GURU JAMBHESHWER UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR
(Established by State Legislature Act 17 of 1995)
‘A’ Grade NAAC Accredited
<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>Max. Marks</th>
<th>Pass Marks</th>
<th>Exam Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External</td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>BCA-111</td>
<td>Computer &amp; Programming Fundamentals</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-112</td>
<td>PC Software</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-113</td>
<td>Computer-Oriented Numerical Methods</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-114</td>
<td>Logical Organization of Computer</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-115</td>
<td>Mathematical Foundations – I</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-116</td>
<td>Communication Skills</td>
<td>70</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>BCA-117</td>
<td>Lab – I Windows, and Power Point</td>
<td>100</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>BCA-118</td>
<td>Lab – II Word, and Excel</td>
<td>100</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

**Semester - I**
<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>Max. Marks</th>
<th>Pass Marks</th>
<th>Exam Marks</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA-121</td>
<td>‘C’ Programming – I</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-122</td>
<td>Computer  Architecture–I</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-123</td>
<td>Computer-Oriented Statistical Methods</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-124</td>
<td>Mathematical Foundations – II</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-125</td>
<td>Accounting &amp; Financial Management</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-126</td>
<td>Personality Development</td>
<td>70</td>
<td>30</td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-127</td>
<td>Lab – I Programming in ‘C’</td>
<td>100</td>
<td></td>
<td>40</td>
<td>3hrs</td>
</tr>
<tr>
<td>BCA-128</td>
<td>Lab – II Statistical Methods</td>
<td>100</td>
<td></td>
<td></td>
<td>3hrs</td>
</tr>
</tbody>
</table>

**Semester - II**
<table>
<thead>
<tr>
<th>Paper No.</th>
<th>Title of Paper</th>
<th>Max. Marks</th>
<th>Pass Marks</th>
<th>Exam Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA-231</td>
<td>Object Oriented Programming In ‘C++’</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-232</td>
<td>Data Structures – I</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-233</td>
<td>Computer Architecture – I</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-234</td>
<td>Introduction to Data Base System</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-235</td>
<td>Structured System Analysis &amp; Design</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-236</td>
<td>Mathematical Foundations – III</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-237</td>
<td>Lab – I Programming in ‘C++’</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA-238</td>
<td>Lab – II Implementation of Data Structure in ‘C++’</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper No.</td>
<td>Title of Paper</td>
<td>Max. Marks</td>
<td>Pass Marks</td>
<td>Exam Duration</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>External</td>
<td>Internal</td>
<td></td>
</tr>
<tr>
<td>BCA-241</td>
<td>Web Designing – I</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-242</td>
<td>Data Structures – II</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-243</td>
<td>Operating System – II</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-244</td>
<td>Relational Data Base</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-245</td>
<td>Management Information System</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-246</td>
<td>Mathematical Foundations-IV</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-247</td>
<td>Lab – I Web designing using HTML</td>
<td>100</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>BCA-248</td>
<td>Lab – II ORACLE</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper No.</td>
<td>Title of Paper</td>
<td>Max. Marks</td>
<td>Pass Marks</td>
<td>Exam Duration</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td>BCA-351</td>
<td>Artificial Intelligence</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-352</td>
<td>Micro Processor</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-353</td>
<td>Software Engineering</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-354</td>
<td>Computer Networks</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-355</td>
<td>Computer Graphics</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-356</td>
<td>Web Designing – II</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-357</td>
<td>Lab – I Based Upon 352</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCA-358</td>
<td>Lab – II Based Upon 355</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Programming in ‘C++’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper No.</td>
<td>Title of Paper</td>
<td>Max. Marks</td>
<td>Pass Marks</td>
<td>Exam Duration</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------</td>
<td>------------</td>
<td>------------</td>
<td>---------------</td>
</tr>
<tr>
<td>BCA-361</td>
<td>Core Java</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-362</td>
<td>Introduction to Linux</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-363</td>
<td>Internet Technology</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-364</td>
<td>Visual Basic</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-365</td>
<td>Multimedia Technology</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-366</td>
<td>Introduction to .NET</td>
<td>70</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>BCA-367</td>
<td>Major Project</td>
<td>150</td>
<td>50</td>
<td>80</td>
</tr>
</tbody>
</table>
BACHELOR OF COMPUTER APPLICATIONS
SCHEME OF EXAMINATION – FIRST YEAR(w.e.f. 2013-14)
BCA – 111  Computer & Programming Fundamentals

Maximum Marks: 100  
Minimum Pass Marks: 40  
Time: 3 hours  

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT-I
Computer Fundamentals: Definition, Block Diagram along with its components, characteristics & classification of computers, Applications of computers in various fields.
Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, CD, DVD.

UNIT-II
Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.
Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, singleuser & multi-user operating system.
Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software.

UNIT-III
Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.
Techniques of Problem Solving: Flowcharting, algorithms, pseudo code, decision table, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.
Computer Languages: Analogy with natural language, machine language, assembly language, highlevel language, compiler, interpreter, assembler, characteristics of a good programming language.

UNIT-IV
Searching, Sorting, and Merging: Linear & Binary Searching, Bubble, Selection, and Insertion Sorting, Merging.
Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, introduction to internet and its uses.

TEXT BOOKS
2. Dromey, R.G., How to Solve it By Computer, PHI

REFERENCE BOOKS
3. Leon, Alexis & Leon, Mathews, Introduction to Computers, Leon Tech World
4. Rajaraman, V., Fundamentals of Computers, PHI
5. Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P)Ltd.
BCA-112 PC SOFTWARE

Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

UNIT – II


UNIT – III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Table, Validation, Goal Seek, Scenario.

UNIT – IV

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

TEXT BOOKS
1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication

REFERENCES BOOKS
UNIT-I

UNIT-II

UNIT-III
Interpolation and Approximation:

UNIT-IV
Numerical Differentiation and integration: Differentiation formulae based on polynomial fit, pitfalls in differentiation, Trapezoidal & Simpson Rules, Gaussian Quadrature.

REFERENCE BOOKS
1. V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall, India.
BCA-114 LOGICAL ORGANIZATION OF COMPUTER-I

Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT - I

UNIT - II

UNIT - III
Sequential Logic: Characteristics, Flip-Flops, Clocked RS,D type, JK,T-type and Master-Slave flip-flops, State table, state diagram and state equations, flip-flop excitation tables.

UNIT - IV
Sequential Circuits: Designing registers – Serial input serial output (SISO), Serial input parallel output(SIPO), Parallel input serial output(PISO), Parallel input Parallel output(PIPO), and Shift registers. Designing counters-Asynchronous and synchronous binary counters, modulo-n counters and up-down counters.

TEXT BOOKS

REFERENCE BOOKS
BCA – 115 MATHEMATICAL FOUNDATIONS – I

Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT- I

UNIT- II

UNIT- III
Formation of differential equations order and degree of the differential equation. Geometrical approach to the existence of the solution of the differential equation \( \frac{dy}{dx} = f(x, y) \). Ordinary differential equations of first degree and the first order, exact differential equations.

UNIT- IV

REFERENCE BOOKS
3. S.L. Ross : Ordinary differential equations
4. Babu Ram: Discrete Mathematics
5. Shanti Narayana : Differential & Integral calculus
BCA-116 COMMUNICATION SKILLS (ENGLISH)

Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

External: 70
Internal: 30

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT-I
Q 1. One essay type question (with internal choice) from the prescribed text.
Q 2. Five short answer type questions (with internal choice) from the prescribed text.

UNIT-II
Q 3. A comprehension passage from the prescribed text book (Reflection) with five questions at the end.
Q 4. Faxes, e-mails, and text messages composing. This question will carry three parts A, B, and C with questions on all the three above mentioned items.

UNIT-III
Q 5. Grammar questions on the following items: (i) Articles (ii) Preposition (iii) Tenses (iv) Subject verb agreement (v) Voice (vi) Tag questions (vii) Reported speech (viii) Comparatives and superlatives
Q 6. A paragraph of about 150 words on any one of the given topics.

UNIT-IV
Q 7. Official letters / applications (With internal choice)
Q 8. English in situations (for example: greetings, in the post office, catching a train, at a bank, making a telephone call, buying vegetables, at the hospital, on the bus etc.

TEXT BOOKS
1. Reflections by I. P. Anand & Dr. R. K. Malhotra

RECOMMENDED BOOKS:
2. English in Situations by R. O. Neil (OUP)
Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT-I
Overview of C: History of C, Importance of C, Structure of a C Program.
Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant.
Operators & Expression: Arithmetic, relation, logical, bitwise, unary, assignment, conditional operators and special operators. Arithmetic expressions, evaluation of arithmetic expression, type casting and conversation, operator hierarchy & associativity.

UNIT-II
Decision making & looping: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement, For, while, and do-while loop, jumps in loops, break, continue statement.
Functions: Definition, prototype, passing parameters, recursion.

UNIT-III
Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.
Arrays & String in C: Definition, types, initialization, processing an array, passing arrays to functions, Strings & arrays: Definition, types, initialization of string, String I/O, Array of string, String manipulation function: String length, copy, compare, concatenate, search for a substring.

UNIT-IV
Pointers: Introduction, pointer variables, pointer operators, pointer assignment, pointer conversions, pointer arithmetic, pointer comparison, pointer and array, pointers and functions, pointers and string, pointer to pointer, dynamic allocation using pointers.

TEXT BOOKS

REFERENCE BOOKS
2. Yashwant Kanetker, Let us C, BPB.
3. Rajaraman, V., Computer Programming in C, PHI.
4. Yashwant Kanetker, Working with C, BPB.
BCA-122 COMPUTER ARCHITECTURE – I

Maximum Marks: 100
Minimum Pass Marks: 40
External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Arithmetic Unit: Main sub-units – memory data register, accumulator, multiplier quotient register, adder and logic processor, shift counter, status flip-flops. Arithmetic operations – addition and subtraction, shifting, data transfer, multiplication, division, logic operations, storing.
Innovations in Arithmetic Unit: Speed of addition – addition without carries, carry storage adders, carry anticipation, the carry look ahead scheme. Multiplication – multiplication in half words, Booth’s algorithm, multiplication using a power of two radix, multiplication using carry storage adders.

UNIT – II
Memory Systems: Speed imbalance between the arithmetic and memory units, advantages of memory hierarchies, memory interleaving, problems of management of memory hierarchies, operation of virtual memories. Associative memories. Cache memories – operation of the cache, comparison of cache and virtual memory system, schemes for cache organization, word or block replacement, writing into the cache, multilevel caches.

UNIT – III
General Organization and Control: Addressing schemes – one, two and three address schemes, no-address scheme, address modification and index registers, general purpose registers, addressing modes, stack organization, use of stack for evaluation of expressions, interrupt processing, subroutine return, storing local variables, storing parameters, implementation of stacks, stack organized processors.
Register Transfer Language, Microprogramming, implementation of a microprogrammed control, vertical and horizontal microprogramming.

UNIT – IV

TEXT BOOKS:

REFERENCE BOOKS:
BCA-123 COMPUTER-ORIENTED STATISTICAL METHODS

Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

External: 70
Internal: 30

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT-I

Basic Statistics: Measure of Central Tendency, Preparing frequency, distribution table, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Media, Mode.
Measure of Dispersion: Range, Variance and Standard Deviations; Frequency Distributions and Cumulative Frequency Distributions: Moments and Moments Generating Functions.

UNIT-II

Distribution Patterns: Types of Theoretical Probability; Normal Binomial Poisson distribution.
Correlation and Regression: Types of Correlation, Properties of Coefficient of Correlation, Methods of studying Correlation; Aim of Regression Analysis, Kinds of Regression Analysis.

UNIT-III

Tests of significance: Z-test, Student T-test, Chi-square test.
Curve fitting: Method of least squares and Polynomial fit.

UNIT-IV

ANOVA: Meaning, Assumptions, Cochran’s Theorem (only statement), One way classification, ANOVA Table for One-Way Classified Data, Baye's theorem in decision-making, Forecasting techniques.

REFERENCE BOOKS
BCA – 124 MATHEMATICAL FOUNDATIONS - II

Maximum Marks: 100
External: 70
Minimum Pass Marks:40
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT- I

Propositions and logical operators, Truth tables and propositions generated by a set. Equivalence and implications, Laws of logic, Mathematical system, Proposition over a universe, Mathematical induction, Quantifiers

UNIT- II

Binary operations on a non empty set, Groups, Subgroups, Normal Subgroups, Cosets, Factor groups, Rings, Sub rings, Ideals, Factor rings, Prime ideals, Minimal ideal, Fields, direct product of groups, Isomorphism of groups and rings (definitions and examples only)

UNIT- III

Addition and multiplication of matrices, Laws of matrix algebra, Singular and non singular matrices, Inverse of a matrix, Rank of a matrix, Rank of the product of two matrices, Systems of linear equations i.e. AX=0 and AX=B

UNIT- IV

Characteristic equations of a square matrix, Cayley-Hamilton Theorem, Eigen values and eigen vectors, Eigen values and eigen vectors of symmetric skew symmetric, Hermitian and skew – Hermitan matrices, Diagonalization of a square matrix.

REFERENCE BOOKS
1. Babu Ram : Discrete Mathematics
2. Shanti Naryana : A text book of matrices
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT-I


UNIT - II


UNIT - III

Pay roll department, Preparation of Pay roll, Preparation of wage record, Methods of payments of wages, overview of computerized method for payroll preparation.

UNIT - VI

Inventory account and store record, inventory or stock control and cost accounting, Department demand and supply method of stock control. Classification and condition of material Report on material handling. Overview of computerized accounting process – Introduction to accounting system software, their features and some basic operations.

TEXT BOOKS
1. Mazda, Engineering Management, Addisen Wesley
2. Dr. S P Gupta, Management Accounting
Maximum Marks: 100
Minimum Pass Marks: 40
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT- I

Personality & Personal Grooming – A Brief Introduction
Personality and self-concept, Element of Personality, Determinants of Personality, Causes of deranged Personality, Personality Analysis
Grooming, Personal hygiene, Social, Business and Dining Etiquettes, Body language use and misuse, Art of good Conversation, Art of Intelligent Listening.

UNIT- II

Interpersonal Skills & Role playing: Dealing with seniors, colleagues, juniors, customers, suppliers, contract workers, owners etc at work place

UNIT- III

Group Discussion & Presentation skills: Team behavior, how to effectively conduct yourself during GD, do’s and don’ts, clarity of thoughts and its expression
Presentation skills & seminar skills

UNIT- IV

Interviews Preparation: Intent and purpose, selection procedure, types of interviews, Self planning, writing winning resume, knowledge of company profiles, academics and professional knowledge review, update on current affairs and possible questions, time – keeping, grooming, dress code, document portfolio, frequently asked questions and their appropriate answers, self – introduction, panel addressing, mental frame – work during interviews

REFERENCE BOOKS
(3) Im OK, You re OK, by : Thomas A. Harris, Published By : Pan Books, London and Sydney
(4) Pleasure of your Company, by : Ranjana Salgaocar, Published By : Pyramid Publishers, Goa
(5) How to get the job you want, by : Arun Agarwal, Published By : Vision Books, New Delhi
(6) Get That Job, Rohit Anand & Sanjeev Bikhachandani, Harper Collins
UNIT – I
Introduction to C++, C++ standard library, Basics of a typical c++, Environment, header files and name spaces, library files, introduction to objects, and object oriented programming, Encapsulation, access modifiers: controlling access to a class, method, or variable (public, protected, private, packages), other modifiers, polymorphism: overloading, inheritance, overriding methods, abstract classes, reusability.

UNIT – II
Classes and data abstraction: introduction, structure definitions, Accessing members of structures, class scope and accessing class members, initializing class objects: constructors, using default arguments with constructors, using Destructors. Classes: const object and const member functions, object as member of classes, friend functions and friend classes, function overloading.

UNIT – III
Operator overloading: introduction, fundamentals of operator overloading, restrictions on operator overloading, operator functions as class members vs. as friend function, overloading, <<, >> overloading unary operators, overloading binary operators.

UNIT – IV
Inheritance: introduction, inheritance: base and derived classes, protected members, casting base-class Pointers to derived – class pointers, using member functions, overriding base-class members in derived class, public, protected and private inheritance, using constructors and destructors in derived classes, implicit derived-class object to base-class object conversion.

UNIT – V
Virtual function and polymorphism: intro to virtual functions, abstract base classes and concrete classes, polymorphism, new classes and dynamic binding, virtual destructors, polymorphism, dynamic binding.

UNIT – VI
Files and i/o streams: Files and streams, creating a sequential access file, reading data from a sequential file, updating sequential access file, random access files, creating a random access file, writing data randomly to a random access file, reading data sequentially from a random access file.

TEXT BOOKS:
2. Robert Lafore, Object Oriented Programming in C++

REFERENCE BOOKS:
BCA – 232 DATA STRUCTURES – I
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
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, Big-O notation.
Strings: Introduction, Stroing strings, String operations, Pattern matching algorithms.

UNIT – II
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 linked list, Two-way linked list, Garbage collection, Applications of linked lists.

UNIT – III
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 – IV
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

REFERENCE BOOKS
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Computer architecture: unsigned addition, subtraction, multiplication and division algo, 2’s complement addition, subtraction, multiplication algo, floating point numbers addition, subtraction, multiplication and division algos, IEEE 754 floating point standard.

UNIT – II
Interrupt structures: types of Interrupt, Interrupt processing, levels and priorities of interrupts, implementing Interrupt inside the CPU. Instructions set architectures: reduced instruction set computing (RISC): Characteristics if RISC, RISC instruction set, RESC vs CISC.

UNIT – III
Look Ahead & Pipelining: Instruction look ahead, look ahead and look behind, advantages of look ahead systems. Pipelined execution of instruction – operation of pipelines, optimizing a pipeline, speedup due to pipelining, running the pipeline with minimum idling, multifunction pipelines, organization of pipelines in a general purpose computer.

UNIT – IV
Introduction to Parallel Processing: Parallelism in uniprocessor systems, organization of multiprocessor systems, Flynn’s classification, system topologies, MIMD system architectures, communication in multiprocessor systems, fixed connections, reconfigurable connections, routing on multistage interconnection networks, data flow computing.

TEXT BOOKS:

REFERENCE BOOKS:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users.

UNIT – II
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.

UNIT – III
Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams.
Basic Concepts of Hierarchical and Network Data Model.

UNIT – IV
Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

TEXT BOOKS:

REFERENCE BOOKS:
Bunkers 235 STRUCTURED SYSTEM ANALYSIS AND DESIGN
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

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 for system planning and control for system success.
Role of system analyst.

UNIT – II
System Planning: Bases for planning in system analysis: Dimensions of Planning.
Initial Investigation: Determining user’s requirements and analysis, fact finding process and techniques.
Tools of structured Analysis: Data Flow diagram, data dictionary, IPO and HIPO charts, Gantt charts, 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 and database, 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:
BCA-236 MATHEMATICAL FOUNDATIONS – III
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Derivative of functions of defined parametrically, Derivative of Logarithmic exponential, trigonometric, inverse trigonometric and hyperbola functions.
Derivatives of higher orders, Successive differentiation. Leibnitz’s Theorem.

UNIT – II
Tangents and Normals: Length of tangent, suntangent, normal and subnormal. Polar subtangent, polar subnormal, pedal equations.
Taylor’s theorem and Maclaurin’s theorem: Taylors and Maclaurin’s series expansion, indeterminate forms. Functions of more than one variables and its continuity.

UNIT – III
Asymptotes: Cartesian coordinate, intersection of curve and its asymptotes, Asymptotes in polar coordinates.
Multiple points: cusp, nodes and conjugate points, types of cusp, test for concavity and convexity. Points of inflexion.

UNIT – IV
Curvature: radius of curvature for Cartesian, parametric, polar curves. Newton’s method, radius of curvature for pedal curve, tangential polar equation , center of curvature , circle of curvature , code of curvature and evolute.
Tracing of curves in Cartesian, parametric and polar coordinates.

REFERENCE BOOKS:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT – II
Web Publishing: Hosting your Site; Internet Service Provider; Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names; Creating a Website and the Markup Languages (HTML, DHTML);

UNIT – III
Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT – IV
Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

TEXT BOOKS:

REFERENCE BOOKS:
3. Deitel and Goldberg, “Internet and World Wide Web, How to Program”, PHI.
BCA – 242 DATA STRUCTURE – II
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree, m-way search tree, Searching, Insertion and deletion in an m-way search tree, B-trees, Searching, Insertion and deletion in a B-tree, Huffman’s algorithm, General trees.

UNIT – II

UNIT – III
Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV
Files: Introduction Attributes of a file, Classification of files, File operations, Comparison of various types of files, File organization: Sequential, Indexed-sequential, Random-access file. Hashing: Introduction, Collision resolution

TEXT BOOKS

REFERENCE BOOKS
BCA – 243 OPERATING SYSTEMS
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Introduction: Intro to Operating system concepts (including multitasking, multiprogramming, multiuser, multithreading etc.), Types of Operating system: batch Operating system, time sharing Operating system, distributed OS, Network OS, functions and characteristics, historical evolution of Real time systems; various Real time systems services, architecture, system programs and calls.

UNIT – II
Process management: Process concepts, Process scheduling, operation on processes: CPU Scheduling: Scheduling criteria, Scheduling algorithms (FCFS, SJF, Priority scheduling), Round robin, Multiple queue scheduling

UNIT – III
Memory management: Logical and physical address space, swilling, contiguous memory allocation, Non contiguous paging and segmentation techniques, segmentation with paging, virtual memory management, demand paging, page replacement algorithms, demand segmentation.

UNIT – IV
File system: Different types of files and their access methods, directories structures, various allocation methods, disk scheduling and management and its associated algo, intro to distributed file system.

UNIT – V
Process synchronization & deadlocks: critical section problems, semaphores, method for handling deadlocks, deadlock prevention, avoidance & detection, deadlock recovery.

TEXT BOOKS:

REFERENCE BOOKS:
BCA – 244 RELATIONAL DATA BASE MANAGEMENT SYSTEM

Maximum Marks: 100
External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

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.

TEXT BOOKS:

REFERENCE BOOKS:
BCA – 245 MANAGEMENT INFORMATION SYSTEM
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

UNIT – II

UNIT – III

UNIT – IV
Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

TEXT BOOK:

REFERENCE BOOK:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Partial derivatives of first and second order. Euler’s theorem on homogeneous functions.
Differentiation of composite and implicit functions.
The notion of total differential, Extreme values: Maxima and Minima of function of two or more variable, Lagrange’s method of multiplier.

UNIT – II
Reduction formula, rectification of curve represented in Cartesian, parametric and polar forms, intrinsic equation of curve.

UNIT – III
Quadrature: area of curves and area of surfaces of solid of revolution in Cartesian, parametric and polar forms.
Jacobian, Double and Triple integration, substitution method for double and triple integrals, Application of double and triple integrals for finding volume and surfaces.

UNIT – IV
Beta and Gama functions, their properties and relationships. Differentiation under integral sign.
Equation and simple properties of spheres, cones, cylinders.

REFERENCE BOOKS:
BACHELOR OF COMPUTER APPLICATIONS
SCHEME OF EXAMINATION – THIRD YEAR (w.e.f. 2013-14)
UNIT - I
Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.
Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem
Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction [No. of Hrs.: 11]

UNIT - II
Knowledge representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation
Using Predicate Logic : Representing Simple Facts in logic, Representing instances and isa relationship, Computable function and predicate. [No. of Hrs.: 12]

UNIT - III
Natural language processing : Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing
Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example - induction, Explanation based learning [No. of Hrs.: 11]

UNIT - IV
Expert System: Introduction, Representing using domain specific knowledge, Expert system shells,
LISP and other AI Programming Language [No. of Hrs.: 10]

Text Book:
BCA 352: Microprocessor

Maximum Marks: 100
Minimum Pass Marks: 40
Credits: 4
Time: 3 hrs

Note: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of at least seven objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions carry equal marks

UNIT - I
Introduction to Microprocessors, microcontrollers and microcomputers, Study of 8085 8 bit Microprocessor, pin-out, its internal architecture, addressing modes, 8085 Microprocessor complete instruction set and timing. Arithmetic, logic, branch instructions, programming techniques - looping, counting, indexing, stacks and subroutines, code conversion, BCD Arithmetic.

UNIT - II
Counters and time delays using programming, Software development systems and assemblers, writing complete programs for 8085. Basic interfacing concepts, interfacing memory, interfacing keyboards and output displays, memory mapped and isolated I/O. Interrupts and their processing, 8259, Interrupt interface circuits using 8259.

UNIT - III
General purpose programmable peripheral devices-8255,8253 programmable interval timer, 8257 DMA controller, serial I/O and data communication, RS-232C standard, Serial I/O lines, 8251A Programmable communications interface.

UNIT - IV
Introduction to 8086/8088 microprocessors, pin-out, architecture, segmented memory, timing diagrams, addressing modes, instruction set. Comparison of 8085, 8086, 8088 microprocessors

TEXT BOOKS:

REFERENCE BOOK:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

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 Allocation Model, Risk management, project scheduling, personnel planning, team structure, Software configuration management, quality assurance, project monitoring.

UNIT – II
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:

REFERENCE BOOKS:
BCA – 354 COMPUTER NETWORKS
Maximum Marks: 100 External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model; Example Networks: The Internet, X.25, Frame Relay, ATM;

UNIT – II
Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service;

UNIT - III
Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth; Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways;

UNIT – IV
Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking; Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric –Key Algorithms; Public-Key Algorithms;

TEXT BOOKS:

REFERENCE BOOKS:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Overview of Computer Graphics: Historical background of Computer Graphics; Applications of Computer Graphics; Popular Graphics Softwares; Display devices: Pixel, Resolution, Aspect Ratio; Raster-Scan Systems and Display : CRT, Refresh Rate and Interlacing; Bit Planes, Color Depth and Color Palette, Frame Buffer, Video Controller, Raster-Scan Display Processor, Lookup Table, RGB Color Model, Color CRT monitors; Random-Scan Displays; Flat Panel Display : LCD, Plasma Panel; Graphics Monitors and Workstations; Popular Graphics Input Devices; Hard-Copy Devices;

UNIT – II
Coordinate Representations; Graphics Primitives: Line Drawing Algorithms- DDA Algorithm, Bresenham’s Algorithm; Different Line Styles; Circle-Generating Algorithms- Properties of Circles, Circle Drawing using Polar Coordinates, Bresenham’s Circle Drawing Algorithm; Ellipse-Generating Algorithms; Anti-aliasing;

UNIT – III
Geometric Transformations: Scaling, Translation, Rotation; Matrix Representations and Homogeneous Coordinates; Rotation Relative to an Arbitrary Point; Reflection; Shearing; Coordinate Transformation; Inverse Transformation; Affine Transformation; Raster Transformation; Composite Transformations; Fixed-point Scaling; Input Techniques: Pointing, Positioning, Rubber-band method, Dragging;

UNIT – IV
Two-Dimensional Viewing: Window-to-Viewport Coordinate Transformation; Zooming; Panning; Clipping: Point Clipping, Line Clipping- Cohen-Sutherland line clipping, Mid-point Subdivision Line Clipping; Polygon Clipping – Sutherland-Hodgeman Polygon Clipping; Text Clipping; Graphics in Three Dimensions: Displays in Three Dimensions, 3-D Transformations; 3-D Viewing : Viewing Parameters, Projections, Parallel and Perspective projection; Hidden Surfaces: Z-Buffer Method, Painter’s Algorithm;

TEXT BOOKS:

REFERENCE BOOKS:
**BCA-356 Web DESIGNING – II**

**Maximum Marks: 100**  
**External: 70**  
**Internal: 30**  
**Time: 3 hours**

**Note:** Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

**UNIT – I**
Brief Introduction to Interactivity tools: CGI; Features of Java; Java Script; Features of ASP; VBScript; Macromedia Flash; Macromedia Dreamweaver; PHP;

**UNIT – II**
Introduction and Features of Adobe Photoshop; Microsoft FrontPage Introduction; Features; Title Bar; Menu bar; FrontPage Tool Bar; Style, FontFace andFormatting Bar; Scroll Bars;

**UNIT – III**
Introduction to DHTML and its features; Events; Cascading Style Sheets: Creating Style Sheets; Common Tasks with CSS: Text, Fonts, Margins, Links, Tables, Colors; Marquee; Mouseovers; Filters and Transitions; Adding Links; Adding Tables; Adding Forms; Adding Image and Sound;

**UNIT – IV**
Extensible Mark-up Language(XML): Introduction; Features; XML Support and Usage; Structure of XML Documents; Structures in XML;Creating Document Type Declarations; Flow Objects; Working with Text andFont; Color and Background properties;

**TEXT BOOKS:**
1. Internet and Web Technologies, Raj Kamal, Tata McGraw-Hill.  
3. Internet and Web Design, ITLESL Research and Development Wing, Macmillan India.

**REFERENCE BOOKS:**
2. Internet and World Wide Web, How to Program, Deitel and Goldberg, PHI.
Note: Examiner will be required to set nine questions in all. First question will be compulsory, consisting of at least seven objective type/short answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions carry equal marks.

Unit-I
INTRODUCTION TO JAVA & PRINCIPLES OF OBJECT ORIENTED PROGRAMMING: Basic concepts of OOP and its Benefits; Application of OOP; The Creation of Java; Importance of Java for the Internet; Java’s Magic: The Byte-code; Features of Java.

DATA TYPE, ARRAY & STRINGS: Data types & Operators available in java; Control Structures: if, while, do while, for, switch; Break & Continue Statement; Arrays and Strings: Arrays, Arrays of Characters; String handling Using String Class; Operations on String Handling Using: String Buffer Class.

Unit-II


Unit-III
MULTITHREADING PROGRAMMING: The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread extending Thread and implementing Runnable, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks inter-thread communication, Deadlocks.

Input/Output in Java: I/O Basic, Byte and Character Structure, I/O Classes, Reading Console Input, Writing to Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File. Stream Benefits.

Unit-IV
CREATING APPLETS IN JAVA: Applet basics, applets architecture; applet life cycle; simple applet display methods; requesting repainting; using the status window; the html applet tag; passing parameters to applets.

JAVA DATA BASE CONNECTIVITY (JDBC): Database Connectivity- Relation Databases; JDBC API; Reusing Database Objects; Transactions; Advance Techniques. Java Utilities (java.util Package) The Collection Framework : Collections of Objects; Collection Types; Sets Sequence Map; Understanding Hashing; Use of Array List & Vector.
TEXT BOOK

REFERENCE BOOKS
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Introduction to Linux: Linux distributions, Overview of Linux operating system, Linux architecture, Features of Linux, Accessing Linux system, Starting and shutting down system, Logging in and Logging out. Comparison of Linux with other operating systems.

UNIT – II
Commands in Linux: General-Purpose commands, File oriented commands, directory oriented commands, Communication-oriented commands, process oriented commands, etc.
Regular expressions & Filters in Linux: Simple filters viz. more, wc, diff, sort, uniq, grep.
Introducing regular expressions.

UNIT – III
Linux file system: Linux files, inodes and structure and file system, file system components, standard file system, file system types.
Processes in Linux: starting and stopping processes, initialization Processes, mechanism of process creation, Job control in linux using at, batch, cron & time.

UNIT – IV
Shell Programming: VI editor, shell variables, I/O in shell, control structures, loops, subprograms, creating & executing shell scripts in linux.

TEXT BOOKS:
1. Yashwant Kanetkar, UNIX & Shell programming – BPB.
2. M.G.Venkateshmurthy, Introduction to UNIX & Shell Programming, Pearson Education.

REFERENCE BOOKS:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I
Internet and TCP/IP: Introduction to the Internet; Internet History, Internet Administration; Internet and Intranet; Internet Services; TCP/IP model and its protocols; IP addresses: IPv4; Subnetting IPv4 addresses; SuperNetting; Next generation Internet Protocol (IPv6); The need for IPv6; Packet Format; IPv6 Addresses; Extension Headers;

UNIT – II
TCP/IPs Transport and Network Layer Protocols: Role of TCP, UDP, IP, and Port numbers; Format of TCP, UDP and IP; TCP services; TCP connection management; Remote Procedure Call; SCTP; IP address resolution- DNS; Domain Name Space; DNS mapping; Recursive and Iterative resolution; Resource records; Mapping Internet Addresses to Physical Addresses; ARP, RARP, BOOTP, DHCP; ICMP; IGMP;

UNIT – III
TCP/IP Application Level Protocols: Electronic Mail : Architecture; SMTP, MIME, POP, IMAP; Web Based Mail; File Access and Transfer: FTP, Anonymous FTP, TFTP, NFS; Remote Login using TELNET; Voice and Video over IP: RTP, RTCP, IP Telephony and Signaling, Resource Reservation and Quality of Service, RSVP;

UNIT – IV
Routing in Internet: RIP, OSPF, BGP; Internet Multicasting; Mobile IP; Private Network Interconnection: Network Address Translation (NAT), Virtual Private Network (VPN); Internet Management: SNMP; Internet Security: IPSec, E-Mail Security; Web Security; Firewalls; Digital Signatures; Certificates;

TEXT BOOKS

REFERENCE BOOKS:
4. “Introduction to Data Communications and Networking”, Wayne Tomasi, Pearson Education.
BCA – 364 VISUAL BASIC
Maximum Marks: 100
External: 70
Internal: 30
Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

UNIT – II

UNIT – III

UNIT – IV
Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types, Functions returning arrays. Working with forms: Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, Activate & deactivate events, Form-load event, menu designing in VB. Simple programs in VB.

TEXT BOOKS:

REFERENCE BOOKS:
BCA – 365 MULTIMEDIA TECHNOLOGY

Maximum Marks: 100

External: 70

Internal: 30

Time: 3 hours

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

Introduction to Multimedia: Components of Multimedia; Hypermedia and Multimedia; Overview of Multimedia Software Tools; Multimedia Hardware and Software; Basic Software Tools; Making Instant Multimedia; Presentation Tools; Multimedia Authoring; Types of Authoring Tools; Cardand Page-Based Authoring Tools; Icon-Based Authoring Tools; Time-Based Authoring Tools; Object-Oriented Authoring Tools; VRML;

UNIT – II

Graphics and Image Data Representation: Graphics/Image Data Types, Popular File Formats; Color Models in Images and Video; Types of Video Signals; Analog and Digital Video: Broadcast Video Standards: NTSC, PAL, SECAM, HDTV; Chroma Subsampling; CCIR Standards for Digital Video;

UNIT – III

Digital Audio: Digitization of Sound; MIDI Versus Digital Audio; Quantization and Transmission of Audio: Coding of Audio; Pulse Code Modulation; Differential Coding of Audio; Lossless Predictive Coding; DPCM; DM; ADPCM;

UNIT – IV

Multimedia Data Compression: Run-Length Coding; Variable-Length Coding; Dictionary-Based Coding; Transform Coding; Image Compression Standards – JPEG standard; Video Compression Techniques: H.261, H.263, MPEG;

TEXT BOOKS:

REFERENCE BOOKS:
Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

UNIT – I

UNIT – II
Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing.

UNIT – III
Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity.
Control constructs in C#: Decision making, loops.
Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

UNIT – IV
Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces.
Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams).

TEXT BOOKS:
1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill

REFERENCES BOOKS:
1. The Complete Guide to C# Programming by V. P. Jain