B.A./B.Sc.(Semester System) (12+3 System of Education)

SEMESTER–I
COMPUTER SCIENCE
COMPUTER FUNDAMENTAL & PC SOFTWARE

Time: 3 Hours   **Total Marks: 100**
4Hours/week   **Theory Marks: 56**
                                          Theory Internal Assessment M: 19
                                                       Practical Marks: 18
                                   Practical Internal Assessment M: 07

Note: The question paper covering the entire course shall be divided into three sections.

Section A: It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length.The total weightage being **12 marks**.

Section B: It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.
The total weightage of this section shall be **22 marks.**

Section C: It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.
The total weightage of this section shall be **22 marks**

UNIT–I
Introduction to computer and its uses: milestones in hardware and software, batch oriented/online/real time application.
Computer as a system: basic concepts, stored programs, functional units and their inter – relation, communication with the computer.
Data storage devices and media: primary storage: storage addressed, and capacity, type of memory: secondary storage; magnetic tape – data representation and R/W: magnetic disc, fixed & removable, data representation and R/W, floppy disc drives, Winchester disc drive, conventional disc drives, Data organization, Compact Disc.
Input/output devices: Key–tape/diskette devices, light pen mouse and joystick, source data automation (MICR, OMR, and OCR), screen assisted data entry; portable/hand held terminals for data collection, vision input system.
Printed output: Serial, line, page, printers; plotters, visual output; voice response units.

UNIT-II

Introduction to Windows based operating system and Desktop icons

MS–Office 2010:
Introduction to Word, Introduction to Parts of Word Window (Title Bar, Menu Bar, Tool Bar, The Ruler, Status Area), Page Setup, Creating New Documents, Saving Documents, Opening an Existing documents, insert a second document into an open document, Editing and

formatting in document, Headers and Footers, Spell Checking, Printing document, Creating a Table Using the Table Menu and table formatting, Borders and Shading, Templates and Wizards, Mail Merge.

MS Power Point 2010:

Introduction to MS Power point, Power point elements, Templates, Wizards, Views, Exploring Power Point Menu, Working with Dialog Boxes, Adding Text, Adding Title, Moving Text Area, Resizing Text Boxes, Adding Art, Starting a New Slide, Starting Slide Show, Saving presentation; Printing Slides, Views (View slide sorter view, notes view, outlines view)
Formatting and enhancing text formatting, Creating Graphs (Displaying slide show and adding multi–media)

References:

1. R.K. Taxali: Introduction to Software Packages, Galgotia Publications.
2. MS-Office compiled by SYBIX
3. MS-Office BPB Publications.
4. Introduction to Computer by P.K. Sinha
5. Windows Based Computer Courses by Gurvinder Singh & Rachpal Singh.

B.A./B.Sc.(Semester System) (12+3 System of Education)

(PRACTICAL)

Time: 3 hours
2Hours/week

Practical based on Computer Fundamental & PC Software

Windows 7, MS Word 2010, Power Point 2010.

B.A. /B.Sc. (Semester System) (12+3 System of Education)

SEMESTER–II

PROGRAMMING USING C
(Theory)

Time: 3 Hours
4Hours/week

Total Marks: 100
Theory Marks: 56
Theory Internal Assessment M: 19
Practical Marks: 18
Practical Internal Assessment M: 07

Section A: It will have question No.1 consisting of 10 very short answer questions from the entire syllabus. Students will attempt 6 questions. Each question will carry two marks with answer to each question up to 10 lines in length. The total weightage being **12 marks**.

Section B: It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 2, 3, 4 and 5 will be set by the examiner from Unit-I of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.
The total weightage of this section shall be **22 marks.**

Section C: It will consist of essay type/numerical questions up to five pages in length. Four questions numbering 6, 7, 8 and 9 will be set by the examiner from Unit-II of the syllabus. The students will be required to attempt any two questions. Each question will carry 11 marks.
The total weightage of this section shall be **22 marks**

UNIT–I
Data Representation, Introduction to Number Systems and Character Codes, Flow Charts, Problem Analysis, decision tables, pseudo codes and algorithms.

Programming Language C

Basics of C: Introduction to C, Applications and Advantages of C, Tokens, Types of Errors
Data Types: Basic & Derived Data Types, User Defined Data Types, Declaring and initializing variables.
Operators and Expressions: Types of operators (Unary, Binary, Ternary), Precedence and Associativity
Data I/O Functions: Types of I/O function, Formatted & Unformatted console I/O Functions
Control Statements: Jumping, Branching and Looping–Entry controlled and exit controlled,
Advantages/Disadvantages of loops, difference between for, while and do–while.

UNIT–II

Arrays: Types of Arrays, One Dimensional and Two Dimensional Arrays.

Strings: Introduction to Strings and String functions, array of strings.
Functions: User Defined & Library Function, Function (Prototype, Declaration, Definition), Methods of passing arguments, local and global functions, Recursion.
Storage Classes: Introduction to various storage classes, scope and lifetime of a variable, Storage class specifiers (auto, register, static, extern), advantages and disadvantages.
Structure and Union: Introduction to structure and union, pointers with structure

Books Suggested:
(i) Programming with C Languages C. Schaum Series.
(ii) Yashwant Kanetkar – Let Us C
(iii) C Programming by Stephen G Kochan

B.A. /B.Sc. (Semester System) (12+3 System of Education)

(PRACTICAL)

Time: 3 Hours
2Hours/week

Practical based on Programming in C

B.A. /B.Sc. (Semester System) (12+3 System of Education)

SEMESTER–III
COMPUTER SCIENCE
Computer Oriented Numerical and Statistical Methods
(Theory)

Time: 3 Hours

4Hours/week

Total Marks: 100
Theory Marks: 60
Theory Internal Assessment M: 15
Practical Marks: 20
Practical Internal Assessment M: 05

Instructions for the Paper Setters:
(i) Eight questions are required to be set giving the equal weightage to all the units. The candidates will be required to attempt any five questions. All questions will carry equal marks.

(ii) Practical marks will include the appropriate weightage for proper maintenance of Lab record.

(iii) The students can use only Non Programmable & Non Storage Type Calculator.

UNIT-I
Introduction

1 Numerical methods, Numerical methods versus numerical analysis, Errors and Measures of errors.

2 Non-linear Equations, Iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bisection, False position Method, Newton Raphson-method.

3 Simultaneous Solution of Equations, Gauss Elimination Method, Gauss Jordan method. Gauss Siedel Method, Matrix Inversion Method.

UNIT II

4 Interpolation and Curve Fitting, Lagrangian Polynomials, Newton Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

5 Numerical Integration and Different Trapezoidal Rule, Simpson's 1/3 Rule Simpson's 3/8 Rule.

Numerical differentiation by Polynomial Fit Statistical Techniques

1 Measure of Central Tendency, Preparing frequency distribution table, Mean Arithmetic, Mean geometric, Mean harmonic, Mean median Mode.

2 Measure of dispersion, Skewness and Kurtosis Range, Mean deviation, Standard deviation, Co-efficient of variation, Moments Skewness Kurtosis.

UNIT III

1. Correlation Bivariate Distribution Multivariate distribution.

2. Regression B.C., Linear Regression, Multiple Regression .

3. Trend Analysis least square fit linear trend, Non-linear trend

$Y=ax^b$

$Y=ab^x$

$Y=ae^{bx}$

Polynomial fit: $Y= a+bx+cx^2$

Books Recommended:

1 B.S. Grewal: *Numerical Methods for Engineering,* Sultan Chand Publications.

2 V. Rajaraman: *Computer Oriented Numerical Methods,* Prentice Hall of India Private Ltd.,.

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SEMESTER–III
COMPUTER SCIENCE
Computer Oriented Numerical and Statistical Methods Lab.

Practical based on Computer Oriented Numerical and Statistical Methods.

B.A. /B.Sc. (Semester System) (12+3 System of Education)

SEMESTER–IV
COMPUTER SCIENCE
Data Structures & Programming Language Using C++
(Theory)

Time: 3 Hours	**Total Marks: 100**
4 Hours/week	**Theory Marks: 60**
	Theory Internal Assessment Marks: 15
	Practical Marks: 20
	Practical Internal Assessment Marks: 05

Instructions for the Paper Setters:
(i) Eight questions are required to be set giving the equal weightage to all the units. The candidates will be required to attempt any five questions. All questions will carry equal marks.
(ii) Practical marks will include the appropriate weightage for proper maintenance of Lab record.
(iii) The students can use only Non Programmable & Non Storage Type Calculator.

UNIT I
Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time-Space Trade-off between Algorithm.
Arrays: Array Defined, Representing Arrays in memory, Various operations on Linear arrays, Multi-Dimensional arrays.
Linked Lists: Types of Linked Lists, representing linked list in memory, advantages of using linked lists over arrays, Various operations of linked lists.
UNIT II
Stacks: Description of STACK structure, Implementation of stack, using arrays and linked lists, application of stack-converting Arithmetic expression from infix notational to polish and their subsequent evaluation, quicksort technique to sort an array.
Queues: Description of queue structure, Implementation of queue using arrays and linked lists, description or priorities of queues, deques.
Sorting and Searching: Sorting Algorithms, bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort, searching Algorithms, linear search and binary search.
UNIT III
Object Oriented Programming: objects & classes, constructor & destructor, operator overloading, overloading unary operators, overloading binary operators, data conversion, Pitfalls of operator overloading and conversion, Inheritance, Derived class and base, Derived class constructor. Overloading member functions, Inheritance in the English distance class, class hierarchies, Public & Private inheritance, Level of inheritance, Polymorphism, problems with single inheritance, multiple inheritance.

References:
1. Seymour Lischutz, *Theory and Problems of Data Structures.*
2. *Schaum's Outline Serie*s, McGraw Hill Company.
3. Tanenbaum, *Data Structure*

B.A./B.Sc.(Semester System) (12+3 System of Education)

SEMESTER–IV
COMPUTER SCIENCE
Data Structures & Programming Language Using C++ Lab

2 Hours/week

Practical based on Data Structures & Programming Language Using C++

B.A./B.Sc.(Semester System) (12+3 System of Education)

Semester V

Computer Science

Data Base Management System & Oracle

4Hours/week

Total Marks: 100
Theory Marks: 60
Theory Internal Assessment M: 15
Practical Marks: 20
Practical Internal Assessment M: 05

Note
(i) In theory eight questions are to be set giving the weightage to all the portions. The candidates are required to attempt any five. All questions are to be of equal marks.
(ii) The maximum marks for the paper will be 75 including internal assessment.
(iii) As for as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.
(iv)The students can use only Non Programmable and Non storage type calculator in the subjects/papers pertaining to computer.

UNIT-I

DBMS
Introduction to database management system, components of DBMS, ER. Diagrams, Data Description Language, Data Manipulation Language, SQL.

Data Models: Hierarchical Model, Network Model and Relational Model, Relational Databases. Relational Algebra and Calculus Normalisation.

Database Security, Protection, Integrity, Recovery, Concurrency, Control, Decomposition. Distributed Databases, Knowledge Base/Expert Systems and Object Oriented Databases.

UNIT-II

Oracle 10g
SQL * PLUS
Introduction to Oracle 10
SQL - DDL, DML, DCL.
Join methods & Sub query, Union, Intersection.
Built in Functions, View Security amongst users, Sequences, indexing object features of Oracle 10.
PL/SQL
Introduction to PL/SQL.
Cursors - Implicit & Explicit.
Procedures, Functions & Packages.
Database Triggers.
References:
1 Desai B.C.: An Introduction to Database Systems, Galgotia Publishers.
2 Date C.J. An Introduction to Database Systems, Vol. I, Narosa Publishers.

B.A. /B.Sc.(Semester System) (12+3 System of Education)

SEMESTER–V
COMPUTER SCIENCE
Database Management System and Oracle
(Practical)

2 Hours/week

Practical based on Database System and Oracle

B.A. /B.Sc. (Semester System) (12+3 System of Education)

B.A. /B.Sc. Semester VI
Computer Science
Information Technology

Time: 3 Hours
4 Hours per week

Total Marks: 100
Theory Marks: 60
Theory Internal Assessment Marks: 15
Practical Marks: 20
Practical Internal Assessment Marks: 05

(i) In theory eight questions are to be set giving the weightage to all the portions. The candidates are required to attempt any five. All questions are to be of equal marks.
(ii) The maximum marks for the paper will be 75 including internal assessment.
(iii) As far as possible except in the Computer language papers no programme may be asked in theory papers. Emphasis should be on algorithm development.
(iv) The students can use only Non Programmable and Non storage type calculator in the subjects/papers pertaining to computer.
Practical marks will include the appropriate weightage for proper maintenance of Lab record.

UNIT-I

Data & Network Communication
Communication media: Twisted pair, Coaxial, Fibre optics, Wireless(Line of Sight & Satellite), Network Advantages, Types & Topologies, Communication using Network protocol/Network Interface card(NP/NIC), Transmission & Communication protocol/protocol(TCP/IP), Modems, Types of Operating systems: Multiuser, Multitasking & Multiprogramming and their examples.

UNIT-II

Information Systems
Introduction to IT & its components, What is Information systems, Computer based information systems, Management Information System, Decision Support System, Expert System, Functional Information System, Open Information System, Transaction Processing System, System Development Process & System development Tools. Internet basics, Its uses and Applications.
Fundamentals of Networking Operating System.
Introduction to components of various Networking Operating System, Case Study of Network Operating System Linux.

UNIT-III

Fundamental of Client Server
Basics of Client Server model and its applications. Designing a Client Server model by Creating Database Server and networking O.S. Server.
Careers in Computers
Role of Programmers, Program analysis, System Analyst, System Administrators, System Managers, System Integrators, DTP Manager & Administrators, MIS Director.

References:
1 Peter Norton, Introduction to Computers, Glencoe, Macmillan/McGraw Hill. Kroenke, Business Computer System, McGraw Hill.
2 Patric, G.Mckeown, Living with the Computers, 2nd edition, HBT Publishers, USA.
3 Hussain & Hussain, Computer Technology, Applications & Social Implications, PHI.

B.A. /B.Sc. (Semester System) (12+3 System of Education)

SEMESTER–VI
COMPUTER SCIENCE
Information Technology (Practical)

2 Hours/week

Practical based on Network Operating System

B.A./B.Sc.(Semester System) (12+3 System of Education)