Maharshi Dayanand University Rohtak
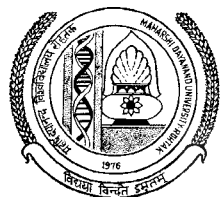
Ordinance, Syllabus and Courses of

Reading for

B. Sc. (Honours) Computer Science

Examination

Session - 2008-2009

MAHARSHI DAYANAND UNIVERSITY ROHTAK

Schemeof Examination and Syllabus of B. Sc. (Hons.)

Computer Science Part - I, II , III

B.Sc. (Hons.) Computer Science First Year

Paper No.		Title	Periods per week	Max. Marks	Continual Internal Assessment	Exam. Duration (hours)
BSC	101	Computer Funda-mentals and Pro-gramming	4	75	25	3
BSC	102	Mathematics-I	4	75	25	3
BSC	103	Mathematics-II	4	75	25	3
BSC	104	Analog Electronics	4	75	25	3
BSC	105	Behavioural and Communication Skills	4	75	25	3
BSC	106	Practicals Software Lab. based on paper BSC 101 and Software Tools	8 hours	75	25	4
BSC	107	Practicals Analog Electronics Lab. based on Paper BSC 104	8 hours	75	25	4
BSC	108	Data and File Structure	4	75	25	4
BSC	109	Structured Systems Analysis & Design	4	75	25	3
BSC	110	Mathematical Foun-dations of Computer Science	4	75	25	3
BSC	111	Digital Electronics	4	75	25	3
BSC	112	Electromagnetics and Basics	4	75	25	3
BSC	113	Practicals- Software Lab. based on BSC 108 Software Tools	8 hours	75	25	4
BSC	114	Practicals- Digital Electronics Lab. based on BSC 111	8 hours	75	25	4

B.Sc. (Hons.) Computer Science : Second Year

Paper No.	Title	Periods per week	Max. Marks	Continual Internal Assessment	Exam. Duration (hours)
BSC 201	Computer System Architecture	4	75	25	3
BSC 202	Algorithems & Advanced Data Strcutures	4	75	25	3
BSC 203	Microprocessors-I	4	75	25	3
BSC 204	Data base System	4	75	25	3
BSC 205	Practical Software Lab. based on BSC 202 & BSC 204 and Software Tools	8 hours	75	25	4
BSC 206	Practical Microprocessor Programming and Interfacing Lab. based on BSC 203	8 hours	75	25	4
BSC 207	Operating Systems Organisation and UNIX	4	75	25	3
BSC 208	Software Engineering	4	75	25	3
BSC 209	Object Oriented Design and Programming	4	75	25	3
BSC 210	Theory of Computation	4	75	25	3
BSC 211	Practicals- Software Lab. based on BSC 207 and Software Tools	8 hours	75	25	4
BSC 112	Practicals- Software Lab. based on BSC 209 Software Tools	8 hours	75	25	4

B.Sc. (Hons.) Computer Science : Third Year

Paper No.	Title	Periods per week	Max. Marks	Continual Internal Assessment	Exam. Duration (hours)
BSC 301	Data Communication and Networks	4	75	25	3
BSC 302	Computer Graphics	4	75	25	3
BSC 303	Principals of Visual and Windows Programming	4	75	25	3

Paper No.	Title	Periods per week	Max. Marks	Continual Internal Assessment	Exam. Duration (hours)
BSC 304	Micro Processor-II	4	75	25	3
BSC 305	Practical- Software Lab. based on BSC 302, 303 and Software Tools	8 hours	75	25	4
BSC 306	Practical Computer and Communication Lab. based on BSC 301 & 304	8 hours	75	25	4
BSC 307	**SummerTraining/Project**	-	75	25	3
BSC 308	Network & Internet Technologies and Applications	4	75	25	3
BSC 309	Scientific and Statistical Computing	4	75	25	3
BSC 310	Multimedia and Applications	4	75	25	3
BSC 311	Enterpreneurship	4	75	25	3
BSC 312	Practical- Software Lab. based on BSC 308 & 309 and Software Tools	8 hours	75	25	4
BSC 313	Practical - Software Lab. based on BSC 310 & 311 and Software Tools	8 hours	75	25	4

Note : Software Tools include : appropriate software packages.

Note : Examiner(s) is/are requested to set eight questions, covering the whole Syllabus in each paper, out of which the candidate will be required to attempt only five questions.

BSC (Hons.) Computer Science Part- I

BSC-101   Computer Fundamentals and Programming

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Computer Fundamentals :

Number System : decimal, Octal, binary and hexodecimal, Representation of intergers, fixed and floating points, character representation : ASCII, EBSDIC Functional units of computer, I/O devices, primary and secondary memories.

Programming Fundamentals

Algorithem developments. Techniques of problem solving. Flow charting, Stepwise refinement, Algorithems for searching, Sorting (exchange and insertion), merging of ordered lists.

Programing : Representation of integers, characters, reals,

Data types : constants and variables; Arithmetic expressions, Assignment statement. Logical expression, Sequencing, Alteration and iteration, Arrays String pocessing; Sub-programs, Recursion, Files and pointers . Structured programming concepts : Top down Design, Development of efficient programms : Programs Correctness : Debugging and testing of programs.

BSC-102   Mathematics-I

Max. Marks External : 75

(Theory) Internal Assessment : 25

Time allowed : 3 hrs.

Differentiation and partial differentiation of vector functions, Derivative of sum, dot product and cross product of two vectors, gradiant, divergance and curl System of circles, standard equations and properties of parabola. Ellips and Hyperbola.

General equation of second degree in two variables, tracing of conic sections. Sphere.

Successive differentiation, Leibntz theorem, Partial differentiation, Curvature, Asymptoreu, Singular points Concavity, Points of inflexion and tracing of cartesian curves. Integration of irrational functions. Reduction formulae, Rectification, Quadrature, Volumes and surfaces of revolution, Differential equation of first order, Groups, Rings, fields, Vector spaces.

Note : (i) Emphasis should be on Computer Applications.

Note :(ii) The Examiners are requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC -103 : Mathematics-II

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

The real number system as a complete ordered field, Neighbourhood, open and closed sets, limit points of sets, Bolzwno Weierstrass theorem.

Limits, continuity, sequential continuity, algebra of continuous functions, Continuity of cmplete functions, continuity on (a,b) implying boundedness, Intermediate value theorem, Inverse function theorem, Uniform continuity.

Sequence convergent sequence, Cauchy sequence, Monotonic sequence, Subsequence, limit superior and limit superior and limit inferior of sequence.

Infinite series convergence of series, positive term series, Comparison tests, Cauchy's nth root test, Dalembert's ratio test, Raabes test, auchy's integral test, Alternating series,

Absolute and conditional convergance. Taylor's series and Maclaurin's series.

(for Sin X, Cos X, log $(1+X)^m$) Application of Mean value theorem to monotone functions and inequalities, Maxima and Minima, Indeterminate forms.

Note : The emphasis should be on computer applications.

BSC -104 : Analog Electronics

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Diode characteristics : junction- diode, breakdown diode semiconductor photodiode, tunnel diode, characteristics; photovoltaic effect; Light Emitting Diode.

Diode circuits : clipping circuits ; components; sampling gates; rectifiers; capacitors filters.

Transistor circuits : bipolar transistor; field effect transistor; transistor biasing and thermal stablizing; transistor amplifier at low frequencies, transistor amplifier at high frequencies, multistages amplifier; feedback amplifier, stability and circulation; operational amplifier Linear analog circuits : analog integration and differentiation electonics analog computation; active filters; integrated circuit tuned amplifier; cascaded : video-amplifier. Nonlinear analog system : Comparators, sample-hold circuits; precision AC/DC converter; logarithmatic amplifier, wave form geneator; schmitt triger.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC -105 : Behavioural & Communication Skills

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Motivation :Characteristics of motivation, process of motivation, Maslow's needs hierarchy, Achievement motivation, Affiliation motivation. Power motivation, Expectancy Theory of motivation (Ch.7 Costley Book).

Foundation of Group Behaviour :

Definition and classifying groups, stages of group development External conditions imposed in the group, Group member resources, Group structure, Group Cohesiveness (Ch. 9 Robbins).

Leadership : Nature and definition, theories of leadership, Styles of Leadership behaviour, The managerial Grid, Fielder's contengency approach. Leadership effectiveness (Ch. 10 Costley, Ch. 11 Robbins).

Power Politics and Conflict : Bases and sources of power, Power Tactics, Power in groups, Politics : Power in action, implications for performance and satisfaction, (Ch. 12, Robbins).

Organizational Stress and its management : Stress, Stress and its consequences, potential sources of stress management strategies, implications for performance and satisfaction on (Ch. 18, Robbins).

Process of Communication : The importance of communication, Barriers of effective communication, Effective listening (Ch. 5, Costley).

Communication Affectiveness in Organizations : Changing management concepts in communication, Ptactices to improve communication (Ch. 6, Costley).

Communication and Group Decision Making : Direction of communication, formal vs informal network decision making, Group decision making, group vs the individual, group-think and group-shift, group decision making techniques. (Ch.10, Robbins).

References : Robbin Stephen B (1944) (Sixth edition), Organizational behaviour, New Delhi : Prentice Hall of India Pvt. Ltd.

Costley Dan L and Todd Ralph (1991) Human relations in fourth edition) New York : West Publishing Company.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC -108 : Data & File Structure

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Data Structures :

Linear and list structures : Arrays, stacks, queues and lists, Sequential and linked structures. Simple linked lists, circular linked lists, doubly linked lists, inverted lists, threaded lists.

Operations on all these structures and applications.

Arrays : Multi dimensional arrays, sequential allocation, address calculations, sparse arrays.

Tree Structures : Trees, binary trees, trees traversal algorithms, threaded trees, binary search trees, trees in search algorithms, B-tree E-tree and applications.

File Structure :

Physical storage devices and their characteristics, constituents of a file viz. fields, records, fixed and variable length records, primary and secondary keys, File operations, Basic file system operations.

File organizations : serial sequential, indexed sequential Direct inverted, multilist.

Hasing functions and collision handling methods.

BSC -109 : Structured System Analysis & Design

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Introduction to systems and contemporary System Analysis : Effective communication in system analysis - Tools of the system Analyst, problem definition, classification data collection and analysis.

Systems Planning and alternative, Feasibility and proposal User and management involvement, planning alternatives, design considerations, systems feasibility, selection of a System Plan, the system proposal.

System Cost Determination : Systems costs and system benefits, comparative cost analysis, data processing costs, DP cost centre concept.

A structured Approach to System Design : Structured Top-down design, logical design requirements, data administration and data dictionaries, auditable systems, Forms requirements and design CRT screen design, Program specification, development completion schedule. Structured walk throughs.

Project Management and Control, Gantt Charts, PERT & CPM. Systems Conversion and Implementation : Planning considerations, conversion methods, systems follow-up quality assurance of new systems.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC -110 : Mathematical Foundation of Computer Science

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Set : Cardinality, counting, operations.

Foundations : Boolean functions, permutation functions.

Induction : Principles of Mathematical induction Format's Theorem (Without proof).

Expoenentiation : (How to complete first exponentiation) Adventages of logarithmic algorithms over linear algorithms Big Oh" notation, Binomial coefficients, lexicographic order.

Number theory : GCD, Euclidean algoithms Fibonacci Numbers complixity, congruences and equivalence relations, public key Encryption schemes.

Graph Theory : Graphs, trees and LAN Minimum distance trees, Minimum weight & Minimum distance spanning trees, recursive procedures.

Recursion : Merge sort, Insertion sort, Bubble sort, Decimal to Binary.

Recurrence relations : LHRR, LHRRWCCS, DCRR.

BSC -111 : Digital Electronics

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Logic circuit hardware : basic logic gates - AND, OR, NOT, NOR, EX-OR, Logic, DTL, RTL,TTL, ECL, COMS, logic circuits, fanout, propogation delay, noise immunity of logic circuits.

Boolean Algebra : Boolean operators and truth table, Boolean expression and Boolean laws, De-Morgan's theorem, universal building blocks.

Logic circuit minimization : sum of products and product of sums form algebric simplification, K-map minimization techniques Q-M minimization procedure.

Combinational circuits : adder, subtractor, encoder, decoder, multiplexor, demultiplexor.

Sequential logic : RS, JK, Master slave J-K flipflop, D Type toggle, edge triggered flipflop counters- synchronous and ripple counters, shift registers-serial to parallel, parrallel to serial conversion.

Memory circuits : RAM, ROM,EEROM, static & dynamic RAM, EDO, RAM, Analog to digital, digital to analog convertor, PLA Fundamentals of electronics devices : overview of semiconductor physics, diode and transistor characteristics diode and transistor as a switch.

Saturated and nonsaturated logic, TTL, ECL, MOS, CMOS Logic circuits; OR, AND, NOT, EX OR Logic; positive and negative logic : De Morgan's theorem, universal building block; laws and theorems of boolean algebral TTL and gates; open collector TTL, wire-or; three state logic; simplifying logic circuits-sum of product and product of sum form, algebraic simplification, kainaugh and product of sum form, simplification; arithmatic circuits; flips-flops and multivibrator circuits; counter design techniques; shift registers; encoder; decoder, multiplexor, demultipleixor circuits.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC -112 : Electromagnetic

Electromagnetics and Magnetism

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Electric field, Potential due to charge distribution and due to a dipole,

Electric potential energy, Flux, Gauss's law, Electric field in a dielectric,

Energy stored in electric field; Magnetic field due to a current carrying conductor, Bio Savmt law Magnetic force on a current Loreniz force. Displacement vector, Boundary condition, Electromegnetic, Induction, Faradays Law of Induction.

Electromegnetism :

Modification of Ampere's Law, Equation of continuity and displacement current, Maxwell's equations, Wave equations and its plane wave solution, Nature of electromagenetic waves transversality and polarisation wave at a plane interface between dielectrics, Fresnel formulae Total internal reflection, Waves in conducting media Metallic Reflection (normal iincidence).

Skin depth, wave guides, Modes in rectangular wave guides, Energy flow and attenuation in wave guides, resonant cavities, Power loss in a cavity Q of a cavity, Optical fibre, Numerical aperture, Propogation of electromegnetic waves in misotropic media, Maxwell's equations in Microscopic media (plasma), Characteristics plasma frequency, Propagation of electromagnetic waves in ionosphere.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

B.Sc - (Hons.) Computer Science Part-II

BSC. - 201 Computer System Architecture

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Register transfer and Micro-operations, Register Transfer Language, Bus and memory, Transfers, Arithmetic Logic Micro operations, Shift Micro operations.

Basic Computer Organization and Design : Instructions and Instruction Codes, Computer Instructions, Instructions, Input-Output and Interrupts, Complete Computer, Description, Programming the basic Computer.

Microprogrammed Control : Control memory, Address Sequencing, Microprogram Example, Design of Control Unit.

Central Processing Unit : General Regsiter Organisation, Stack Organization, Instruction Formats, Addressing Modes Data Transfer and Manipulation, Program Control, Reduced Instruction set Computer, Pipeline and Vector Processing Parallel Processing, Pipelining, Arithmatic Pipeline RISC Pipeline, Vector Processing, Arrays Processors.

Computer Arithmatic : Addition and Subtraction, Multiplication Algorithms, Division algorithms, Floating-point arithmatic Operations, decimal Arithmatic Unit, Decimal Arithmatic Opartions. Input-Output Organization : Peripheral Devices; Input-Output Interface, Asynchronous Data Transfer, modes of Transfer, Priority interrupt, Direct Memory Access (DMA), Input-Output Multiprocessors :

Characteristics of multiprocessors, Interconnection Structures, Interprocessor arbitration, Interprocessor Communication and Synchronization, Cache Coherence.

BSC. - 202 Algorithms and Advanced data Structures

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Trees : Search trees, AVL Trees, threading, Storage Management : Run time storage mangemnt, garbage collection & compaction Sorting techniques : insertion sort, quick sort, merge sort, heap sort, shell sort radix sort, external sort, lower bound for sorting by compression of keys, Selection and adversary argument Traeversal : Minimum spanning tree, shortest path, graph component algorithms, String Matching KMP and Boycr Moore algorithms. Dynamic Programming : Matrix multiplication and Optimal binary search tree algorithms.

NP Complete Problem : complexity classes P and NP, examples of problem in the NP class.

Parallel algorithms : Parallelium, PRAM and other, models, Parallel algorithms finding maximum elelment in a list, merging and sorting.

Data rate of channel : analog and digital communications, asynchronous and synchronous transmission; data encoding techniques : modulation techniques; multiplexing : TI/EI carrier systems; transmission medium; transmission errors, error-detection & correction codes.

Network classification and data communication servicers : Local area networks, metropolyton Area Network, wide area networks, wireless networks, Internetwork; Switched multimegabit Data Service, X.25, Frame Relay; narrowband and broad band ISDN, Asynchranous Transfer Modes.

Networks references models : layered architecture, protocol hierarchies, interface and services; ISO-OSI references model. TCP IP reference model Novel Netware, internet protocol stacks. Data link layer functions and protocols

: framing, error-control flow control, sliding window protocol : HDCL, SLIP and PPP protocol.

Medium Access sublayer : CSMA/ CD & ethernet, token ring, FDDI : IEEE standards for LAN and MAN : state Internetworks TDMA and VSAT.

Introduction to Network Programming.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 203 Microprocessor

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Evolution of microprocessor : Intel series of microprocessors; Motorla seiries of micrprocessors Microprocessor architrecture; Arithmatric and Logic Unit ; Cotrol Unit; General purpose registers; external system bus architecture; example of 8085 microprocessor architecture. Memory Interfacing : memory devices ; memory decoding ; 8085 memory interfacing.

Basic I/O; interfacing I/O; mapped I/O; Memory mapped I/O; I/O port address decoding schemes of 8085; data transfer schemes synchronour, asynchronous, interrupt, programmable; direct Memory Access data transfer, 8255 programable peripheral interafce; 8279 programmable keyboard and display interface; 8253 programmble keyboard and display interface;8253 programmable timer; 8237/8257 DMA controller; interfacing of above chips with 8085 microprocessors. Assembly languages of 8085 microprocessor.

BSC. - 204 Database Systems

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Data Modelling for a database : records and files, abstraction and data integration.

Database Management System : the three level architecture DBMS, Components of a DBMS.

Data Models and thier Implementation Relational, Network, Hierarchial.

Relational Data Manipulations : Relational Algebra, Relational Calculus, SQL.

Relational Database Design Relational Functional Dependencies; Finding keys ; 1st to IIIrd NFs BCNF, Lossless Join and Dependency preserving decomposition, computing closures of setFD's finding keys.

Query Processing : General Strategies for query processing query optimization, query processor.

Concepts of security concurrency and recovery. Database Design Project : definition and analysis of existing systems, prelimnary and final design, testing and implementation, Operation and tunning.

Use of relational DBMS pacakge for class project.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 207 Operating System Organization and Unix.

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Operating systems overview : Operating system as an extended machine & resource manager : Operating systems classfications : Operating systems modes and system calls ; Operating systems architecture.

Processor management functions : process model, hierarchies and implementation; process states and

transitions, multiprogramming multitasking, multithreading: levels of schedulers and scheduling algorithms micro-kernal architecture.

Memory Management functions : memory management of single user operating system; memory management for multi-user operating system position, swapping, paging, segmentation, virtual memory.

Device management functions : I/O devices and controllers interrupt handlers, device independent I/O software user-space I/O sofware; disk scheduling; clock handware software ; terminal input/output software.

File management functions : file naming, structure, types, access mechanisms, attributes and operations, hierarchical directory systems, Directory structures and directory operations; file space allocations; file sharing file locking ; symbolic links; file protection and secuirty; distributed file systems.

Concurrent Programming : sequentia and concurrent process : precedence graph, Bernsterins condition, time dependency and critical code section, mutual exclusion problem; classical process co-ordination problems : deadlock handling, interprocess communication.

This course should be taught in the Context of Unix operating system.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 208 Software Engineering

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Software engineering definition and paradigms, A generic view of Software engineering.

Requirements analysis : Statement of system scope, isolation of top level proceses and entitles and their allocation to physical elements, refinement and review, Analyzing a problem, creating a software specification document, review for correcteness, consistency and completeness.

Designing software soultions : Refining the software Specification Application of fundamental design concept for data, architectural, and proocedural designs using software blue paradigm, creating requirements and quality.

Sofware Implementation : Relationship between design and implementation; implementation issues and programming support envionment; Coding the procedural design; Good coding style and review of correctness and readability.

Software testing : Role of testing and its relationship to quality assurance; Nature and limitation of software testing; Software testing methods.

Software Maintenance : Maintenance as part of software evaluation, reasons for type of maintenance (Perspective adoptive, corrective), designing for maintenatibility, techniques for maintenance.

Comprehensive examples using available software platforms/ case tools, Configuration Management.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 209 Object Oriented Design and Programming

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Introduction to Object Oriented Modelling, Modeling techniques Object Oriented Design,Object design comparison of

methodologies (SA/SD,OMT, USD), Design implementation, Object Oriented langauges, Programming in C++, Application in database, compilers, animation and Business.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 210 Theory of Computation

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Concept of alphabet, string, language, basic operations on language : union, intersection, on complementation, kleene star;regular languages : regular expressions, non-deterministic and determinstic finite automata and their eqivalence, pumping theorem, degsin and implementation of a lexical analyzer generator, context free languages : context free garmmer, deterministic and non- deterministic push down automata, pumping theorems for context free languages, topdown and bottom up parsing techniques, design and implementation of an LALR parser; Models of Computation : Turing Machine and RAM, equivalence of varainace of standard. Turing Machine mode : Universal Turing Machine, solving problems on Turing machines, Turing accetability and Turing decidability, Unsolvability of problems (halting problem and others).

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 301 Data Communication and Networks

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Data Communication : Concepts of data, signal, channel bandwidth, bit-rate and band rate; fourier analysis, maximum data-rate of channel : analog and digital communications, asynchronous and synchronous transmission; data encoding techniques : modulation techniques : multiplexing; TI/EI carrier systems : transmission medium; transmission errors, error detection & correction codes.

Network classfication and data communication services Local area networks, metropolyton Area Network, wide area networks, wireless network Internetwork, Switched Multimegabit Data Service X. 25 Frame Relay; narrow band and broad band ISDN, Asynchranous Transfer Modes.

Network refrence models : layered architecture, protocol hierarchies interface and services; ISO-OSI reference model. TCP/ IP reference model Novel Networe, internet protocol stacks. Data link layer : functions and Protocols : framming, error- control flow control, sliding window protocol : HDCL, SLIP and PPP protocol.

Medium Access sublayer : CSMA/CD & ethernet, token ring FDDI; IEEE standards for LAN and MAN; state litenetworks TDMA and VSAT.

Introduction to Network Programming.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 302 Computer Graphics

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Development of computer graphics : basic graphics system and standards ; Raster Scan and Random Scan graphics; continual refresh and storages displays; display processors and character generators; colour display techniques; frame buffer and Bitbit operations concepts in raster Graphic Points, lines and curves; scan conversion; line- drawing algorithms; circle and ellipse generation; polygon filling; conic-section generation; antialiasing.

Two dimensional viewing ; basic transfomations; co-ordinate systems; windowing and clipping; segments, interactive picture construction techniques; interactive input/output devices, Three-Dimensional concepts; 3-D representations; and transfromations; 3-D viewing; algorithms for 3-D volumes spline curves and surfaces; Fractals, Quadtree & Octree data structures.

Hidden lines, Hidden surfaces, Rendering.

BSC. - 303 Principles of Visual and Windows Programming

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Diagram understanding- Generalized icons. The environment of a window application. Basic concepts of windows Programming. The structure of a windows program. Using child Windows, programming with the graphics device interface Displaying playing Text, Receiving commands and data from user.

Note : The examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 304   Microprocesssor-II

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Advanced microprocessor architecture; Intel 80286/80386/80486/pentium/ro-pentium architecture; Mecintosh Power PC,DEC Alpha-chip; RISC and CISC architecture; pipeline; super-scaler architecture; real and protected modes; virtual 8086 mode.

Programming model : General purpose registers; pointers and index registers; program invisible registers; flags, segment registers; memory/addressing/ addressing de-coding of 32/64 bit microprocessor modes. Advanced memory interfacing; memory address memory paging mechanisms and memory management; Cache memory and Cache controller. Advanced I/O features : 8251 programmable communication interface; Interrupts - Interrupt vector and table, hardware and software interrupts; 8259 programmable interrupt controller; real time clock; TTL RGB graphics controller; Analog RGB graphics controller; shared bus operation.

 The course should be taught in the contact of intel 80286, 80386, 83486, Pentium and its assembly languages.

Note : Examiners are requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 308   Network & Internet Technologies and Applications

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Survey of contemporary Internet technologies. The role, use and implementation of current tools, basic TCP/IP, name space, correctness and protocols. Worldwide Web/ HTML techniques for text, images, links and forms. Indexing methods gopher, WAIS Server side programming, CGI scripts. Security issues, emphasis on understanding, exploring and extending internet technology using Java or Perl.

E.D.I.

Electronics Commerce.

BSC. - 309   Scientific & Statistical Computing

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.

Numericals Methods :

Floating point artithmatic : Basic concept of floating point number system implications of finite precision, illustrations of errors due to round off.

Interpolation Finite difference calculus, polynomial, interpolation Approximation Uniform, discrete least square, polinomial fourior Numerical Integration & Differentitations Interpolatory numerical integration, numerical differentiation.

Solution of non-linear : Bisection, fixed point iteraction, Newton's Reforms Methods.

Solution of ordinary differential equation- Taylor series method, Runge- Wulta method, Euler method.

Random variables and their distributions : Random variables(discrete and continuous), probability density and distributions functions, special distributions (Binomial, Poisson, Uniform, Expotential).

Independent random variables, functions of random variables and theory distribution.

Limit Theorems :Poisson and normal approximations, control limit theorem, Law of large numbers.

Statistical inference : Estimate and sampling, point and interval estimate of hypothesis testing, power of a test, regression.

Note : Examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 310   Multimedia & Applications

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Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.
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Introduction to multimedia technology- computers, communications and entertainment, framework for multimedia systems. M/M devices presentation devices and the user interface, M/M presentation and authoring.

Digital representation of sound and transmission, brief survey of specch recognition and generation, digital video and image compression, JPEG image compression standards, MPEG motion video compression, DVI technology, time-based media repesntation and deliver.

M/M software environments, limitations of workstation operating systems, M/M system services, OS support for continuous media applications, media stream protocol, M/M file systems and information representation, data models for M/M and Hypermedia information.

Application of M/M intelligent M/M system.

Desktop VR, Virtual reality OS, distributed virtual environment system, virtual environment displays and orientation tracking, visually coupled system requirements intelligent VR software systems.

Applications of environments in various fields, such as medical, entertainment, manufacturing, business, education etc.

Note : Examiner is requested to set eight questions in each paper covering the whole syllabus, out of which students will be required to attempt five questions only.

BSC. - 311   Enterpreneurship

<div align="right">

Max. Marks External : 75

(Theory) Internal : 25

Time allowed : 3 hrs.
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Need and significance of Entrepreneurship Development in Global contexts, Entrepreneurship - Cocepts, Process, Experiences and Strategies, Theories of Application of Enterpreneurship.

The Enterpreneurship - myths and misconception, qualities, charactersistics and role demanded of an Enterpreneur, Enterpreneur v/s Professional Managers.

Government Programmes, Policies, Incentive and Institutional Networking for Enterprise setting, Steps of setting new Enterprise, Scanning Business Environment, Sensing Business Opportunity & identifying product.

Business Plan Preparation - Procedure & Steps, Market Survey & Demand Analysis, Growth, Modernization & Expansion of Enterprise.

Corporate Ethics - Nishkama Karma & Sakam Karma. Sucess Management Stress. Stress Management.

Suggested Readings :

1. Enterpreneurship Development by C.B. Gupta & N.P. Srinivasan, Publisher Sultan Chand & Sons.

2. Clarence Danhof, "Observation on Enterpreneurship in Agriculture " in R. Wohl's Change and the Enterpreneur. Harvard University, Cambridge.

3. Behavioral Exercises and Games - manual for trainers, learning suystems, by M.V.Deshpande, P. Mehta & M. Nandami.

4. Product Selection by Prof. H.N. Pathak, Pub. by (NIESBUD), NSIC-PTC Campus, Okhla.

5. Enterpreneurship Development by Dr. S.P. Misra pub by National Institute for Enterpreneurship and small Business Development (NIESBUD NSIC-PTCB Campus, Okhla.

6. DESAI A N : Enterpreneur and environment, Ashish, NEW DELHI.

7. Kumar S A : Enterpreneurship in Small Industry, Discovery, New Delhi.

8. Enterpreneurship Development by Dr. S. Moharana & Dr. C. R. Das, Pub. By RBSA Publishers, Jaipur.

Note : Examiner is requested to set eight questions covering the whole syllabus, out of which the candidates will be required to attempt five questions.