127: Management Information System

No. of Lectures : 40 to be delivered

Max. Marks : Uni. Examination — 30 } 50
Int. Assessment — 20

Time Allowed : 3 Hours

Min. Pass Marks : Uni. Examination -35% } 40% Aggregate
Int. Assessment -35%

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus and section C will consist of one compulsory question having seven parts of short-answer type covering the entire syllabus uniformly. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all, selecting two questions from each section A and B and the compulsory question of section C. All questions of sections A and B will carry 4 marks each where as section C will carry 14 marks.

Use of scientific non-programmable calculator is allowed

SECTION A

Framework of Management Information Systems: Importance's of MIS, Concepts of Management, information, system, Definition of MIS, information technology and MIS, nature and scope of MIS, MIS characteristics and functions.

Structure and classification of MIS: structure of MIS, MIS classification, Brief introduction of functional information system, financial information system, marketing information system, production/ Manufacturing information system, human resources information system.

Decision making and MIS**:** decision making, Simon's model of decision making, types of decisions, purpose of decision making, level of programmability, knowledge of outcomes, methods of choosing among alternatives, decision making and MIS.

Information and system concepts: types of information: strategic information, Tactical information, Operational information. Information quality, dimensions of information, System: Kinds of Systems, System related concepts, elements of systems, Human as an information processing system.

SECTION B

System development stages**:** System investigation, system analysis, system design, construction and testing, implementation, maintenance.

System development approaches (a brief introduction) : waterfall model, prototyping, iterative enhancement model, spiral model.

System analysis: introduction, requirement definition, , strategies for requirement definition, structured analysis tools: data flow diagram, data dictionary, decision trees , structured English, decision trees.

System Design: objectives, conceptual design, design methods, detailed system design.

Implementation and evaluation of MIS: implementation process, Hardware and software selection, Evaluation MIS, System maintenance.

Information system Planning: Information system Planning, planning terminology, the Nolan stage model, selecting a methodology, information resources management.

Information system (IS) as an Enabler: introduction, changing concepts of IS , IS as an enabler

TEXT BOOKS
1. D.P. Goyal, " Management information systems", Macmillan India Ltd.

REFERENCE READINGS
1. Bentley,"System Analysis and Design", TMH
2. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management" PHI.
3. A. Ziya Aktas, "Structured Analysis & Design of Information System", PHI.
4. V. Rajaraman, "Analysis & Design of Information Systems", PHI.
5. J. Kanter, "Management/Information Systems", PHI.

CSM-128: COMPUTER PRACTICALS - II

Total Practical Sessions: 25   **Max. Marks :   50**
 (each of two hours)
Time Allowed   : 3 Hours   **Min. Pass :   40%**
                                                  Marks

INSTRUCTION FOR THE PAPER SETTER AND THE CANDIDATES

The setting and evaluation will be done by a board of examiners consisting of Head, External examiner and the teacher(s) involved with the teaching of this paper.

The practical paper will consist of four exercises and the candidates will be required to attempt any three exercises.

The break-up of marks for the University Examination will be as under:

Lab. Record	:	10
Viva-voce	:	10
Development of programmes	:	30
& their execution		

Lab Course:

The exercises will be based on the syllabus of the papers CSM -126 (Object Oriented Programming using C++).