INSTITUTE OF ADVANCED STUDIES IN EDUCATION(DEEMED UNIVERSITY)
GANDHI VIDYA MANDIR
SARDARSHAHR

DETAILED SYLLABUS

FOR DISTANCE EDUCATION

Under Graduate Degree Programmes

BCA

(SEMESTER SYSTEM)

First Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
General English	BCA-110	50	50	100
Fundamentals of Computers & C Language	BCA-120	50	50	100
Mathematics	BCA- 130	50	50	100
PC Software	BCA- 140	50	50	100

Second Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
System Software	BCA –210	50	50	100
OOPS concept with C++	BCA-220	50	50	100
LAB (PC Software & HTML)	BCA- 230 P	00	100	100
LAB(C& C++)	BCA- 240 P	00	100	100

Third Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
Data Structure	BCA-310	50	50	100
Computer System Architecture & Digital Electronics	BCA-320	50	50	100
Operating System	BCA- 330	50	50	100
Java Programming	BCA- 340	50	50	100

Fourth Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
DBMS	BCA –410	50	50	100
Numerical Method & Statistical Method	BCA-420	50	50	100
Lab (Java Programming)	BCA- 430 P	00	100	100
Lab (DBMS)	BCA- 440 P	00	100	100

Fifth Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
Computer Network	BCA –510	50	50	100
Software Engineering	BCA-520	50	50	100
Internet & Web Technology	BCA- 530	50	50	100
. NET Framework & C#	BCA- 540	50	50	100

Sixth Semester

COURSE TITLE	Paper Code	MARKS		
		THEORY	PRACTICAL	TOTAL
Software testing and quality assurance	BCA -610	50	50	100
ELECTIVE	BCA-620	50	50	100
Lab Web Technology	BCA- 630 P	00	100	100
. Net Framework & C #	BCA- 640 P	00	100	100

ELECTIVE

1. BCA-(620) E-I Artificial Intellegence
2. BCA-(620) E-II Computer Graphics
3. BCA-(620) E-III Multimedia

Note:
Theory Paper : 30% Continuous Internal Assessment and 70% University examination.
Practical Paper : 30% Continuous Internal Assessment and 70% University examination

Continuous Internal Assessment:

1) Two or three tests out of which minmum two will be considered for Assessment
60% of Continuous Internal Assessment

2) Seminars/Assignments/Quizzes
30% of Continuous Internal Assessment

3) Attendance, class participation and behaviour
10% of Continuous Internal Assessment

BCA-110 **GENERAL ENGLISH**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**

Total Marks : 100 **Continuous Internal Assessment : 30 Marks**

Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:

The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:

1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Basic Skills :- Listening, Speaking, Reading & Writing.
A Practical study of Grammatical Rules (Noun, Pronoun, Adjectives, Verb, Adverb)
Tenses :- Types of Tenses

SECTION B

Idioms & Phrases,
Confused works :- Paronyms, Homonyms
Synonyms, General Abbreviations,
One word Substitution

SECTION C

Simple present, progressive & present perfect, Simple past, progressive & Past perfect, Indication of Futurity, the passive (Present & Past, Present & Past Perfect).
Reported Speech :-

(I) Declarative Sentences (II) Imperative
(III) Interrogative (Question) (IV) Active, Passive
(V) Preposition (VI) Articles

SECTION D

Writing Skills :-
Paragraph Writing, Composition Writing, Report Writing, Application & Letter Writing, Essay Writing.

Reference:

1. Tandon, R.C. Seth, R.R. Agarwal
2. V.K. Maheshwari - "English Grammar and Composition" Ratan Prakashan Mandir.
3. Sidhu, Prem & Kapoor "Collegiate English Grammar Composition & Translation" Khosla Publishing House.

BCA-120 FUNDAMENTALS OF COMPUTERS & C LANGUAGE

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Basic components of a digital, Classification of Computers, Generation of Computer, Generations of language, Machine level, Assembly.

SECTION B
Number System :- Binary Number System, Decimal, Hexadecimal, Octal Numbers, Conversions, Signed Numbers, Number System Representation (Sign- Boolean Algebra, Truth Table.

SECTION C
O. S. Definition, Function of O.S., Multi-programming & Multitasking, Time sharing, Real Time systems, Network O.S, Distributed O.S.

SECTION D
Tokens, Keywords, Identifiers, Custom Data Types, Operators, Type Costing, Functions, Pass by value, pass by reference, Arrays, Pointer, Structure, Unions, File processing, Pre-processing.

References:

1. Kanetkar, “Let us C”, BPB Publication.
2. E.Balaguru swami, “programming in C”, TMH
3. E. Balaguru Swami, “Programming with C”, TMH

BCA-130 **MATHEMATICS**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Set Theory: Set notations, Operation on sets, Subsets, Venn diagrams, Method of proof for sets, Laws of set theory, Partition of sets, Minsets, Duality principle. Relation: one-to-one, One-to-Many, Many-to-Many relations, onto relations, Inverse relations. Functions: Defining functions, range, domain, functions and relations, Inverse of a function, composite functions. Combinatorics : Rules of products, Permutations, Combinations and Power sets.

SECTION B
Limit continuity, Differentiation :- Derivatives of Polynomial equations, Trigonometric function, Inverse Trigonometric function, Application of Derivatives, Tangent, Normal, Maxima, Minima, Rolle's Trigonometric function, LMV Theorem, Introduction to Partial Derivative.

SECTION C
Integration of polynomial equation, Trigonometric function, Inverse Trigonometric function Standard function, Definite Integral, Limit of Sum method, Area under the curve.

SECTION D
Laws of matrix algebra, System of linear equations, Matrix inversion, Eigen Values, Eigen Vectors, Characteristic equation, Diagonalization.

References:

1. B.S. Grewal & J.S. Grewal, "Higher Engineering Mathematic", Khana Publishers.
2. R.D. Sharma, "Mathematics".

BCA-140 **PC SOFTWARE**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Definition of software, Type of software, Application Software, Definition of system software, Benefits of using software. Window concepts, Features, windows structure, desktop, taskbar, start menu, user interface, GUI, CUI, My computer, Recycle bin, Window Accessories.

SECTION B
Word Procuring :- Ms Word – Introduction to word processing, Interface, Toolbars, Ruler, Menus, Keyboards shortcuts, Editing a document, Formatting documents, Checking the grammars & spelling, Formatting via find and replace, Word Count, Mail merge, Template, macros, Table, Converting a word document into various formats.

SECTION C
Ms- Excel :- Creating worksheet, Entering data into sheets, handling information data, text, data, alphanumeric, values, saving and quitting worksheet, opening and moving around in an existing worksheet, Toolbars and menus, Keyboard shortcuts, Working with single and multiple workbook, Working with formulas cell referencing, formatting of worksheet.

SECTION D
Introduction about Ms Access, Definition of Data, Definition of Data base, Definition of Data base management system.

References:

1. Ramesh Bangia, “Cyber Tech. Educational Series Understating Microsoft 2000”, cybertech.
2. Sanjay saxena, “Ms-Office 2000 for every one ”, Vikas publishing

SECOND SEMESTER

BCA-210 **SYSTEM SOFTWARE**

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Language Processor
Introduction, Language Processing activities, Fundamentals of Language processing fundamentals of language specification.
Data structure for language processing, Search Data Structure of assembler, design of two pass assembler.

SECTION B
Scanning, Parsing, Assembler, Elements of Assembly language programming a simple assembly scheme, pass structure of assembler, design of two pass assembler.

SECTION C
Macro definition and cell, macro expansion, method macro cell, compiler and interpreters aspects of compilation, Memory allocation, completion of Extensions, Compilation of control structures.

SECTION D
Linkers :- Relocation and linking concepts, Design of Linker, Self Relocation program.
Software Tool :- Software Tool for program development, Editors, Debug, Monitors.

References:

1. D. M. Dhamdhere, "System Programming and operating system"(2nd Edition), TMH.
2. Donovan, "System Programming", TMH 1991
3. Aho and ullman, "Principal of compliers", Naroja Publishing House.

BCA-220 OOPS CONCEPTS WITH C++

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
OOP paradigm, Advantage of OOP, Differentiate between functional programming and OOP approach, characteristics of object oriented language object, Definition of class, object, Inheritance, Abstraction, Encapsulation, Dynamic Binding, Manage passing, Polymorphism.

SECTION B
Introduction to C++, Identifier and Keywords, Constants, C++ operator, Type conversion, Variable declaration, Statements expression, condition expression, Loop statement (for, while, do while), break, continue statement.

SECTION C
Array:- Definition of Array, Programming with single dimensional array, 2-D array, multidimensional array, function :- Function declaration, prototyping calling, Friend function, Inline function, Virtual function, call by value, call by reference.

SECTION D
Classes, member function, Objects, nested classes, Inheritance, Function overloading, operator overloading virtual function, files stream, binary file operation, opening & closing file.

References:

1. Yashvant Kanetkar, “Let us C++”, BPB.
2. Robert Lofore, “Object oriented Programming in Turbo C++”, Galgotia publications 1994.
3. Bjarne Strawrup, “The C++ Language”, Addison-Wesley, 1995.

BCA-230 P SOFTWARE LAB - I (PC SOFTWARE & HTML)

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

MS DOS
Concept of files and directories, Basic DOS commands for handling files and directories, Use of wild cards, Batch files, AUTOEXEC.BAT file, Creation of batch files, replaceable parameters, Editing and function keys, DOS editor, Configuring DOS, Role of CONFIG.SYS file.

WINDOWS 98
Installing WINDOWS with set-up, Staring and quitting WINDOWS, Basic elements of WINDOWS, Working with menus dialogue boxes, Window applications, Windows explorer, My Computer, Recycle bin. Programs, Favorites, My Documents.
Settings- Control Panel, Printers, Taskbar and Start menu, Folder Options, Active Desktop. Find, Help, Run.
Accessories – Entertainment, Games, System tools, Internet tools, Calculator, Calendar, Clock, Card file, Notepad, Writepad, Recorder etc.,

MS WORD and POWER POINT
Salient features of MS WORD, Installation of MS WORD, Starting and quitting of MS WORD, File, Edit, View, Insert, Format, Tools, Tables, Window, Help options and all of their features, Options and sub options etc. Transfer of files between MS WORD and other word processors and software packages.
Salient features of POWER POINT, Installation, Starting and quitting, File, Edit, View, Insert, Format, Tools, Slide Show, Window, Help options and all of their features, Options and sub options etc. Transfer of files between POWER POINT and other word processors and software packages.

EXCEL
Spread Sheet. Getting started with Excel worksheet, Entering data into work sheet, Editing cell addressing, Ranges and range names, Commands, Menus, Copying and moving cell contents, Inserting and deleting rows and columns, Column width control, Cell protection, Printing reports, Creating and displaying graphs, Statistical functions.

BCA-240 P **SOFTWARE LAB – II (C & C++)**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-120:(Computer Fundamental and Programming) and BCA220:(C++).

THIRD SEMESTER

BCA-310 **DATA STRUCTURE**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Space and time complexity, Asymptotic notations (Ω,θ, O, ω,$\circ$)
Arrays, Searching Arrays, One Dimension and two Dimensional Arrays. Stack, Infix to Postfix, Postfix Evaluation of Queues, D-Queue, Priority Queue, Singly Link list, Comparison.

SECTION B
Basic concept of Trees, Tree representation by link list and by arrays, Tree reversals, Binary tree, Binary search tree (Insertion, Deletion, Traversals), AVL.

SECTION C
Graph concepts, Adjacency list and adjacency matrix representation, Hamiltonian and Euler's circuit, DFS, BFS, Dijkastra's algorithm, Prims & Kruskal's algorithm.

SECTION D
Linear search, Binary search, Bubble sort, selection sort, Insertion sort, Quick sort, Heap sort, Merge sort, Radix sort, Comparison in turns of space & time complexity.

Reference:

1. Schaum's outlines & Lipschutz, "Data structure", TMH.
2. G.S. Baliya, "Data structure".
3. Schaum's series, "Data structure Algorithms & Applications in C++", TMH.

BCA-320 COMPUTER SYSTEM ARCHITECTURE & DIGITAL ELECTRONICS

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Number system : Binary, Octal, Decimal, Hexadecimal, Number conversions, Arithmetical operations.
Representation of Information : Integer and floating point representation, Number Representation (Sign Magnitude, 1's complement, 2's complement), Character codes (ASCII,EBCDIC, BCD, 8421,2421, Excess-3,Grey, Self complementing codes).

SECTION B
Basic Building blocks : Boolean algebra, K-maps
Combinational logic design : Half-adder/subtractor, full adder/subtractor, parallel adder, Sequential circuits – Concepts, flip-flops (D,RS, JK, Master-Slave, T), Registers (SISO, SIPO, PISO, PIPO), Counters (Ripple, Asynchronous, Synchronous, Decade, Mod-5, Mod-3, Up-down counters)

SECTION C
Control Memory, Address sequencing, Micro-programming, Micro-instruction, Micro programmed and hard-wired control, Arithmetic and Logic unit, Addressing mode.
I/O control: Programmed & Interrupt control mechanisms, I/O controllers, DMA data transfer schemes, strobe & Handshaking.

SECTION D
Pipelining, Arithmetic pipelining speed up, efficiency, Instruction pipelining Memory hierarchy, Associative memory, cache memory, (Associative, direct, Set associative), Write back & write through policy.

Reference:-

1. C.W. Gear, "Computer Organisation and Programming", McGraw-Hill,1975.
2. A. S. Tannenbaum "Structured computer Organisation", Prentice Hall of India.
3. M.M. Mano "Computer system architecture: Prentice Hall of India, 1983.
4. G.Langhoiz, J.Grancioni and A.Kandel, "Elements of Computer Organisation", Prentice-Hall International, 1988.

BCA-330 OPERATING SYSTEMS

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Introduction to operating System, Definition of batch systems, Time sharing systems, Real time systems, Multitasking, Multiprogramming, System services, System calls.

SECTION B
Process management : - Definition of process, Process states, process control block, process creation, process termination, threads, user threads, kernel threads, cooperating processes, Interprocess communication, CPU scheduling, FCFS, SJF, Round robin scheduling, Multilevel queues, multilevel queue with feedback.

SECTION C
Process synchronization, critical section problem, semaphores, Binary semaphores, Deadlocks ;- Necessary condition, prevention, avoidance of deadlock.

SECTION D
Memory Management: Physical V/s Logical address, Dynamic loading, Swapping, Paging, Segmentation, Fragmentation, Virtual Memory, Demand paging, page replacement algorithms.
Disk scheduling (FCFC, SCAN, C-SCAN, LOOK, C-LOOK)

References:

1. A.S. Tanenbaum, "Structured Computer Organisation", PHI, 1990.
2. M.M. Mano, "Computer System Architecture"(2nd Edition), Galgotia Publication.
3. J.P. Hayes, "Computer Architecture and Organisation and Programming", McGraw Hill,1988.

BCA-340 JAVA PROGRAMMING

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Introduction to Java: Features of Java, difference between Java and C++, data types, variables, arrays, operators-arithmetic, bitwise, relational, Boolean, various control statements.

SECTION B
Introduction to Classes: Class fundamentals, declaring objects, methods, constructors, garbage collection, passing parameters to methods, recursion, access control, static, final and finally method, Array One dimensional array, Two Dimensional array multidimensional, Function, Functions Overloading.

SECTION C
Inheritance, super, multilevel hierarchy, abstract methods and classes. Packages and interfaces, importing packages, exception handling. Exception types, try, catch, finally, throw and throws, creating exception subclasses. Multithread programming, thread priorities, synchronization, messaging, creating multiple threads, inter thread communication.

SECTION D
Input/Output, streams, reading and writing console input/output, reading and writing files, applet fundamentals. Networking, socket overview, client/server, reserved sockets, proxy servers, Internet addressing, Java and the Net, TCP/IP client sockets. An introduction to AWT, GUI graphics, fonts, colours.

References:

1. Patrick Naughton and Herbert Schildt, "The Complete Reference Java 2", Tata McGraw Hill, 1999.
2. E. Balaguruswami, "Java Programming", TMH.

FOURTH SEMESTER

BCA-410 DATA BASE MANAGEMENT SYSTEM

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks	**: 40%**		

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Database V/s File system, Architecture of DBMS, Data Independence (Logical Physical) DBA and his responsibility, DBMS structure (DDL Compiler, Data manager, File manager, Disk Manager, Query Processor)

SECTION B
Entity, Entity Set, Attributes Types (Simple & Composite, Single & Multi value, Derived), Relationship, Sets, Mapping cardinalities, Keys(Primary, Secondary, Candidate, Super, Alternate), E-R- Diagram, Hierarchical Model ,Relational Model, Network Model, Object oriented Model.

SECTION C
Anomalies in Design, Functional Dependency, Logical implications, Closure of FD, Cononical Form, Full and Partial FD, Prime and Non-prime attributes, 1-NF, 2-NF, 3-NF, BCNF, Decompositions, lossless and Dependency preservance.

SECTION D
Integrity rules (Entity integrity, Referential Integrity) Union, Difference, Intersection, Cartesian product Division, Projection, Selection, Joins.
Type calculus, Type calculus Formula, Domain calculus, SQL Basic data retrieval, Data manipulation and table study comments, views, SQL queries.

References:

1. Bipin C. Desai, “An Introduction to Data Base Systems”, Galgotia Publication.
2. Elmasri Navathe, “Fundamental of Database Systems” Pearson Edition.

BCA – 420 NUMERICAL METHOD & STATISTICAL METHOD

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Solution of transcendental equation : BI-section method, Regula falsi method, Newton raphson method, and secont method.
System of simultaneously non-linear and alegebric equation :- Gauss elimination method, Gauss seidel alternative method, Gauss Jordan's method, Jacobi's iteration.

SECTION B
Operation, E, $\Delta|$, ∇, Algebric properties of E and $\Delta|$, Relation between operators, differences table, Forward Difference, Backward Diffference, Central difference factorial Notation, Divided Differences, Language's Interpolation formula for unequal intervals.

SECTION C
Numerical Integration :- The trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 weddle's rule.
Numerical solution of ordinary differential equation : Euler's method, Taylor's series, Runge-kutta method.

SECTION D
Introduction to statistics :- Meaning, scope of statistics, Mean, Mode, Median, Standard Deviation, Variance.
Bivariate data :- Correlation, Karl's pearson coefficient, Rank correlation Numerical based on regression lines (using least square method)

Reference:-

1. A. R. Vasishtha, "Numerical Analysis", Publisher John wiley & sons
2. B.S. Grewal, "Engineering Methodic", Khana
3. S.S Sastry, "Numerical Methads"

BCA- 430 P **LAB – III (JAVA PROGRAMMING)**

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-340 (Object oriented Programming in JAVA), All the programs will be implement in JAVA.

BCA- 440 P **LAB – IV (DBMS)**

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-410.

FIFTH SEMESTER

BCA- 510 COMPUTER NETWORKS

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Computer Networks: Uses of Computer Network, Network Hardware, Network Software, Goals and Applications of Computer networks, Computer Network Structure and Architecture.
Reference Models: OSI Reference Model, TCP/IP reference Model, Comparison of OSI and TCP Reference Model, Introduction of Novell Netware, ARPANET.

SECTION B
Local Area Network: IEEE standards 802 for LAN's and MAN's (802.2, 802.3, 802.4, 802.5, 802.6). Bridge-bridges from 802.x to 802.y, transparent bridges, source routing bridges, remote bridges, comparison of 802 bridges, High speed LANs – FDDI, Fast Ethernet, HIPPI, Fibre channel, Satellite network Polling, ALOHA, FDM, TDM, CDM.

SECTION C
The Internet Protocol - Introduction to Internetworking, The IP protocol, IP Addresses, Subnets, Internet Control Protocol, Interior and Exterior gateway routing protocol., internet multicasting mobile IP, CIDR, IPv6.
The Transport Protocol – Elements of transport protocol, A simple transport protocol, TCP-Service model, TCP protocol, Segment header, Connection management, Transmission policy, Congestion control, timer management, UDP.

SECTION D
Internet Applications: Domain Name System, Electronic mail, The World Wide Web, Multimedia - Audio, Video, Data compression, File Transfer Protocol, TFTP, Simple Mail Transfer Protocol, Telnet, HTTP.

References:

1. A.S. Tannenbaum, "Computer Networks", Third Edition, PHI Publications, 1999.
2. D.E. Corner, "Computer Networks and Internets', 2nd Edition, Addison-Wesley Publication, 2000.
3. D.E. Corner and D.L. Stevens, "Inter-networking with TCP_IP : Design, Implementation and Internals", Vol. II, Prentice Hall, 1990.

4. D. Bertsellas and R. Gallager, "Data Networks", 2nd Edition, Prentice Hall, 1992.
5. Stevens W.R. "UNIX Network Programming," Prentice Hall,1990.

BCA-520 SOFTWARE ENGINEERING

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Introduction to Software Engineering: Origin, Definitions and Goals of software engineering, Comparison with traditional Engineering disciplines.
Software development: Phases, Error distribution, Effort distribution, S/W development life cycle: Waterfall and prototype models.

SECTION B
Planning a software project: Team structure (Democratic, Chief programmers and Hierarchical). Software requirement specification: Characteristics & Components of a SRS. Problem Analysis: Structuring Information, DFD's & Data dictionary.

SECTION C
Software Design: Design objectives and principles, Design concepts - Abstraction, Information hiding, Concurrency, Structure: Module level concepts: Coupling, Cohesion. Structured design methodology.

SECTION D
Coding: Programming practices-Top down and Bottom up, Structured programming, Programming style, Internal documentation .
Testing and Testing Fundamentals: Error, Fault, Failure, Reliability, Levels of testing, Test case & Testing criteria, Top down and Bottom up approaches.

References:
1. R.E. Fairley, "Software Engineering Concepts", McGraw-Hill, 1985.
2. P. Jalota, "An Integrated Approach to Software Engineering", Narosa Publishing House, 1992
3. M. Shooman, "Software Engineering", McGraw-Hill, 1983.
4. Boris Beizer, "Software Testing Techniques", Second Edition, Van Nostrand Reinhold, 1990.
5. Roger. S. Pressman, "Software Engineering - A Practitioner's Approach", Third Edition, McGraw Hill, 1992
6. Rajib Mal, "Software Engineering'.

BCA-530 INTERNET & WEB TECHNOLOGY

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Definition of Internet, Internet organisation and committees, Internet, Growth of Internet, Internet- 3, Anatomy of Internet, Internet Application, Portals, Introduction about WWW, Definition of DNS (Domain Name System), IP Addressing.

SECTION B
Types of Network, Topologies, PSTN, PSDN,VAN, ISDN, PDNs, Wide Area Network, Introduction about search engines (Google, Lycos, Gopher etc), Email, Introduction about mail protocol (SMTP, MME)

SECTION C
OSI Reference method, TCP/IP model, FTP, HHTP, HTTPS, Addressing in Internet (Class A,B,C,D,E) Definition of Ethernet, Intranet, Telnet, Wireless communication, Virtual Circuits.

SECTION D
Introduction about HTML, Tag, Types of Tags, Forms, Tables, Images usertion in web page, Introduction about DMTL, CGI.

Reference:-

1. A.S. Tanenbaum, "Computer Networking"(3rd Edition), PHI, 1999
2. D. Betsekas, "Computer Networks", (2nd Edition), PHI, 1992.
3. Prougun, "Data and Communicatio Networks", TMH.

BCA-540 . NETFRAMEWORK AND C#

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.

SECTION A
. Net framework, Common language runtime, Framework Base classes, User and Program Interfaces, Visual Studio. NET, NET languages, Benefits of . NET Application C# and . NET.

SECTION B
Name Spaces, Main Returning a value , Passing string objects write line method. Command line arguments, using mathematics functions, Literals, Variables, Operators, Expressions.
Decision making (if, if…..else, Nested if, else…. If ladder, Switch , ? : Operator) Looping (While, do , for , for each Jumps in loops)

SECTION C
Methods, Parameters, Pass by value, Pass by reference, Methods overloading, Arrays, Strings, Structures, Enumerations, Difference between class & structure.
Classes, access modifiers, accessing class members, constructors, overloaded constructors, copy constructors, destructors.

SECTION D
Classical Inheritance, Containment inheritance, Subclasses constructors, Multilevel, Hierarchical Inheritance, Abstract classes, Defining and Implementation of Interfaces, Interfaces and Inheritances, Overloading unary and binary operators.
Delegates and events, exceptions, multiple caches, finally statement, throwing and own exception.

Reference:-

1. Shibi Panikkar and Kumar Sanjeev, "Magic of C# with .NET FrameWork", Laxmi Publication
2. P. Jalota, "An Intergrated Approach to software Engineering", Narosa Publishing House.

SIXTH SEMESTER

BCA-610 SOFTWARE TESTING AND QUALITY ASSURANCE

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Definition of testing, goals, psychology, model for testing, effective testing, limitations of testing, Definition of testing Definition of failure faults or bug, error incident, test case, test ware, life cycle of bug, bug effects, bug classification, test case design, testing methodology, development of test strategy, verification, validation, testing life cycle mode, testing techniques, testing principles.

SECTION B
Verification activities, verification of requirements, verification of HL design, verification of data design, verification of architectural design, verification of UI design, verification of LL design, intro. to validation activites.

SECTION C
Boundary value analysis, equivalence class portioning, state table based testing, decision table based, grappling, error guessing, Logic coverage criteria, basic path testing, graph matrices, loop testing, mutation testing.

SECTION D
Types of static testing, technical reviews, inspections, inspection process, structured walk through, walk through process, adv. Of static testing, Unit testing drivers stubs, integration testing, methods, effect of module coupling and cohesion, functional testing, system testing, recovery testing, security testing, stress testing, performance testing, usability testing.

Reference:-

1. R.E. Fairley, "Software Engineering Concepts", McGraw-Hill, 1985.
2. P. Jalota, "An Integrated Approach to Software Engineering", Narosa Publishing House, 1992
3. M. Shooman, "Software Engineering", McGraw-Hill, 1983.
4. Boris Beizer, “Software Testing Techniques”, Second Edition, Van Nostrand Reinhold, 1990.
5. Roger. S. Pressman, “Software Engineering - A Practitioner’s Approach”, Third Edition, McGraw Hill, 1992
6. Rajib Mal, “Software Engineering’.

BCA-620 (E-I) Artificial intellegence

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Turing test, characteristic of AI approach for problem solving, problem representation in AI, State space Representation, Problem reduction..

SECTION B
Rearing :- Propositional and predicate logic, POPL, Modes Ponen, Modus tollen, Universal and Esthetical qualifier.
AI searching techniques : Breadth first, Depth first search, Hill climbing, Problem of Hill climbing, Best first search , A*, AO*, Beam Search, Constraint Satisfaction.

SECTION C
Knowledge Representation :- Frames, scripts, Semantic nets, production systems , procedural representation.
Natural language processing :- Need, Problem of NLP, Keyword analysis, syntactic Driver, RTN, ATN.

SECTION D
Expert system :- Characteristic of Expert system, Architecture of ES, Knowledge Base, Inference Engine (Forward & Backward Chaining) Production system, User interface, Knowledge acquisition facility, External Interface.

Reference:
1. D. Hearn & M.P. Baker, "Computer Graphics", (2^{ND} Edition), PHI.

BCA-620 (E-II) **COMPUTER GRAPHICS**

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.

SECTION A
Input device - Keyboard, Touch Panel, Light pens, Graphic tablets, Joysticks, Touch balls, Image scanner, Mouse.
Handy copy device :- Zero impact and Non impact printers, Dot matrix, Laser printer, Inkjet printer, Dectrostate, flatted and drum plotters.

SECTION B
Video display devices :- Cathode ray tube, Resistance, Resolution, aspect ration vertical and horizontal, colour CRT monitors, Direct view storage tube, Flat panel displays, LCD, virtual reality, Faster scan system, random scan system.
Memory device :- Memory (RAM,ROM), CD, Floppy Disk, Magnetic tapes, Magnetic disks.

SECTION C
Scan conversion algorithm for line (DDA, Bresenham's algorithm) midpoint circle, ellipse, two dimensional graphics, Geometric transformation (translation, scaling, relation).

SECTION D
Three dimensional graphics :- Geometric transformation (translation, scaling, rotation) 2-D & 3-D viewing transformation and clipping.

Reference:-

1. O. Hearn and Banes "Computer Graphics".
2. J.O. Foley, A.V. Oom, "Introduction to computer Graphics".
3. Baber, "Computer Graphics".

BCA-620 (E-III) **MULTIMEDIA**

Maximum Time : 3 Hrs. **University Examination : 70 Marks**
Total Marks : 100 **Continuous Internal Assessment : 30 Marks**
Minimum Pass Marks : 40%

(A) Instructions for the Paper setter:
The question paper will consist of five sections: A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 15% of the total marks (12 marks) each. Section E will consist of 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 40% of the total marks (32 marks) in all.

(B) Instructions for the Candidates:
1. Candidates are required to attempt one question each from the section A, B, C and D of the question paper and the entire section E.
2. Use of non-programmable scientific calculator is allowed.

SECTION A
Definition of Multimedia, Multimedia in Business, Multimedia in schools, Multimedia in public places, Introduction to mobbing multimedia (Hardware, Software, Creativity, Organization), Multimedia skills.

SECTION B
Text :- The power of Meaning, About fonts and faces, Using text in Multimedia, Hypermedia and Hypertext.
Sound :- Te power of sound, Digital Audio, Mobbing Midi Audio, Audio file formats, Midi V/s Digital Audio.

SECTION C
Images :- Mobbing still images (Bitmaps, Vector drawing and Rendering) Image file formats.
Animation :- The power of motion principle of Animation, Animation by computers,
Video :- Using video, Analog display standards (NTSC,PAL,SECAM) Digital video, digital display standards.

SECTION D
Basic software tools :- Text editing and word processing tools, OCR software painting and drawing tools, 3-D modeling and animation tool , sound editing tools.
Multimedia authoring tools :- Types of authoring tools, Card and page based authority tools, Icon and ` based authority tools.
Planning and cost :- The process of mobing multimedia, idea analysis, pre-testing, Task planning, prototype development, Alpha Development, Bera Development), Scheduling, Estimating.

Reference:-
1. Tay Vaughan, "Multimedia :- Mobing work by"(7^{Th} Edition), Tata McGrawHILL.

BCA-630 P SOFTWARE LAB – V (WEB TECHNOLOGY)

Maximum Time	**: 3 Hrs.**	**University Examination**	**: 70 Marks**
Total Marks	**: 100**	**Continuous Internal Assessment**	**: 30 Marks**
Minimum Pass Marks : 40%			

Programming in DHTML & XML.

BCA-640 P SOFTWARE LAB – VI (. NET FRAMEWORK AND C#)

Maximum Time	: 3 Hrs.	University Examination	: 70 Marks
Total Marks	: 100	Continuous Internal Assessment	: 30 Marks
Minimum Pass Marks	: 40%		

Programming in C#.