Maharshi Dayanand University Rohtak
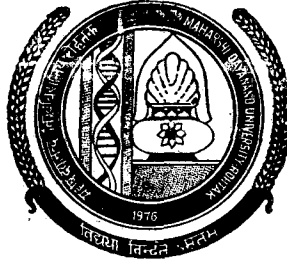

Ordinances, Syllabus and Courses of Reading for B.C.A. I, II & III Distance Examination

Session—2002-2003

Scheme of Examination
of Bachelor or Computer Applications (BCA) through Distance Education

Paper Code	Title of Paper	Max. Marks	Internal Assess- ment.	Exam duration Hours.
FIRST SEMESTER				
BCA-101	Computer Funda- mental and programming	75	25	3
BCA-102	Mathematics-I	75	25	3
BCA-103	Mathematics-II	75	25	3
BCA-104	Business Practices	75	25	3
BCA-105	Practical Software Lab. (based on Paper BCA-101 and Software Tools)	75	25 (Two sittings)	6
SECOND SEMESTER				
BCA-106	Data and File Structure	75	25	3
BCA-107	Structured Systems Analysis	75	25	3
BCA-108	Mathematical Founda- tions of Computer Science	75	25	3
BCA-109	Digital Electronics	75	25	3
BCA-110	Practical Software Lab. (based on Paper BCA-106 and Software Tools)	75	25 (Two sittings)	6
THIRD SEMESTER				
BCA-201	Computer System Architecture	75	25	3
BCA-202	Algorithms and Advance Data Structure	75	25	3
BCA-203	Micro-processors and Assembly Language	75	25	3
BCA-204	Data Base Systems	75	25	3

| BCA-205 | Practical-Software Lab Lab (based on paper BCA-202 and BCA-204) (Two sittings) | 75 | 25 | 6 |

FOURTH SEMESTER

BCA-206	Operating Systems Organisation and UNIX	75	25	3
BCA-207	Software Engineering	75	25	3
BCA-208	Object Oriented Design and Programming	75	25	3
BCA-209	Financial Accounting	75	25	3
BCA-210	Practical-Software Lab Lab (based on paper BCA-206 and BCA-208) (Two Sittings)	75	25	3

FIFTH SEMESTER

BCA-301	Data Communication And Networks	75	25	3
BCA-302	Computer Graphics	75	25	3
BCA-303	Principles of Visual and Windows Programming	75	25	3
BCA-304	On the job training	75	25	3
BCA-305	Practical-Software Lab Lab (based on paper BCA-301, 302 and 303) (Two Sittings)	75	25	6

SIXTH SEMESTER

BCA-306	Internet Technologies and applications	75	25	3
BCA-307	Scientific and Statistical Computing	75	25	3
BCA-308	Multimedia Information Systems	75	25	3
BCA-309	Management information Systems	75	25	3
BCA-310	Practical-Software Lab Lab (based on paper BCA-306,307 & 308) (Two sittings)	75	25	6

BCA FIRST SEMESTER

BCA-101 Computer Fundamentals and Programming

External Marks: 75

Internal Assessment: 25

Time : 03 hrs.

Computer Fundamentals:

Number system: decimal, octal, binary and hexadecimal; Representation of integers, fixed and floating points, character representation: ASCII, EBSDIC; Functional units of computer; I/O devices, primary and secondary memories;

Programming Fundamentals

Algorithm development, Techniques of problem solving, Flow-charting, Step-wise refinement, Algorithms for searching, Sorting (exchange and insertion), merging of ordered lists.

Programming:

Representation of integers, characters, real Data types: constants and varibles; Arithmetic Expressions, Assignment statement, Logical expression, Sequencing, Alteration and iteration; ring processing; Sub programs, Recursion, Files and pointers; Structured programming concepts; Top down Design, Development of efficient programs; program correctness; Debugging and testing of Programs.

Note:- The examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-102   Mathematics-I

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Sets- Set Operations, Application of set theory, Cartesian product, Relations, Functions and classification of function. Sequence, A.P. and G.P.

Trigonometry- System of measuring angles, Trigonometrical functions, identities and signs, values of t-ratio for $\theta = 0$, $\pi/6$, $\pi/4$, $\pi/3$, $\pi/2$. T-ratios of allied angles, Addition and substraction - formulae, transformation of products into sum or difference of t-ratios, transformation of sum or difference into product of t-ratios, Trigonometrical equations and graphs, inverse trigonometrical functions.

Differentiation- Elementary results on limits and continuity (without proof). Derivative of functions, differentiation of implicit functions and parametric forms, Second derivatives, applications of derivative in maxima and minima only.

CO-ordinate Geometry- Distance formulae, Section formulae, Slope of non-vertical line, equation of line in slop-intercept form, normal form, distance of a point from a line, angle between two lines.

Vectors- Derivative of sum, dot and cross product of two vectors, gradient, divergence and curl.

Integral Calculus- Indefinite and definite integral (simple problem), reduction formulae, solution and formation of first order differential equation. Groups, Rings, Fields, Vector-Spaces (definitions and examples).

Note:- Emphasis should be on computer applications. The examiner is requested to set 8 questions covering whole syllabus in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-103 **Mathematics-II**

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Matrices and Determinent, Permutation and combination, Binomial Theorem with examples.

Concepts of countability of sets-supremum & infimum of a set, neighbourhood of a point, interior and limit point of a set.

Sequences- Sequence, convergent sequence, divergent sequences, cauchy sequence, monotonic sequence, subsequence, limit superior, and limit inferior of sequence.

Infinite series- convergence of series, positive term series, comparsion tests, Dalembert's ratio test, Chauchy's nth root test, Raabes test, Gauss's test, Chauchy's integral test, Alternating series, Absolutes and conditional convergence.

Taylor's series, and Maclaurin's series, Applications of Mean value theorem to monotone functions and inequalities, Indeterminate forms.

Note:- 1. The emphasis should be on computer applications

2. The exminer is requested to set 8 questions covering whole syllabus in each paper, out of which the candidates will be required to attempt any 5 questions.

BCA-104   Business Practice

External Marks: 75
Internal Assessment: 25
Time: 03 hrs.

1.   **Introduction to Modern Business.**
What are management function, planning organization, directing and control.

1.   **Introduction to Organization Behaviour.**
Individual in an organization, Group in an organization. Organization as a system.

2.   **Introduction to Human Resource management.**
Human resource Planning- Job analysis, Recruitment and training compensation management-Payroll and incentives. Human Resource information system Computer based employee information system Software package to be used for building an information system for employees, training, recruitment & job analysis A payroll package to be used. Decision analysis: Investment analysis, annuity -analysis, compounding analysis, Inventory Theory-EOQ, JIT Production Scheduling PERT and CPM.

Note:- The examiner is requested to set 8 questions covering whole syllabus in each paper out of which the candidates will be required to attempt any 5 questions.

BCA-105   Practical - Software Lab
(Based on Paper BCA-101 and Software tools)

Second Semester

BCA-106   Data and File Structure

External Marks: 75
Internal Assessment: 25
Time: 03 hrs.

Data Structures
Linear and list structures: Arrays, stacks, queues and lists;

Sequential and linked structures; Simple lists, circular 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. Tree traversal algorithms, threaded trees, binary search trees, trees in search algorithms. B-tree. B + 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. Hashing functions and collision handling methods.

Note:- The examiner is requested to set 8 questions covering whole syllabus in each paper, out of which the candidate will be required to attempt any 5 questions.

BCA-107   Structured Systems Analysis and Design

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External Marks: 75

Internal Assessment: 25

Time: 03 hrs.
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Introduction to systems and contemporary systems Analysis: Effective communication in systems analysis: Tools of the systems Analysis: problem definition, classification data collection and analysis.

Systems planning and alternative, Feasibility and proposal; Use and Management involvement. Planning alternative, design consideration, systems feasibility, selection of a system plan, the system proposal.

System Cost Determination

System 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 design, CRT screen design; Program specification, development completion schedule, Structured Walk Throughs.

Project Management and Control

Development of standards, project 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 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA-108   **Mathematical Foundations of Computer Science**

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Set: Cardinality, counting, operation.

Functions: Boolean functions, permutation functions.

Induction: Principles of Mathematical induction, Fermat's theorem (without proof).

Exponentiation: (How to compute first exponentiation) Advantage of logarithmic algorithms over linear algorithms. "Big Oh" notation: GCD, Euclidean algorithm, Fibonacci numbers, complexity, congruences and equivalence relations, public key encryption schemes.

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

Recursion: Merge sort, Insertion sort, Bubble sort, and Decimal to Binary. Recurrence Relations: LHRR, LHRRWCCs, DCRR

Note:- The examiner is requested to set 8 questions covering the whole syllabus in each paper, out of which the candidates will be rquired to attempt any 5 questions.

BCA-109   **Digital Electronics**

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Fundamentals of electronics devices: Overview of semi-conductors physics, diode and transistor characteristics, diode and transistor as a switch.

Saturated and non-saturated logic, TTL, ECL, MCS, CMCS logic circuits; OR, AND, NOT, EX-OR logic. Positive and negative logic; De Morgan's theorem, Universal building blocks, laws, and theorems of boolean algebra, TTL NAND gates, open collector TTL; wire-or; three state logic; simplifying logic circuits-sum of product and product of sum form, algebraic simplification, karnaugh simplification; arithmetic circuits; flip-flops and multi-vibrator circuits, counter design techniques; counter design techniques; shift registers; encoder, decoder, multiplexor, demulti-plexor circuits; D/A and AD conversion.
Note:- The examiner is requested to set 8 questions covering the whole syllabus in each paper, out of which the candidates will be rquired to attempt any 5 questions.

BCA-110　　Practical- Software Lab
(Based on Paper BCA-106 and Software Tools)
THIRD SEMESTER
BCA-201　　Computer System Architecture

External Marks: 75
Internal Assessment: 25
Time: 03 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:
Instruction and instructions Codes, Computer instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input-Output and Interrupts; Complete Computer Description.

Programming the Basic Computer
Machine Language, Assembly Language, The assembler, program loops, programming Arithmetic and Logic, Subroutines, Inputs-Outputs programming. Micro-programmed Control; Control Memory, Address Sequencing, Micro-programme Example, Design of Control Unit.

Central Processing Unit
General Register Organization Stack Organization Instruction

Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer, Pipeline and Vector Processing parallel processing pipelining, Arithmetic Pipeline, RISC Quoekubem Vector Processing, Arrays Processors.

Computer Arithmetic

Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Point Arithmetic Operations, Decimal arithmetic Unit, Decimal Arithmetic Operations.

Input-Output Organization

Peripheral Devices, Input-Output interface, Asynchronous Data Transfer, Modes of Transfer, Priority interrupt, Direct Memory Access (DMA), input-output processors(IOP), serial communication multi-processors, characteristics of multi-processors, Inter-connection structures, Inter-processor ArBC Aration, Inter-processor Communication and Synchronization, Cache Coherence.

Note:- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be rquired to attempt any 5 questions.

BCA-202   Algorithms and Advanced Data Structures

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Trees: Search Trees, AVL trees, threading;

Storage Management

Run time storage management, garbage collection and compaction.

Sorting techniques

Insertion sort, quick sort, merge sort, heap sort, selection sort, radix sort, external sort; lower bound for sorting by compression of keys. Selection and adversly argument Traversal: minimum spanning tree. Shrotest path, graph component algorithms, String Matching KMP and Boyer Moore algorithms.

Dynamic Programming

Matric multiplication and optional binary search tree algorithms.

NP Complete Problem

Complexity classes P and NP; examples of problems in the NP class.

Parallel Algorithms

Parallelism, PRAM and other models, Parallel algorithms finding maximum element in a list, merging and sorting.

Note:- The examiner is requested to set 8 questions covering the whole syllabus, in each paper, out of which the candidates will be rquired to attempt any 5 questions.

BCA-203   Micro-processor & Assembly Language

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Evolution of micro-processor: overview of intel pro-pentium motorola 68000 series,. power PC, DEC-Alphachip; CISC architecture.

Basic micro processor architecture and interface: Internal architecture, external system bus architecture, memory and input/output interface.

Programming mode

General-purpose registers; pointer and index registers; flag; segment registers, program invisible registers; memory addressing and addressing modes. Memory interfacing; memory address decoding; cache memory and cache controllers.

Basic I/O interface; I/O mapped I/O memory mapped I/O; basic input/output and handshaking input/output port address decoding; 8255 programmable peripheral interface; 8279 programmable keyboard and display interface; 8254 programmable time; 8251 programmable/communication interface; interrupts-interrupt vector, vector tables, hardware and software interrupts, 8259 programmable interrupts controller; real-time clock; direct memory access, 8237/8257 DMA controller; video controllers; shared bus operation.

(This course should be taught in the context of 8085 to intel-pro pentium micro-processor and its assembly languages).

Note: The examiner is requested to set 8 questions covering

the whole syllabus, out of which the candidates will be required to attempt any 5 questions.

BCA-204   Database Systems

> External Marks: 75
> Internal Assessment: 25
> Time: 03 hrs.

Data Modelling for a database: records and files, abstraction and data integration. Database Management System: Relational, Network; Hierarchieal.

Relational Data Manipulations: Relational Algebra, Relational Calculus, SQL. Relational Database Design: Functional Dependencies, Finding Keys: 1st to 3rd NFs, BCNF, Lossess. Join and Dependency preserving decomposition, computing closures of set FDs, 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, Preliminary and final design, Testing and implementation Operation and tunning.

Use of Relational DBMS package for class project.

Note:- The examiner is requested to set 8 questions covering the whole syllabus, out of which the candidates will be required to attempt any 5 questions.

BCA-205   Practical Software Lab.

> (Based on Papers BCA-202 & BCA-204)

FOURTH SEMESTER

BCA-206 Operating Systems Organization and Unix

> External Marks : 75
> Internal Assessment : 25
> Time : 03 hrs

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

Process on Management functions: process model, hierarchies,

and implementation; process states and transitions; multi-programming, multi-tasking, multi-threading; level of schedulers and scheduling algorithms, micro-kernel architecture,

Memory Management functions : memory management of single user operating systems partition, swapping, paging, segmentation, virtual memory.

Device Management function: I/O devices and controllers, interrupt handlers, device independent I/O software, user-space I/O software;disk scheduling; clock hardware software; terminal input/output software. File Management functions; file naming, structure, types, access mechanisms, attributes and operations; hierarchiecal directory systems, directory structures and directory operations; file space allocations; file sharing, file locking; symbolic links; file protection and security: distributed file systems.

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

(This course should be taught in the context of UNIX operating system).

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt only 5 questions.

BCA-207 Software Engineering

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Software engineering definition and paradigms, A generic view of Software Engineering. Requirements analysis, Statement of system scope, isolation of top level processes and entities and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency and completeness.

Designing software solutions: Refining the software specifications: Application of fundamental Design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; creating a design document;l Review of conformance to software requirements and quality.

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

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

Software maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perfective, adoptive, corrective), designing for maintenabiity teachniques for maintenance, Cofiguration management. Comprehensive examples using availble software platform/case tools.

Note:- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt only 5 questions.

BCA-208 Object Oriented Design and Programming

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Introduction to Object Oriented Modeling, modelling techniques, Object Oriented Design, Object design, comparisor of methodologies (SA/SD. OMT, JSD), Design implementation, Object Oriented Languages, Programming in C + +. Applications in database, compilers, animation and Business.

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 209   Financial Accounting

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Conceptual Framework of Accounting : Nature and Scope of Accounting information, Identifying and :

1. Recording accounting transaction using traditional and accounting equations approach. Generally accepted accounting principles. Accounting Standards in India. Bases of accounting - Cash and accrued. Capital and Revenue item.

2. Fundamentals of Computerised Accounting System : Concept of grouping the accounting heads, schemes of assigning the codes to accounting heads, Maintaining the hierarchy of Ledger accounts for perparing control accounts.

3. Applications of computers in accounts :

   a) Accounting procedures used, in practice, for recording Cash, Bank and Journal Transactions using appropriate voucher;

   b) Preparation of Ledger counts, Cash Book, Journal Book and Bank Book;

   c) Preparation of Trial Balance, Profit and Loss Accounts and Balance Sheet;

   d) Accounting for petty Cash transactions and preparation of petty cash register;

   e) Lease and Loan accounting;

   f) Accounting system for preparing and Maintaining Payrolls;

   g) Inventory Accounting and Control;

   h) Budget and Budgetory Control;

   i) Accounting System for Orders booking, Processing (forwarding and acceptance) and invoicing for a trading Organization;

   j) Accounting for Decision making Control : Marginal costing and standard costing.

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 210   **Practical - Software Lab.**

(based on Papers BCA-206 & BCA 207)

FIFTH SEMESTER

BCA-301   **Data Communications & Networks**

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Data Communications : concepts of data, signal , channel, band-width, bid-rate and baud-rate fourier analysis; maximum data-rate of channel; analog and digital communications, asynchronous and synchronous transmission; data encoding techniques; modulation technique; multiplexing; TI/EI carrier systems; transmission medium; transmission errors, error-detection and correction code.

Network Classification and data-communication services; Local area networks metropolyton area network. Wide area networks, wireless network, internetwork, Switched multimega BCA Data Services, X.25, Frame Relay, narrowband and broadband ISDN, Asynchranous Transfer Modes.

Network reference Models : Layered architecture, protocol hierarchies, interface and services; ISC-OSI reference model, TCP/IP reference model; Novel Netware, Internet protocol stacks.

Datalink layer functions and protocols : framing, error-control flow control, sliding window protocol, DHCL SLIP and PPP protocol.

Medium access sublayer: CSMA/CD & ethernet, token ring, FDDI; IEEE standards for LAN and WAN; satelite networks TDMA and VSAT.

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 302   Computer Graphics

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Development of Computer graphics; basic graphics system and standards; Raster Scan and Randod Scan graphics; continual refresh and storages displays; display processors and character generators; colour display techniques; frame buffer and BCA BCA operations concepts in raster graphics. Points, lines and curves; ration; ploygon filling; conic-section generation, antiliasing. Two dimentional viewing; basic transformations; interactive picture construction techniques, interactive inputs/outputs devices.

Three-dimensional concepts; 3-D representations: and transformations; 3-D viewing; algorithm for 3-D volumes spine curve and surfaces; Fractals; Quadtree and Octree data structure. Hidden line and surface, rendering and animation.

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates are required to attempt any 5 questions.

BCA - 303 Principles of Visual and Windows Programming

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Diagram understanding : The symbolic descriptions behind the scenes. Generalized icons; generalizations, formal specifications of iconic systems, iconic operations, Syntactic-semantic analysis of iconic sentences, user-interfaces as iconic systems, determination of iconic purity, a Visual Language complies; The icon dictionary ID Physical logical part of econ, structure of ID, operator dictionary CD; The environment of a window application, Basic concepts of windows programming, The programming with the graphics device interface. Displaying Text, Receiving commands and data from user.

Note :- The examiner is requested to set 8 questions covering the whole syllabus, out of which the candidates will be required to attempt any 5 questions.

BCA - 304 On the job Training

Fundamentals of technical communications, oral and written communication, Preparing oral presentations and supporing materials. Software project documentation of different kinds.

BCA - 305 Practical - Software Lab

(based on Papers BCA-301, 302 and 303)

SIXTH SEMESTER

BCA - 306 Internet Technologies & Applications

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Network Layer functions and protocols : Switching; routing and congestion control; X.25; Internet protocol (IP);

Transport Layer functions and Protocols: addressing flow control, connection management, multiplexing, Transmission control, protocol (TCP) and user datagram protocol (UDP), socket & TLI interface.

Applications layer services and Protocols : domain name services network management protocol, electronic mail and file transfer protocol, world wide webs.

Survey of contemporary Internet Technologies, The Role, use and implementation of current tools. Basic TCP/IP, name, space, correctness, and protocols, worldwide/ HTML Techniques for text, images, links and forms.

Indexing method : gopher, WAIS, Server side programming, CGI scripts, Security issues, Emphasis on understanding, exploring and extending internet technologies using Java or perl.

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 307   Scientific & Statistical Computing

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Numerical methods :

Floating point arithmetic : Basic concept of floating point numbers systems, implications of finite precision, illustrations of errors due to round off.

Interpolation Finite difference calculus, polynomial interpolation. Approximation Uniform, discrete least square, polynomial, fourier.

Numerical Integration & Differentiation Interpolatory numerical integration; numerical differentiation.

Solution of non-liner: Bisection, fixed point iteration, Newton's Repsons Methods.

Solution of Ordinary differential equation - Taylor series, method, Range-Wulta method, Euler method.

Random variables and their distributions: Random variables (discrete and continuous), probability density and distribution functions, speical distributions (Binomial distribution functions, special distributions Poiseon, Uniform Exponential), mean and variance, chebychey inequality, independent random variables, functions of random variables and their distribution. Limit Theorms : Poisson and normal approximations, Control limit Theorm Law of large numbers.

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

Note :- The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 308   **Multi-media Information Systems**

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Introduction to multimedia technology-computers, communications and entertainment; framework for multimedia; M/M devices, presentation devices and the user interface; M/M presentation and authoring.

Digital representation of sound and transmission, brief survey of speech recognition and generation; digital video and image compression; JPEG image compression standard; MPEG motion video compression; DVI technology; time-based media representation and delivery.

M/M Software environments; limitations of workstation operating system; M/M system service; OS Support for continuous media applications; media stream protocol; M/M file systems and information representation; data-media for M/M and Hypermedia information. Applications of M/M; intelligent M/M system. Desktop BR; 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 :-   The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 309   **Management Information System**
                OR Programming Languages

External Marks : 75

Internal Assessment : 25

Time : 03 hrs

Data and information; forms of data; data generation, capturing, collection, recording, retrieval and processing.

Information and Information systems; forms of information systems; Computers in information systems; Computer Based Information System - including Office Automation systems Transaction Processing Systems and Decision Support Systems; Expert Systems.

Role of VBIS in Government; Society and Business organisations. Using Information Systems as a Cost reduction measure in Society. Macros and Micro level information systems. PC based software such as MS-Office, as a micro level information processing tool.

Note :-   The examiner is requested to set 8 questions covering the whole syllabus out of which the candidates will be required to attempt any 5 questions.

BCA - 310   Practical - Software Labs
                (based on Papers BCA-306,307 and 308)