DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 1ST Year 1st Semester

Credit Based Scheme w.e.f. 2013-14

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-101 B	Human Values and Professional Ethics	3	1	-	25	75	-	100	4	3
2.	BCA-103 B	Mathematics - I	3	1	-	25	75	-	100	4	3
3.	BCA-105 B	Personal Computing Software and Hardware	3	1	-	25	75	-	100	4	3
4.	HUM- 501 B	ENGLISH – I	2	1	-	25	75	-	100	3	3
5.	BCA-107 B	Information Technology Fundamentals	3	1	-	25	75	-	100	4	3
6.	BCA-125 B	SOFTWARE LAB.-I (BASED ON BCA-105)	-	-	2	20	-	30	50	1	3
7.	HUM- 503 B	ENGLISH PRACTICE LAB – I	-	-	2	20	-	30	50	1	3
TOTAL			**14**	**5**	**4**	**165**	**375**	**60**	**600**	**21**	

DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 1ST Year 2ndSemester

Credit Based Scheme w.e.f. 2013-14

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-102 B	Digital Circuits and Logic Design	3	1	-	25	75	-	100	4	3
2.	BCA-104 B	Programming in C	3	1	-	25	75	-	100	4	3
3.	BCA-106 B	Mathematics - II	3	1	-	25	75	-	100	4	3
4.	BCA-108 B	Desktop Publishing	3	1	-	25	75	-	100	4	3
5.	HUM- 502 B	ENGLISH – II	2	1	-	25	75	-	100	3	3
6.	BCA-124 B	SOFTWARE LAB.-II (BASED ON BCA-104)	-	-	2	20	-	30	50	1	3
7.	BCA-128 B	SOFTWARE LAB.-III (BASED ON BCA-108)	-	-	2	20	-	30	50	1	3
8	HUM- 505 B	ENGLISH PRACTICE LAB – II	-	-	2	20	-	30	50	1	3
TOTAL			**14**	**5**	**6**	**185**	**375**	**90**	**650**	**22**	

DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 2nd Year 3rd Semester

Credit Based Scheme w. e. f. 2014-15

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-201 B	Programming Languages	3	1	-	25	75	-	100	4	3
2.	BCA-203 B	Computer System Architecture	3	1	-	25	75	-	100	4	3
3.	BCA-205 B	Fundamentals of Database Management Systems	3	1	-	25	75	-	100	4	3
4.	BCA-207 B	Data Structures	3	1	-	25	75	-	100	4	3
5.	BCA-209 B	Information Systems Analysis & Design	3	1	-	25	75	-	100	4	3
6.	BCA-225 B	SOFTWARE LAB.-IV(MS Access) (BASED ON BCA-205)	-	-	2	20	-	30	50	1	3
7.	BCA-227 B	SOFTWARE LAB.-V (BASED ON BCA-207)	-	-	2	20	-	30	50	1	3
	GES – 101 B*	Environmental Studies	3	-	-	-	-	-	-	-	3
TOTAL			**18**	**5**	**4**	**165**	**375**	**60**	**600**	**22**	

***The Environmental studies GES-101 B is compulsory & qualifying course only.**

DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 2ndYear 4th Semester

Credit Based Scheme w.e.f. 2014-15

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-202 B	Operating System	3	1	-	25	75	-	100	4	3
2.	BCA-204 B	Relational Database Management System	3	1	-	25	75	-	100	4	3
3.	BCA-206 B	Introduction to Internet & Web Designing	3	1	-	25	75	-	100	4	3
4.	BCA-208 B	Basic Accounting	3	1	-	25	75	-	100	4	3
5.	BCA-210 B	Object Oriented Programming	3	1	-	25	75	-	100	4	3
6.	BCA-224 B	SOFTWARE LAB.-VI(Oracle/MySQL) (BASED ON BCA-204)	-	-	2	20	-	30	50	1	3
7.	BCA-226 B	SOFTWARE LAB.-VII(HTML/DHTML) (BASED ON BCA-206)	-	-	2	20	-	30	50	1	3
8	BCA-230 B	SOFTWARE LAB.-VIII (BASED ON BCA-210)	-	-	2	20	-	30	50	1	3
TOTAL			**15**	**5**	**6**	**185**	**375**	**90**	**650**	**23**	

DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 3rdYear 5th Semester

Credit Based Scheme w.e.f. 2015-16

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-301 B	Principles of Software Engineering	3	1	-	25	75	-	100	4	3
2.	BCA-303 B	Computer Graphics	3	1	-	25	75	-	100	4	3
3.	BCA-305 B	Data Communication & Networks	3	1	-	25	75	-	100	4	3
4.	BCA-307 B	Visual Programming	3	1	-	25	75	-	100	4	3
5.	BCA-309 B	Web Technologies	3	1	-	25	75	-	100	4	3
6.	BCA-327 B	Software Lab. – IX Based on Sr. No 4 & 5 (VB, ASP .Net)	-	-	2	20	-	30	50	1	3
Total			**15**	**5**	**2**	**145**	**375**	**30**	**550**	**21**	

DeenbandhuChhotu Ram University of Science & Technology, Murthal(Sonepat)

SCHEME OF STUDIES & EXAMINATIONS

Bachelor of Computer Application (BCA) 3rdYear 5th Semester

Credit Based Scheme w.e.f. 2015-16

Sr. No.	Course No.	Course Title	Teaching Schedule			Marks of Class Work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	Practical			
1.	BCA-302 B	E-Business	3	1	-	25	75	-	100	4	3
2.	BCA-304 B	Java Programming	3	1	-	25	75	-	100	4	3
3.	BCA-306 B	System Administration	3	1	-	25	75	-	100	4	3
4.	BCA-308 B	Project	-	-	8	25	-	75	100	4	3
5.	BCA-324 B	Software Lab. – X (BASED ON BCA-304)	-	-	2	20	-	30	50	1	3
6.	BCA-326 B	Software Lab. – XI (BASED ON BCA-306)	-	-	2	20	-	30	50	1	3
Total			**9**	**3**	**12**	**140**	**225**	**135**	**500**	**18**	

BCA-101B : Human Values and Professional Ethics
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1: **Course Introduction – Need, Basic Guidelines, Content and Process for Value Education**:
Understanding the need, basic guidelines, content and process for Value Education. Self Exploration–what is it?- its content and process; "Natural Acceptance and Experiential Validation- as the mechanism for self exploration.Continuous Happiness and Prosperity- A look at basic Human Aspirations.
Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority.
Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario.
Method to fulfill the above human aspirations: understanding and living in harmony at various levels

Unit 2: Understanding Harmony in the Human Being – Harmony in Myself!

Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
Understanding the needs of Self („I") and „Body".
Understanding the Body as an instrument of „I" (I being the doer, seer and enjoyer)
Understanding the characteristics and activities of 'I' and harmony in 'I'
Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail

Unit 3: Understanding Harmony in the Family and Society- Harmony in HumanHuman Relationship

Understanding harmony in the Family- the basic unit of human interaction
Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust and Respect as the foundational values of relationship
Understanding the meaning of Vishwas; Difference between intention and competence
Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship
Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human
Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha)- from family to world family!

Unit 4: Understanding Harmony in the Nature and Existence – Whole existence as Co-existence:

Understanding the harmony in the Nature
Interconnectedness and mutual fulfillment among the four orders of naturerecyclability and self-regulation in nature
Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all-pervasive space
Holistic perception of harmony at all levels of existence

Implications of the above Holistic Understanding of Harmony on Professional Ethics:

Natural acceptance of human values
Definitiveness of Ethical Human Conduct
Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Competence in professional ethics:

-Ability to utilize the professional competence for augmenting universal human order
-Ability to identify the scope and characteristics of people-friendly and ecofriendly production systems
-Ability to identify and develop appropriate technologies and management patterns for above production systems.

Text/Reference Books:

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
3. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.
4. A Nagraj, 1998, JeevanVidyaekParichay, Divya Path Sansthan, Amarkantak.
5. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
6. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
7. A.N. Tripathy, 2003, Human Values, New Age International Publishers
8. SubhasPalekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) KrishiTantraShodh, Amravati.
9. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.
10.E G Seebauer& Robert L. Berry, 2000, Fundamentals of Ethics for Scientists &Engineers , Oxford University Press
11.M Govindrajran, S Natrajan& V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd
12.B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.
13.B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-103 B: Mathematics - I
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit I

Trigonometry: System of measuring angles, Trigonometric functions, identities and signs, Addition and subtraction formulae, transformation of products into sum or difference of t-ratios, transformation of sum or difference into product of trigonometric ratios, Trigonometric equations and graphs.

Unit II

Binomial Theorem: Statement of the binomial theorem for positive integral indices, general and middle term in binomial expansion, simple applications.

Quadratic Equations: Solution of Quadratic Equations by factor method, complete square method, and Discriminant method, Relation of the roots.

Unit III

Co-ordinate Geometry: Distance formulae, section formulae, shifting of origin. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form. General equation of a line.Equation of family of lines passing through the point of intersection of two lines.Distance of a point from a line.

Unit IV

Sequence and Series: Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P. Arithmetic and geometric series, infinite G.P. and its sum, geometric mean (G.M.). Relation between A.M. and G.M.

Text/Reference Books:

1. 11^{th}& 12^{th} NCERT Mathematics books.
2. Elementary Engineering Mathematics- B S Grewal

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-105 B: Personal Computing Software and Hardware
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1:

Computer Appreciation: Introduction, characteristics of computer; History of computers; classification of computers on size, architecture and chronology; Applications of computers; commonly used terms–Hardware, Software, Firmware; Computer Architecture and organisation; Input, Process and Output; Representation of information; BIT, BYTE, Memory, Memory size; Units of measurement of storage; Input/Output devices; Secondary storage devices; Networking concepts - LAN, WAN and Topologies:
Types of software; system and application software; functions of an operating system; Popular
Operating systems; Generation of Languages; Translators - Interpreters, Compilers, Assemblers and their comparison.

Unit 2: DOS and Advanced DOS: Profiling an Operating system; Booting sequence; Operating System files and command Processor file; Definition of a file; File naming; Booting from floppy and HDD; Warm and Cold reboot; Types of DOS commands; Internal and External; Introduction to AUTOEXEC.BAT; Versions of DOS; Directory commands: Copy, XCOPY, DEL, RENAME,
ATTRIB, BACKUP, RESTORE, FIND, SYS; General commands; TYPE, DATE, TIME, PROMPT; Disk organisation and Disk storage.

Unit 3: Disk Management Commands: FORMAT, CHKDSK, DISKCOPY, LABEL, VOL, DISKCOMP, COMP, RECOVER; Redirecting command input and output pipes, study of a line editor and screen editor; Using COPY CON to build a file; Introduction to simple batch files; configuring the system:CONFIG.SYS and AUTOEXEC.BAT files; Setting the Environment; SET Command; System Configuration: FILES, BUFFERS, COUNTRY, DEVICE, SHELL, LASTDRIVE; Batch files commands: ECHO, PAUSE, REM; Batch files with command line arguments; Single and multiple command line parameters; Loop structures in Batch files : IF ERRORLEVEL condition = = condition EXISTS and NOT conditions. GOTO, CALL; Nested Batch Files; preparing Batch files; preparing Batch File Menu Shell; DOS Utility commands: MEMMAKER, MSAV, DBLSPACE, MOVE, DEFRAG, DELTREE, MSBACKUP, SCANDISK, SETVER, UNDELETE, UNFORMAT, XCOPY.

Using Windows: Windows Basics; Start Windows; Using different windows simultaneously; Moving through windows and mouse; Maximize/Minimize windows; Use of help feature; Exit windows; Starting an application; File Management through windows: Copy, Move, Delete files/Directories, Creating Directories. Renaming files and directories; Disk operation Using File Manager, Using Essential Accessories: Starting and using Notepad, Type and Edit text in a document in Notepad/Wordpad, Insert pictures in a document in Notepad /Wordpad, Format text in Notepad/Wordpad document, Save and Print a document file in Notepad/Wordpad, Starting and Using Paint, Printing a drawing.

Unit 4: System Maintenance: Introduction to Various Physical components of a Computer, Physical Inspection of a PC and internal cards, Diagnostics on a PC, Functional description of various modules and cards. Various types of display and other peripherals used in a PC. Installing a software, Detection of viruses and protection on a PC.

Text/Reference Books:

1. Rajiv Mathur : DOS 6.2 Quick Reference, Galgotia, 1995.
2. S.K. Basandra : Computers Today, Galgotia, 1995.
3. Kasser : Using the Internet, PHI, 4th ed., New Delhi.
4. Wall, David A. & Others : Using the World Wide Web, PHI, 2nd ed., New Delhi.
5. B. Govindarajalu IBM-PC and Clones - Hardware Troubleshooting and Maintenance, Tata-McGraw-Hill, 1994.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

HUM- 501 B: ENGLISH – I
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
2	1	-	3	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

OBJECTIVE

To improve students' knowledge of English language and its usage

COURSE CONTENT

UNIT I **20 Marks**

Grammar

Noun phrases; Adjectives: demonstrative, possessive, comparative & superlative; Gerunds and infinitives; Subject-verb agreement

UNIT II **20 Marks**

Vocabulary

Vocabulary of academic world, technology, life stages, sports, emotions, greetings, apologies

UNIT III **15 Marks**

Comprehension

Reading about a wide variety of subjects from history of computers to IT age; understanding important notices and documents in English, such as instructions, rules and regulations, advertisements, invitations; reading articles in English about technical festivals and fairs

UNIT IV **20 Marks**

Composition

Personal text messages and e-mails in English to and from friends and family; How to plan and compose interesting, descriptive writing in English with stress on organisation, content and structure; writing short description of informational and instructional texts in English

RECOMMENDED READING

1. Harmer, Jeremy. *Just Right*. (British edition) Marshall Cavendish, 2007 (Indian distributer: Orient Blackswan/ Viva Books)

2. Grellet, Frangois. *Writing for Advanced Learners of English*. Cambridge Univ. Press, 1996.
3. McCarthy, Michael. *Academic Vocabulary in Use*. Cambridge Univ. Press, 2008.
4. Glendinning, Eric H. and Beverly Holmström. *Study Reading 2nd Edition*. Cambridge Univ. Press, 2004.
5. Hamp-Lyons, Liz and Ben Heasley. St*udy Writing 2nd Edition*. Cambridge Univ. Press, 2006.

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER

Theory

1. The duration of the exam will be 3 hours.
2. The Question Paper for this theory course shall have four questions in all.
3. The student is required to attempt all the four questions.
4. Question no. 1 will be of **20** marks. It will be in the form of 'Do as directed: trace the error, choose the correct alternative, supply the correct alternative/s, putting scrambled sentence/s into order or vice-versa', MCQ etc. covering the Unit I of the syllabus. The emphasis would be on testing the basic conceptual understanding of students regarding Standard English grammar.
5. Question no. 2 covering the Unit II, will be of **20** marks. The question/parts of questions is/are to be designed to evaluate the vocabulary base of student. It may be in the form of 'Do as directed: trace the root, give usage of the word/phrase given, explain meaning of word/s given through sentence construction, elaborate meaning of selective words/phrases from a passage given' etc.
6. Question no 3 based on Unit III will test comprehension competence of the text given. It could be through short answer questions or a long answer question to assess the students' reading comprehension, culling of information, ability to infer and interpret. This question will be of **15** marks.
7. Question no 4 from Unit IV will be of **20** marks. The question may have two parts with internal choice asking student to create a small informational/instructive text on a gadget, process etc or to describe a product/ person/ place or to e-mail a message.

BCA-107 B: Information Technology Fundamentals
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT-1: What are computers? The evolution of computers, Classification of computers, The control unit, computer organization & Block diagram representation, Decimal number system, binary number system, conversion of a binary number to decimal number, conversion of a decimal number to a binary number, addition of binary number, binary subtraction, hexadecimal number system, octal number system

UNIT-2: Storage devices, Input-Output devices, Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software, application software packages

UNIT-3: Operating system concepts, Different types of operating systems, structure of operating system,DOS/UNIX/LINUX commands, Data Processing, File systems and Database Management Systems,different types of Database Management System.

UNIT-4: Basic elements of a Communication System, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Communication protocols, Inter networking tools, Distributed Computing Systems.

Text/Reference Books:

- Alex Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld, 1999.
- P. K. Sinha&PritiSinha , "Computer Fundamentals", BPB Publications, 1992.
- V. Raja Raman, "Introduction to Computers", PHI, 1998.
- Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House,1999.
- Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.
- Simon Haykins, "Communication System", John Wiley & Sons, 1999.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-125 B: Software Lab I (Based on Paper BCA-105, Personal Computing Software and Hardware)
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject "Personal Computing Software and Hardware".

HUM- 503 B: **ENGLISH PRACTICE LAB – I**
Bachelor of Computer Application (B.C.A.) Semester –I

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

OBJECTIVE

To enable students speak English comfortably in a wide variety of day-to-day situations.

COURSE CONTENT

Practice of short simple exchanges like introduction, greetings, requests, apologies; telephone talks and situational dialogues; Vocabulary improvement; Describing people, place, events and things; Composing an e-mail Message; Practice of reading with a purpose, locating main points, making inferences

NOTE: Conversation in English will be mandatory for all the students.

Students are put to practice English language through simulations and practice sessions with the help of language lab software, CDs and BBC's online language learning modules. This drilling method would certainly give them a feel of real life situations and make them confident and comfortable with the basic use of English language.

RECOMMENDED READING

1. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
2. Sadannad, Kamlesh and Susheela Punitha. *Spoken English: A Foundation Course.* Delhi: Orient Longman, 2008

SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 30 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the university's Controller of Exams.

NOTE: **Students will be tested for their oral and written communication competence making them participate in talks, formal exchanges, narrating people, places etc. They may be asked to infer, interpret selected extracts from audio-books/tracks. Students may also be evaluated through a viva conducted by an external examiner.**

BCA-102 B: Digital Circuits and Logic Design
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT - I

Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floating-point representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode.

UNIT - II

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn diagram, Karnaugh Maps.

UNIT - III

Digital Logic: Basic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates –XOR, XNOR etc. NAND, NOR, Combinational Logic – Characteristics, Design Procedures, analysis procedures, Multilevel NAND and NOR circuits.

UNIT - IV

Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-SegmentDecoder.

Text/Reference Books:

1. M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
2. V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hallof India Pvt. Ltd.
3. Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
4. Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-104 B: Programming in C
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT-1: Problem analysis, need for programmed languages, introduction to algorithms, algorithmic representations, flow charts and decision tables, structured programming and modular programming.
Elements of C: C character set, identifiers and keywords, Data types: declaration and definition, Type conversion, Types of error,Preprocessor directives, 'C' macro and macro vs function.
Data input/output. Input/output: Unformatted & formatted I/O function in C, Input functions viz. scanf(), getch(), getche(), getchar(), gets(), output functions viz. printf(), putch(), putchar(), puts().

UNIT-2: Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associativity.
Control statements: Sequencing, Selection: if and switch statement; alternation, Repetition: for, while, and do-while loop; break, continue, goto.
Functions: Definition, prototypes, passing parameters, recursion, Standard library/user-defined functions.

UNIT-3:Arrays and String: defining and processing an array, one dimensional arrays, multidimensional arrays, passing arrays to functions, Handling of character strings
Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays.
Structure and Unions: Defining and processing a structure, user defined data types, structure and Pointers, nested structure, self-referential structures, unions.

UNIT-4: Program structure: Storage classes, automatic, external, and static variables.
Data files: Opening, closing, creating, and processing and unformatted data field. File management in C.
C-programming applications: Sorting (Bubble sort, Selection sort), Searching (Binary search, Linear Search)

Text/Reference Books:

1. Gottfried, Byron S., Programming with C, Tata McGraw Hill
2. Balagurusamy, E., Programming in ANSI C, 4E, Tata McGraw-Hill

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-106 B: Mathematics - II
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit I

Set Theory: Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers. Power set. Universal set. Venn diagrams. Union and intersection of sets.Difference of sets.Complement of a set.

Relation and Functions: Ordered pairs, Cartesian product of sets. Number of elements in the Cartesian product of two finite sets.Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function.Real valued function of the real variable, domain and range of these functions.

Unit II

Determinants: Basic definition, Properties of determinants, Creamer Rule.

Matrices: Definition, addition, subtraction and multiplication of matrices. Computation of inverse (by matrix method).

Unit III

Differentiation: Elementary results on limits and continuity (without proof). Derivative of functions, product rule of differentiation, differentiation of implicit functions and parametric forms.

Integration: Integration of simple functions, integration by parts, integration by partial fraction, definite integration (simple problems only without properties).

Unit IV

Complex Numbers: Definition, Representation of Complex Numbers, Argand plane, Sum, subtraction, product and division of complex numbers, Magnitude, argument and square root of complex numbers.

Statistics: Measure of dispersion; mean deviation, variance and standard deviation of ungrouped/grouped data. Analysis of frequency distributions with equal means but different variances.

Text/Reference Books:

1. 11^{th}& 12^{th} NCERT Mathematics books.
2. Elementary Engineering Mathematics- B S Grewal

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-108 B: Desktop Publishing
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1:

Introduction to the Print Medium

History of print and printing processes, Types of Printing, Letterpress printing, lithography, offset printing, different printing process

Unit 2:

Elements and Principles of Design and Visual Communication

Elements: line, shape, value, texture, color, Principles: harmony, variety, balance, movement, proportion Emergence of graphic design as visual communication

Unit 3:

Photoshop

Introduction to Graphics, Vector Graphics & Bitmaps, Understanding Image Size &resolution , Relation between resolution, File sizes & output, menu & Palettes. Concept of Path (Segment, Anchor, Curved, Closed, Open, Subpath), Photoshop Tools, Concept of Layers, Channels & Path, Filters, Rendering Effects, Transformation, Strokes, Acquiring & Importing Images, Image Modes, Canvas & Images.

Unit 4:

Corel Draw

An overview, menus and tools, Concepts of vector graphics, Color palate, Pasteboard, &. Print Page, Using ruler. Corel Tools (Pick, Shape, Knife, Eraser, Zoom, Freehand, Natural Pen, Dimensions, Ellipse, Polygon etc.). Transformations, Weld, Intersection of Objects, Snapping, Giving effects

Text/Reference Books:

1. HTML & CSS: The Complete Reference, Thomas Powell, Fifth Edition
2. Sams Teach Yourself HTML and CSS in 24 Hours Julie C. Meloni& Michael Morrison, Eighth Edition
3. HTML A Beginner's Guide Wendy L. Willard, Fourth Edition
4. HTML, XHTML and CSS All-In-One For Dummies Andy Harris, Second Edition
5. JavaScript, A Beginner's Guide John Pollock, Third Edition
6. Professional JavaScript for Web Developers (Wrox Programmer) Nicholas C. Zakas, Second Edition

7. Dreamweaver CS5 For Dummies Janine C. Warner, Paperback Edition
8. Adobe Dreamweaver CS5 Bible Joseph Lowery, Paperback Edition
9. The Essential Guide to Dreamweaver CS4 David Powers

Websites:
1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com
4. www.learndreamweavertutorials.com

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

HUM- 502 B: ENGLISH – II

Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
2	1	-	3	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

OBJECTIVE

To provide students with the opportunity to master the language skills necessary for different situations

COURSE CONTENT

UNIT I **20 Marks**

SENTENCE

Clauses: conditional, relative, adverbial; Voice

UNIT II **20 Marks**

WORD

Vocabulary of character description, behaviour, body language, hobbies, friends/enemies, computers.

UNIT III **20 Marks**

SPEECH

Standard pronunciation; Familiarity with different accents: British, American and Indian; Accepting and declining invitations; Making short formal public speeches/talk shows; Making telephonic conversation

UNIT IV **15 Marks**

SOUND

Implications of effective listening; Note-taking; review of TV/Radio talk shows; understand and appreciate the lyrics of a song/ dialogues in a movie in English.

RECOMMENDED READING

1. Lynch, Tony. *Study Listening.* Delhi: Foundation Books (Cambridge University Press), 2004.
2. Gangal, J.K. *A Practical Course in Spoken English*. New Delhi: PHI, 2011
3. Anderson, Kenneth, Joan Maclean and Tony Lynch. *Study Speaking*. CUP, 2004
4. Harmer, Jeremy. *Just Right*. (British edition) Marshall Cavendish, 2007 (Indian distributer: Orient Blackswan/ Viva Books)

5. McCarthy, Michael. *Academic Vocabulary in Use*. Cambridge Univ. Press, 2008.
6. Sinha, R.P. *Current English Grammar & Usage with composition*. Delhi: OUP

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER

Theory

1. The duration of the exam will be 3 hours.
2. The Question Paper for this theory course shall have four questions in all.
3. The student is required to attempt all the four questions.

4. Question no. 1 will be of **20** marks. It will be in the form of 'Do as directed: trace the error, choose the correct alternative, supply the correct alternative/s, putting scrambled sentence/s into order or vice-versa', MCQ etc. covering the Unit I of the syllabus. The emphasis would be on testing the basic conceptual understanding of students regarding Standard English grammar.
5. Question no. 2 covering the Unit II, will be of **20** marks. The question/parts of questions is/are to be designed to evaluate the vocabulary base of student. It may be in the form of 'Do as directed: trace the root, give usage of the word/phrase given, explain meaning of word/s given through sentence construction, elaborate meaning of selective words/phrases from a passage given' etc.
6. Question No 3 based on Unit III of **20** marks may have parts. It will test know how of spoken English such as difference in accents, pronunciation, do's and don'ts of formal speech, structuring a talk etc. It could be through short answer questions to assess the students' comprehension and ability to speak English. This question will be Question no 4 will be of 15 marks covering various components of the Unit IV. The question may have two/three parts with internal choice asking students to interpret the lyrics of a poem/song listened in recent past or to review a talk show/ lecture or theoretical aspect of listening.

BCA-124 B: Software Lab II (Based on Paper BCA-104)
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

1. Write a program to find the largest of three numbers. (if-then-else)
2. Write a program to find the largest number out of ten numbers (for-statement)
3. Write a program to find the average mail height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statements.
5. Write a program using arrays to find the largest and second largest no. out of given 50 nos.
6. Write a program to multiply two matrices.
7. Write a program to read a string and write it in reverse order.
8. Write a program to concatenate two strings.
9. Write a program to sort numbers using the Quicksort Algorithm.
10. Write a program to check that the input string is a palindrome or not.

Note: At least 5 to 10 more exercises to be given by the teacher concerned.

BCA-128 B: Software Lab III (Based on Paper BCA-108)
Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject “Desktop Publishing”.

HUM- 505 B: **ENGLISH PRACTICE LAB – II**

Bachelor of Computer Application (B.C.A.) Semester –II

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

OBJECTIVE

To activate and extend students' linguistic competence for speaking skills

COURSE CONTENT

Practice of self-introduction in standard pronunciation; politely accepting and declining invitations in English; making recommendations in English; Practice of informal discussion, mini formal talk, speeches; Practice of listening to speeches, English songs etc.

NOTE: Conversation in English will be mandatory for all the students.

Students are put to practice English language through simulations and practice sessions with the help of language lab software, CDs and BBC's online language learning modules. This drilling method would certainly give them a feel of real life situations and make them communicate accurately and fluently.

RECOMMENDED READING

1. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
2. Sadannad, Kamlesh and Susheela Punitha. *Spoken English: A Foundation Course.* Delhi: Orient Longman, 2008

SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 30 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the university's Controller of Exams.

NOTE: **Students will be tested for their oral communication competence making them participate in talks, formal exchanges, and self-introduction. They may be asked to infer, interpret speeches/songs in English. Students may also be evaluated through a viva conducted by an external examiner.**

BCA-201 B: Programming Languages
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1: Introduction: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters, Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations, type checking & type conversions, Assignment & initialization, Numeric data types, enumerations, Booleans & characters.
Unit-2: Structured data objects: Structured data objects & data types, specification & implementation of structured data types, Declaration & type checking of data structure, vector & arrays, records Character strings, variable size data structures , Union, pointer & programmer defined data objects, sets, files.

Subprograms and Programmer Defined Data Types: Evolution of data type concept ,abstraction, encapsulation & information hiding , Subprograms ,type definitions, abstract data types.

Unit–3: Sequence Control: Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines, sequence control .
Data Control: Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope.

Unit-4: Storage Management: Major run time elements requiring storage ,programmer and system controlled storage management & phases , Static storage management , Stack based storage management, Heap storage management ,variable & fixed size elements.
Programming Languages: Introduction to procedural, non-procedural ,structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

Text Book:
- **P**rogramming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
- Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH,

Reference Books:
- Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
- Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.,
- Programming Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

GES – 101 B: Environmental Studies
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits
3	-	-	-

UNIT – I The Multidisciplinary nature of environmental studies, Definition, scope and importance. Need for Public awareness

UNIT – II Natural Resources:
Renewable and non-renewable resources: Natural resources and associated problems.
a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.

f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
• Role of an individual in conservation of natural resources.
• Equitable use of resources for sustainable lifestyles.

UNIT-III Ecosystems:
• Concept of an ecosystem.
• Structure and function of an ecosystem.
• Producers, consumers and decomposers.
• Energy flow in the ecosystem.
• Ecological succession.
• Food chains, food webs and ecological pyramids.
• Introduction, types, characteristic features, structure and function of the following ecosystem:
a) Forest ecosystem.
b) Grassland ecosystem.
c) Desert ecosystem.
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT-IV Biodiversity and its conservations:
• Introduction – Definition: Genetic, species and ecosystem diversity.
• Biogeographically classification of India.
• Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
• Biodiversity at global, National and local levels.
• India as a mega-diversity nation.
• Hot-spots of biodiversity.

• Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
• Endangered and endemic species of India.

UNIT – V Environmental Pollution:
Definition, causes, effects and control, measures of:
a) Air pollution
b) Water pollution
c) Soil pollution
d) Marine pollution
e) Noise pollution
f) Thermal Pollution
g) Nuclear hazards

• Solid waste management: Causes effects and control measures of urban and industrial wastes.
• Role of an individual in prevention of pollution.
• Pollution case studies.
• Disaster management: Floods, earthquake, cyclone and landslides.

UNIT – VI Social issues and the Environment:

a) From unsustainable to sustainable development
b) Urban problems related to energy
c) Water conservation, rain water harvesting, watershed management
d) Resettlement and rehabilitation of people; its problems and concerns, case studies
e) Environmental ethics: Issues and possible solutions
f) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust,
Case studies
g) Wasteland reclamation
h) Consumerism and waste products
i) Environment Protection Act
j) Air (Prevention and Control of Pollution) Act
k) Water (Prevention and Control of Pollution) Act
l) Wildlife Protection Act
m) Forest Conservation Act
n) Issues involved in enforcement of environmental legislation
o) Public awareness

UNIT – VII Human population and the Environment,
Population growth, variation among nations,
Population explosion–Family Welfare Programme.
Environment and human health.
Human Rights.
Value Education.
HIV/ AIDS.
Woman and Child Welfare.
Role of Information Technology in Environment and human health.
Case Studies.

Text/Reference Books:

1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .
3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment ®.
8. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env.Institute, Oxford Univ., Press 473p.
9. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment.Cambridge Univ. Press 1140p.
11. Jadhav, H &Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. &Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition 639p.
13. Mhaskar A.K., Mater Hazardous, Tekchno-Sciences Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsoworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. &Dutta, A.K. 1987, Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd., 345p
17. Sharma, B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Sciences (TB).
20. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II EnviroMdiea (R).
21. Trividi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II Enviro
Media (R).
22. Trividi R.K. and P.K. Goel, Introduction to air pollution, Techno Sciences Pub. (TB).
23. Wagner K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelophia, USA 499p.
24. A text bok environmental education G.V.S. Publishers by Dr. J.P. Yadav.
(M) Magazine (R) Reference (TB) Textbook

Note: Examiner will set eight questions taking at least one question from each unit. Students will be required to attempt five Questions. This paper is a qualifying examination.

BCA-203 B: Computer System Architecture
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1: Introduction to Computer Organization: Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept- Von Neumann Architecture. Introduction to Flynn‟sClassificationSISD, SIMD, MIMD Register Transfer and Micro operations- Introduction to Registers, Register Transfer Language, Data movement among Registers and Memory. Micro operations: Introduction to micro operations, Types of micro operations--Logic Operations, Shift operations, Arithmetic and Shift operations. Common Bus System : Introduction to Common Bus System, Types of Buses(Data Bus, Control Bus, Address Bus), 16 bit Common Bus System--Data Movement among registers using Bus.

Unit 2: Basic Computer Instructions- Introduction to Instruction, Types of Instructions (Memory Reference, I/O Reference and Register Reference), Instruction Cycle, Instruction Formats (Direct and Indirect Address Instructions, Zero Address, One Address, Two Address and Three Address Instructions) Interrupt: Introduction to Interrupt and Interrupt Cycle. Design of Control Unit: Introduction to Control Unit, Types of Control Unit (Hardwired & Micro programmed Control Unit). Addressing Modes-Introduction & different types of Addressing Modes.

Unit 3:I/O Organization: I/O Interface Unit, types of ports (I/O port, Network Port, USB port, Serial and Parallel Port), Concept of I/O bus, Isolated I/O versus Memory Mapped I/O. I/O Data Transfer Techniques: Programmed I/O, Interrupt Initiated I/O, DMA Controller and IOP. Synchronous and Asynchronous Data Transfer: Concept of strobe and handshaking, source and destination initiated data transfer.

Unit 4: Stack Organization: Memory Stack and Register Stack Memory organization: Memory Hierarchy, Main Memory (RAM and ROM chips, Logical and Physical Addresses, Memory Address Map, Memory Connection to CPU), Associative Memory, Cache Memory: Cache Memory (Initialization of Cache Memory, Writing data into Cache, Locality of Reference, Hit Ratio), Replacement Algorithms (LRU and FIFO). Cache Memory Mapping Techniques: Direct Mapping, Associative Mapping and SetAssociative Mapping. Harvard Architecture, Mobile Devices Architecture (Android, Symbian and Windows Lite), Layered Approach Architecture.

Text/Reference Books:

1. Computer System Architecture, M.M. Mano, Third Edition, PHI
2. Computer Organization and Architecture, J.P. Hayes, Third Edition, TMH
3. Computer Organization and Architecture, Stallings, Eighth Edition, PHI

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-205 B: Fundamentals of Database Management Systems
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1: Basic Concepts: Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics ofDatabase Approach, advantages and disadvantages of database system, components of database system, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, DBMS users, Advantages and Disadvantages of DBMS, DBMS languages. Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users .

Unit-2: Database System Architecture: Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances. Data Independence – Logical and Physical Data Independence.Classification of Database Management System, Centralized and Client Server architecture to DBMS.
Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

Unit-3:Entity-Relationship Model: Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams, abstraction and integration. Basic Concepts of Hierarchical and Network Data Model, Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations.

Unit-4:Database protection: Recovery, concurrency, security, integrity and control.
Distribute database: Structure of distributed database, design of distributed databases.

Text/Reference Books:

1. Korth, Silberschatz, Database System Concepts, 4th Ed., TMH.
2. Elmasri&Navathe: Fundamentals of Database Systems, 4th Ed., A. Wesley.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-207 B: Data Structures
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT-1: Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff.

UNIT-2: Arrays: Introduction, Linear arrays, Representation of linear array in memory, addresscalculations, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Sparse arrays.Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory,Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linkedlist, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

UNIT-3: Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion.
Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues.

UNIT-4: Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks.
Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

TEXT BOOKS:

1. Seymour Lipschutz, “Data Structure”, Tata-McGraw-Hill.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-209 B: Information Systems Analysis & Design
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT – I

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system,open and closed system, man-made information systems.

System Development Life Cycle: Various phases of system development, Considerations forsystem planning and control for system success. Role of system analyst.

UNIT – II

System Planning: Bases for planning in system analysis: Dimensions of Planning.Investigation: Determining user's requirements and analysis, fact-finding process andtechniques.

Tools of structured Analysis: Data Flow diagram, data dictionary, IPO and HIPO charts, Ganttcharts, pseudo codes, Flow charts, decision tree, decision tables.

Feasibility study: Technical, Operational & Economic Feasibilities.

UNIT – III

Cost/Benefit Analysis: Data analysis cost and benefit analysis of a system.Input/ Output and Form Design, File Organization and database design: Introduction to files anddatabase, File structures and organization, objectives of database design, logical and physical view of data.

UNIT – IV

System testing: Introduction, objectives of testing, test planning, testing techniques.Quality assurance: Goal of quality assurance, levels of quality assurance

System implementation and software maintenance: primary activities in maintenance, reducing maintenance costs.

TEXT BOOKS:

1. Awad M. Elias, "System Analysis and Design", Galgotia Publication.

REFERENCE BOOKS:

1. Igor Hawryszkiewyez, "Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2. Jeffrey L. Whitten, and Lonnie D. Bentey, "Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-225 B: Software Lab IV (Based on Paper BCA-205)
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject "BCA-205" e.g. Create a database and write the programs to carry out the following operation:

- Add a record in the database
- Delete a record in the database
- Modify the record in the database
- List all the records of database in ascending order.

BCA-227 B: Software Lab V (Based on Paper BCA-207)
Bachelor of Computer Application (B.C.A.) Semester –III

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject "BCA-207". List of few programs is as follows:

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only
a) Addition b) Subtraction c) Multiplication d) Transpose
4.Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
5. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
6. Write a program to implement binary search tree

BCA-202 B: Operating System
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT –1:Fundamentals of Operating system: Introduction to Operating System, its need andoperating System services, Early systems, Structures - Simple Batch, Multi programmed,timeshared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems.

UNIT – 2: Process management: Process concepts, Process states and Process Control Block.CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multipleprocessor scheduling.
Deadlocks: Deadlock characterization, Methods for handling deadlocks.

UNIT – 3:Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Inter-process Communications.
Storage Management: memory management of single-user and multiuser operating system,partitioning, swapping, paging and segmentation, virtual memory, Page replacement Algorithms

UNIT – 4:File Management: File concept, access methods, Directory Structure, file protection. Allocation methods: Contiguous, linked and index allocation.

Device Management: Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C-SCAN,LOOK, C-LOOK.

Text/Reference Books:

1. Silberschatz A., Galvin P.B.,and Gagne G., “Operating System Concepts”, John Wiley & Sons.
2. William Stallings, "Operating Systems, "Internals and Design Principles".

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-204 B: Relational Database Management System
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT – I

Relational Model Concepts, Codd's Rules for Relational Model, Relational Algebra:- Selection and Projection, Set Operation, Renaming, Join and Division. Relational Calculus: Tuple Relational Calculus and Domain Relational Calculus.

UNIT – II

Functional Dependencies and Normalization:-Purpose, Data Redundancy and Update Anomalies.Functional Dependencies:-Full Functional Dependencies and Transitive Functional Dependencies, Characteristics of Functional Dependencies. Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF).

UNIT – III

SQL: Data Definition and data types, Specifying Constraints in SQL, Schema, Change statement,Basic Queries in SQL, Insert, Delete and Update Statements, Views.

UNIT – IV

PL/SQL-Introduction, Advantages of PL/SQL, The Generic PL/SQL Block: PL/SQL Execution Environment, PL/SQL Character set and Data Types, Control Structure in PL/SQL, Cursors, Triggers

TEXT BOOKS:

1. Elmasri&Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
2. Ivan Bayross, "SQL, PL/SQL-The Programming Language of ORACLE", BPB Publications 3rd edition.

REFERENCE BOOKS:

1. C. J. Date, "An Introduction to Database Systems", 8th edition, Addison Wesley N. Delhi.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-206 B: Introduction to Internet & Web Designing
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1: Internet Basics:-Introduction to Internet, Internet Services, WWW, Working of Internet, Internet Connection Concepts, Introduction to Internet, DNS working, configuring internet Connection, Connecting LAN to Internet. Single User, Multi User, Server, Workstation, Client Server environment, computer Network, types of Computer Network: LAN, WAN, MAN; Network Topologies.

Unit-2: Web Browsers, Search Engines, Categories of Search Engines, Searching Criterion, Surfing the net, Hypertext Transfer Protocol (HTTP), URL. Other Internet Tools.Online Chatting, Messaging, and Conferencing Concepts, E-Mail mailing lists, UsenetNewsgroup concepts-Reading use net newsgroups, Internet Relay Chat, Instantmessaging, video conferencing.

Unit-3:World Wide Web: Concepts, Web page: static, Dynamic, Active. Scripting languages: Server side, Client Side. Web site development Phases, Web: Designing, Development and Publishing, HTTP, URL registration, browsers, search engines, Web server, Proxy servers.

Unit-4:HTML: Concepts, Structure of HTML documents, HTML Elements - Core attributes, Language attributes, Core Events, Block Level Events. Text Level Events, Linking Basics, Linking in HTML,Images and Anchors, Anchor Attributes, Image Maps, Semantic Linking Meta Information, Image Preliminaries, Image Download issues, Images as Buttons, Introduction to Layout: Backgrounds, Colors and Text, Fonts, Layout with Tables, Advanced Layout: Frames and layers,. Style Sheets, Positioning with Style sheets, Forms, Forms Control, New and emerging Form Elements.

Text/Reference Books:

1. World Wide Web Design with HTML, Xavier, TMH
2. The complete reference – HTML, TMH

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-208 B: Basic Accounting
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit I

Basic Accounting Concepts: Background of Accounting, Introduction, importance and scope, Accounts – Types and classification; basic terms– Capital, Income, Expenditure, Expenses, Assets, Liabilities and application to Problems., Accounting Equation, Double Entry System. Generally accepted accounting principles.

Unit II

Journal and Ledger- Journal and recording of entries in journal with narration; Ledger – Posting from Journal to respective ledger accounts. Basic concepts of purchase book, sales book and cashbook.Trial Balance: Need and objectives; Application of Trial Balance; different types of errors escaped, trial Balance preparation.

Unit III

Final Accounts: Final Accounts without adjustments. Bank Reconciliation Statement: Bank transactions, Preparation of simple bank reconciliation statement.

Unit IV

Sources of raising of capital in corporate undertaking: working Capital and Long term Capital. Application of computers in accounting.

Text/Reference Books:

1. Managerial Accounting, JawaharLal, First Edition
2. Financial Accounting, Dr. R.K. Mittal & M.R. Bansal
3. Basic Accounting, RajniSofat&PreetiHiro, Second Edition
4. Accounting for management, Bhattacharya & Deaden, Paperback Edition, Vikas 1986
5. Financial Accounting (Part I and Part II), R.L Gupta & V.K Gupta
6. Fundamental Accountancy, S.N. Maheshwari
7. Accounting Principal, Antony & Reece, Sixth Edition.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-210 B: Object Oriented Programming
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1

Object Oriented Programming Concepts : Procedural Language and Object Oriented approach, Characteristics of OOP, polymorphism and encapsulation, user defined types.
Getting started with C++: syntax, data types, variables, strings, function, operators, recursion, array and pointer, structure .

Unit-2

Abstracting Mechanism: classes, private and public, Constructor and Destructor, memberfunction, static members.
Memory Management: new, delete, copy constructor, assignment operator

Unit-3

Inheritance and Polymorphism: Derived Class and Base Class, Different types ofInheritance, Overriding member function, Abstract Class, Public and Private Inheritance, Ambiguity in Multiple inheritance , Virtual function, Friend function, Static function, Operator Overloading, function overloading

Unit-4

Exception Handling: Exception and derived class, function exception declaration,unexpected exception, exception when handling exception.Template and Standard Template Library: Template classes, declaration, templateFunctions.
File Handling: Text versus Binary Files, Opening and Closing Files, File Pointers.

TEXT BOOKS:

1. Herbert Schildt: C++ - The Complete Reference, Tata McGraw Hill Publications
2. BalaguruSwamy: C++, Tata McGraw Hill Publications.
3. Balaguruswamy: Object Oriented Programming and C++, TMH.
4. Johnston: C++ Programming Today, PHI.
5. Olshevsky: Revolutionary Guide to Object Oriented Programming Using C++, SPD/WROX.
6. Object Oriented Programming and C++, R.Rajaram, New Age International.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-224 B: Software Lab VI (Based on Paper BCA-204)
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-204. The exercises should be relating with the experiments on Oracle/MySQL.

BCA-226 B: Software Lab VII (Based on Paper BCA-206)
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-206. The exercises should be relating with the experiments on HTML/DHTML.

BCA-230 B: Software Lab VII (Based on Paper BCA-210)
Bachelor of Computer Application (B.C.A.) Semester –IV

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-210. The exercises should be relating with the experiments on C++.

BCA-301 B: Principles of Software Engineering
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT – I

Software Crisis – problem and causes, Software life cycle models: Waterfall, Prototype,Evolutionary and Spiral models.

Software Project Planning: Cost estimation: COCOMO model, Putnam Resource AllocationModel, Risk management, project scheduling, personnel planning, team structure, Softwareconfiguration management, quality assurance, project monitoring.

UNIT – II

Software Requirement Analysis and Specifications: Structured Analysis, Data Flow Diagrams, Data Dictionaries, Entity-Relationship diagrams, Software Requirement and Specifications, Behavioral and non-behavioral requirements.

Software Design: Design fundamentals, problem partitioning and abstraction, design methodology,Cohesion & Coupling, Classification of Cohesiveness & Coupling.

UNIT – III

Coding: Programming style, structured programming.

Software Testing: Testing fundamentals, Functional testing: Boundary Value Analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing: Control flow based and data flow based testing, loop testing;

UNIT – IV

Software testing strategies: unit testing, integration testing, Validation testing, System testing, Alpha and Beta testing.

Software Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.

TEXT BOOKS:

1. Jalote P., “An Integrated approach to Software Engineering”, Narosa.

REFERENCE BOOKS:

1. Sommerville, “Software Engineering”, Addison Wesley.
2. Fairley R., “Software Engineering Concepts”, Tata McGraw Hill.
3. James Peter, W Pedrycz, “Software Engineering”, John Wiley & Sons.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-303 B: Computer Graphics
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1

Graphics Primitives: Application areas of Computer Graphics, Historical background of Computer Graphics, Computer Graphics and Its types.

Display devices: Pixel, Resolution, Aspect Ratio, CRT, Refresh Rate and Interlacing; Frame Buffer, Video Controller, Raster-Scan Systems , Raster-Scan Display, Lookup Table, Color CRT monitors; Random-Scan Displays; Flat Panel Display : LCD, Plasma Panel; Graphics Monitors and workstations; Graphics Input Devices and Hard-Copy Devices

Unit-2

Output Primitives: Line Drawing Algorithms- DDA Algorithm, Bresenham's Algorithm; Circle-Generating Algorithms, Bresenham's Circle Drawing Algorithm; Ellipse-Generating Algorithms;

Unit-3

2-D Geometric Transforms: Translation, scaling, rotation, reflection and shear transformations, composite transformations.

2-D Viewing: The viewing pipeline, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm.

Unit-4

3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces, Quadtree and octree data structure, rendering and animation.

TEXT BOOKS:

1. Donald Hearn and M. Pauline Baker : Computer Graphics, PHI Publications.
2. Plastock : Theory & Problem of Computer Gaphics, Schaum Series.
3. Foley & Van Dam : Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K. : Computer Graphics, Springer-Verleg.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-305 B: Data Communication & Networks
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT-1: Network Concepts: Goals and applications of Data Communication; Network Topologies; types of networks (LAN, MAN, WAN)
Data Communication Concepts: Components of a data communication system; transmission modes; transmission media - guided and wireless media; Transmission modes, multiplexing (frequency division and time division), Switching; Circuit switching, message switching, packet switching

UNIT-2: Network reference models; OSI references model, TCP/IP reference model, comparison of OSI and TCI reference model.
Connection Oriented Networks: X.25, Frame Relay, ATM
Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

UNIT-3:Framing and Error Control: Framing techniques; Error control- error detection & correction: Hamming Method, CRC and checksum etc.
Data Link Control:Acknowledgments; Medium Access Control and LANs: Multiple Access protocols of MAC sub layer - ALOHA, 1-persistent, p-persistent and non-persistent CSMA, CSMA/CD, Collision free protocols, Limited contention protocols,; IEEE Standard 802 for LANs .

UNIT-4: Routing: Deterministic and Adaptive routing; Centralized and distributed routing; shortest-path; Flooding; flow based; optimal; distance vector, link-state, hierarchical; routing for mobile hosts; broadcast and multicast routing;
Congestion control: Principles of congestion control; Traffic shaping; choke packets; load shedding; RSVP.

TEXT BOOKS:

1. Behrouz, Forouzan, Data communications and Networking, Tata Mc-Graw Hill.
2. William Stallings, Data and Computer Communications, Pearson education.
3. Tannenbaum, Computer Networks, PHI.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-307 B: Visual Programming
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1:The VB Integrated Development Environment: Menu Bar, Context Menus, Tool Bar, Project Explorer, Tool Box, Properties Window; Form Designer, Immediate window; Object Browser; Code Editor Window; Form Layout Window; Locals, and Watch Windows, Customizing the Environment.
The VB language and its elements: Variables, Constants, Arrays, Collections, Subroutines, Functions, Arguments, and Control Structures

Unit-2: Concepts of Object based Event Oriented Languages: Method, Statement, Properties and Event; Developing VB Project/ Application; Design the User Interface; User Input Event Handling; Comparison of Visuals and Non-Visuals Architectures.

Unit-3: Visual Basic Building Blocks And Default Controls: Forms, Using Controls, Exploring Properties, Methods and Events, Introduction to Intrinsic Controls, Working With Text, Working With Choices, Special Purpose Controls.
VB Advance Controls: Events, Menu bar, Popup Menus, Tool bar, Message Box, Built-in Dialog Boxes, Creating MDI, Working with Menus.

Unit-4: Visual Basic and Database Programming: Database Models Visual data manager, Data Control -methods, properties, connectivity with database, Data-Bound controls; Working With Remote Data Object (RDO) ,ActiveX Data Object (ADO) data control,

TEXT BOOKS:

1. Visual Basic 6 Programming, Black Book, by stevenHolzer, Dreamtech Press.
2. Programming in Visual Basic - 6 by J C Bradley, A.C. Millspaugh, TMH
3. VB-6 The Complete Reference by Jerke, TMH

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-309 B: Web Technologies
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit-1:Philosophy of .NET: Origin of .NET Technology, Understanding .NET Platform, Benefits and Limitations of .NET, Building Blocks of .NET Framework, .NET Programming Languages, .NET Types and .NET Namespaces.

Unit-2: Visual Studio.NET and its Major Components: Understanding Common Language Runtime(CLR), Common Type System(CTS) and Common Language Specification(CLS), Role of MSIL and Meta data, Managed Code & Unmanaged Code,Interoperatibility

Unit-3:C# Programming: Introduction to C#, Creating a C# program, Types in C#, Classes, Inheritance and Polymorphism, Methods, Statements and Control, Arrays and Strings, Interface, Abstract and Base Classes, Statements and Controls, Exception and Error Handling in C#.

Unit-4:ADO .NET: Comparison of ADO and ADO.NET,Architecture of ADO.Net,.Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Introduction to Data Access with ADO .NET, Components of ADO.NET.

TEXT BOOKS:

1. C#- Ebalaguruswamy,TMH.
2. ASP.NET -Black Book-dreamtech Press
3. Asp.NET-Unleashed-Pearson

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-327 B: Software Lab IX (Based on Paper BCA-307 & BCA-309)
Bachelor of Computer Application (B.C.A.) Semester –V

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-307 & BCA-309. The exercises should be relating with the experiments based on VB, ASP .Net.

BCA-302 B: E-Business
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1: E – Commerce
Electronic Commerce: Definition, aims, process, various types of Electronic Commerce, internet as promoter of E-Commerce, H/W & S/W Requirements for opening your own online business. Basic challenges to E – Commerce, Technological, legal and regulators heads aspects of E-Commerce.

Unit 2: EDI
EDI vs Traditional Systems, EDI enabled procurement process, components of EDI system, EDIImplementation issues

Unit 3: Re – Engineering for Change
Business process re – engineering BPR, Methodology, Planning Methods for change to EC / EDI

Unit 4: Electronic Payment System

Electronic Payment Technology, Online Shopping, Limitations of Traditional Payment Instruments, Electronic or Digital Cash, Electronic Cheques, E-Vallet , Debit Card, Credit Card**,** Secure Electronic Transactions and Firewalls, Firewall security policies, emerging status of E – Commerce in India

Text/Reference Books:

1. Kamlesh K. Bajaj.Debjani Nag, "E – Commerce – The Cutting Edge of Business" Tata McGraw-Hill Education
2. P.T. Joseph (2006), "E-Commerce, An Indian Perspective", 2nd Edition, PHI Learning Pvt. Ltd, New Delhi.
3. Schneider, Gary. (2011), "E-Commerce", 9th Edition, Cengage Learning, New Delhi.
4. Slyke, Craig Van and Bélanger, France (2002), "E-business Technologies: Supporting the Net-enhanced Organization", Wiley India.
5. Dave, Chaffey (2008), "E-Business and E-Commerce Management", Pearson Education India, New Delhi.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-304 B: Java Programming
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

UNIT-1: Java Language Basics: Java's History, Creation of Java, Importance of Java for the Internet, Java's Magic : Byte-code, Its Features Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays.

Object Oriented Concepts: Class and Objects—Class Fundamentals, Creating objects, Assigning object reference variables; Introducing Methods, Static methods, Constructors, Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects, Method overloading.

UNIT-2: Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.
Packages: Defining Package, CLASSPATH, Package naming, Accessibility of Packages, Using Package Members.

UNIT-3: Interfaces: Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together.
Exceptions Handling: Exception , Handling of Exception, Using try-catch , Catching Multiple Exceptions , Using finally clause , Types of Exceptions, Throwing Exceptions

UNIT-4: Multithreading Programming: The Java Thread Model, Understanding Threads, the Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities.
Creating Applets in Java: Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet Display Methods, The HTML APPLET Tag Passing Parameters to Applets.

Text/Reference Books:

1. E. Balaguruswami, Programming with Java, second edition, Tata McGrawHill.
2. Herbert Schildt, The Complete Reference Java 2, fifth edition, Tata McGrawHill.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-306 B: System Administration
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
3	1	-	4	Class Work	:25 Marks
				Examination	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Unit 1:
Introduction to Operating Systems, its needs and services, Simple batch Systems, Multiprogrammed batched systems, Time sharing systems, Parallel systems, Distributed systems and Real-time systems.
Overview of UNIX: History, Features of UNIX, Comparison between UNIX and Windows. Structure of UNIX Kernel, Shell, Command execution.

Unit 2:
UNIX directory system. UNIX Commands : User Access and User ID Commands, Directory commands, Editors Commands, File Manipulation Commands, Security and Protection Commands, Inter-User and Inter-Machine Communication, Process Management Commands I/O Redirection and Piping Commands, Shell Commands and Shell Programming, System Administration Commands, Vi editor, File Handling commands, and grep.

Unit 3:
Administering UNIX Systems: Introduction to System Administration, Functional activities of System Administration - Starting up the system, Maintaining the Super User Login, Shutting down the system, recovering from system crash, Taking backups, Managing disk space, Mounting and Un-mounting file system, Adding and removing users, Changing groups and password, Maintaining security, Monitoring system activity, Accounting of system usage and billing, Setting up remote communication, Installing printers and peripheral devices.

Unit 4:
Shell Programming: Executing a shell program, Study of shell programming as a Language; Wild card characters, Type of statements and Reserved Words, Special Shell parameters. UNIX and Networking: Setting up of DNS, Mail, WWW servers under UNIX

Text/Reference Books:

1. Srirengan, K. : Understanding UNIX, Prentice-Hall of India, 1999.
2. Kernighan, B.W. & Rob Pike : The UNIX Programming Environment, Prentice-Hall of India, 1997.

NOTE: Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

BCA-308 B: Project
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
-	-	8	4	Class Work	:25 Marks
				Practical	:75 Marks
				Total	:100 Marks
				Duration of Exam	: 3 Hrs.

Students will be required to complete an independent software project using their programming skills.

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher)

BCA-324 B: Software Lab X (Based on Paper BCA-304)
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-304. The exercises should be relating with the experiments based on Java Programming.

BCA-326 B: Software Lab XI (Based on Paper BCA-306)
Bachelor of Computer Application (B.C.A.) Semester –VI

L	T	P	Credits		
-	-	2	1	Class Work	:20 Marks
				Examination	:30 Marks
				Total	:50 Marks
				Duration of Exam	: 3 Hrs.

Students are required to attempt at least 10 exercises based on the syllabi of subject BCA-306. The exercises should be relating with the experiments based on System Administration specifically using Linux.