

FIRST SEMESTER

S.No	Paper Code	Subject	Hours/ Week	No of Credits	Max. Marks	Max. Marks University Exam	Total Marks
					Internal assessment		
1		English – I	4	3	25	75	100
2		Language(H/T/S/U) – I	4	3	25	75	100
3		Life Skill Course – I	2	2	0	50	50
4		Skill Development Course – I	2	2	0	50	50
5	C1	Computer Fundamentals & Office tools	4	4	25	75	100
6	C1-P	Computer Fundamentals & Office tools-Lab	2	1	0	50	50
7	C2	Programming in C	4	4	25	75	100
8	C2-P	Programming in C Lab	2	1	0	50	50
9	C3	Numerical and Statistical Methods	4	4	25	75	100
10	C3-P	Numerical and Statistical Methods- Lab	2	1	0	50	50
Total			30	25	125	625	750

Second Semester

S.No	Paper Code	Subject	Hours/Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1		English – II	4	3	25	75	100
2		Language(H/T/S/U) – II	4	3	25	75	100
3		Life Skill Course – II	2	2	0	50	50
4		Skill Development Course – II	2	2	0	50	50
5		Skill Development Course – III	2	2	0	50	50
6	C4	Data Structures	4	4	25	75	100
7	C4-P	Data Structures Lab	2	1	0	50	50
8	C5	Object Oriented Analysis & Design	4	4	25	75	100
9	C5-P	Object Oriented Analysis & Design Lab	2	1	0	50	50
10	C6	Database Management Systems	4	4	25	75	100
11	C6-P	Database Management Systems Lab	2	1	0	50	50
Total			32	27	125	675	800

Third Semester

S.No	Paper Code	Subject	Hours/Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1		English –III	4	3	25	75	100
2		Language(H/T/S/U) – III	4	3	25	75	100
3		Life Skill Course – III	2	2	0	50	50
4		Life Skill Course – IV	2	2	0	50	50
5		Skill Development Course – IV	2	2	0	50	50
6	C7	Accounting and Financial Management	4	4	25	75	100
7	C7-P	Accounting and Financial Management Lab	2	1	0	50	50
8	C8	Object Oriented Programming Through Java	4	4	25	75	100
9	C8-P	Object Oriented Programming Through Java Lab	2	1	0	50	50
10	C9	Operating Systems	4	4	25	75	100
11	C9-P	Operating Systems Lab	2	1	0	50	50
Total			32	27	125	675	800

Fourth Semester

S.No	Paper Code	Subject	Hours/Week	No of Credits	Max. Marks Internal assessment	Max. Marks University Exam	Total Marks
1	C10	Cyber Laws	4	4	25	75	100
2	C10-P	Cyber Laws Lab	2	1	0	50	50
3	C11	Data Mining and Data Warehousing	4	4	25	75	100
4	C11-P	Data Mining and Data Warehousing Lab	2	1	0	50	50
5	C12	Web Programming	4	4	25	75	100
6	C12-P	Web Programming Lab	2	1	0	50	50
7	C13	Design of Object Oriented Applications	4	4	25	75	100
8	C13-P	Design of Object Oriented Applications Lab	2	1	0	50	50
9	C14	Data Analytics using R	4	4	25	75	100
10	C14-P	Data Analytics using R Lab	2	1	0	50	50
11	C15	Object Oriented Software Engineering	4	4	25	75	100
12	C15-P	Object Oriented Software Engineering Lab	2	1	0	50	50
Total			36	30	150	750	900

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA I Year I Semester
Computer Fundamentals and MS - Office

UNIT – I

Introduction to computers: Definition of computer, Characteristics and limitations of computer, Block diagram of computer, types of computers, uses of computers, computer generations, Input devices and output devices: Keyboard and mouse, inputting data in other ways

UNIT – II

Memories: primary, secondary and cache memory, **Types of Software:** system software, Application software, commercial software, open source software, domain software and free ware software, Operating Systems fundamentals, MS – DOS, **Programming Languages:** Introduction to Programming Languages – Generations of Programming Languages

UNIT –III

MS-Word: Features of MS-Word, MS-Word Window components, creating, saving and opening documents, **Formatting documents:** Selecting text, Formatting characters, changing cases, Paragraph formatting, Bullets & numbering, **Editing text:** Copying & moving data, Finding & replacing text, Reversing actions(undo). Header & footer, **Working with Tables:** Definition, inserting tables, inserting & deleting rows and columns. **Working with Graphics:** Inserting pictures, inserting shapes, inserting clipart images. Mail merging, Printing documents.

UNIT - IV

MS-Excel: Excel Features, MS-Excel window components, Worksheets, rows, columns, cells. **Worksheet basics:** Workbooks, Creating a new workbook, Opening a Workbook, Saving a Workbook, Entering labels, values, and formulas in worksheet, Inserting rows and columns, Deleting rows and columns, **Formatting Options:** Adjusting row height and column width - Formatting cell values, **Formulas:** operators used in formula, cell references in formula, **Functions:** Definition, Inserting a function in Excel, Types of functions in Excel: Mathematical, Statistical, Logical, Text, **Working with Charts:** Different types of charts, Creating a chart, Parts of chart

UNIT - V

Microsoft PowerPoint: PowerPoint features, MS-PowerPoint window components, creating a presentation, saving presentation and opening presentation, **working with slides:** Inserting, deleting, copying slides, editing text, formatting text, **Formatting and Modifying Presentations:** Applying transition and animation to the slides, inserting music or sound on a slide, viewing slide show

Text Books:

1. Computer Fundamentals – Pradeep .K.Sinha: BPB Publications.
2. Fundamentals of Computers by Reema Thareja from Oxford University Press
3. Microsoft Office 2007 Fundamentals, 1st Edition By Laura Story, Dawna Walls

References:

1. Rajaraman, Introduction to Information Technology, PHI
2. Introduction to Computers – Peter Norton Mcgraw Hill.
3. Microsoft Excel 2007, Custom Guide Inc, 2007

Model Question Paper (Sem – end. Exam)
BCA I Semester - Computer Fundamentals & MS - Office

Time : 3 Hours.

Max. Marks: 75M.

SECTION-A

Answer any FIVE Questions.

5 X 5 = 25M

1. Characteristics of Computer.
2. Uses of Computers.
3. Write about secondary memory.
4. Define Operating Systems and its types.
5. Explain the use of Bullets and Numbering.
6. Write about formatting a document.
7. How to Insert & Delete Rows and Columns.
8. Write about Statistical functions.
9. How to edit and formatting text in a slide.
10. Explain how to View a Slide show.

SECTION – B

Answer any FIVE questions.

5 X 10 =50M.

1. Explain about different types of Computers.
2. Explain about Input Devices.
3. Explain about Internal and External commands.
4. Explain about different types of Softwares
5. Explain about creating a Table in MS- Word.
6. Explain about Mail Merge.
7. Explain about different types charts in MS – Excel.
8. Explain how to format cells in Excel.
9. Explain how to create and save a presentation.
10. Explain how to format and modify a presentation.

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.

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Bachelor of Computer Applications Syllabus under CBCS
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BCA I Year I Semester
Computer Fundamentals and MS – Office LAB

MS-WORD

1. Prepare a document in to design a visiting card
2. Prepare a document to design front page of a text book
3. Prepare a document to illustrate headers and footers
4. Prepare a Call Letter for All Applicants to inform interview Details using mail merge

MS-EXCEL

5. Create an excel sheet to show time table of your class
6. Create a pay slip with details of employee salary
7. Create an excel sheet for student result and grades calculation
8. Prepare an excel sheet for creating a pie chart for budget analysis
9. Prepare an excel sheet to illustrate various functions

MS-POWERPOINT

10. Prepare a presentation about your college
11. Prepare a presentation about Olympic games
12. Prepare a presentation about your country / state / place

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Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA I Year I Semester
Programming in C

UNIT - I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – Compiling and Executing C Programs - Programming Examples

UNIT - II

C Fundamentals : Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Operators in C – I/O Statements (scanf, printf)

Decision Control Statements: Introduction to Decision Control Statements – Conditional Branching Statements : simple if, if..else, nested if, switch statements – Programming Examples.

UNIT - III

Iterative Control Statements: Iterative Statements – Nested Loops – Break and Continue Statement - Goto Statement

Arrays: Introduction – One dimensional Arrays- Declaration of Arrays – Accessing elements of the Array – Storing Values in Array –Operations of One dimensional Array - Two dimensional Arrays – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array- Operations of Two Dimensional Array..

Strings: Introduction – String functions – Character functions.

UNIT - IV

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure and Unions: Introduction – Nested Structures – Arrays of Structures – Structures and Functions – Unions – Arrays of Unions Variables

UNIT - V

Pointers: Introduction to Pointers – declaring Pointer Variables – Passing Arguments to Functions using Pointer – Pointer and Arrays – Dynamic Memory Allocation

File Handling: Introduction to Files, File modes, File operations, Reading Data from Files, Writing Data from Files, Detecting the End-of-file

Text Books:

1. Computer Fundamentals and Programming in C by Reema Thareja from Oxford University Press

Reference Books

1. E Balagurusamy: Computing Fundamentals & C Programming – Tata McGraw-Hill, Second Reprint 2008, ISBN 978-0-07-066909-3.
2. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
3. Yashavant Kanetkar - Let Us 'C' – BPB Publications.
4. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language - Pearson publications.

Model Question Paper (Sem – end. Exam)
BCA I Semester - Programming In C

Time : 3 Hours.

Max. Marks: 75M.

SECTION-A

Answer any FIVE Questions.

5 X 5 = 25M

1. Define Flowchart. Draw the flowchart for biggest of 2 numbers.
2. How to compile and Execute a C program.
3. Explain about Input and Output statements in C language.
4. Explain about conditional Operator with an example.
5. Write the syntax for switch statement.
6. Write about jump statements.
7. Write about Storage classes.
8. Define function. How to define a user defined function.
9. Write about Dynamic memory allocation.
10. Write about File modes.

SECTION – B

Answer any FIVE questions.

5 X 10 =50M.

11. Explain about Generations of Programming languages.
12. Explain about the structure of C program with example.
13. Explain about operators in C language.
14. Explain about Decision making statements.
15. Explain about for loop and Write a C program to print even series from 1 to n.
16. Write a C program for multiplication of two matrices.
17. Explain about different types of functions.
18. Explain about structures with an example.
19. Define Pointer and explain how to pass pointers as arguments to a function.
20. Explain about File operations.

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA 1 Year I Semester
Programming in C Lab

1. Write a C program to calculate the expression: $((a*b)/c)+(a+b-c)$.
2. Write a C program to calculate $(a+b+c)^3$.
3. Write a C program to check whether the given number is Prime or Not.
4. Write a C program to find the sum of individual digits of a given number .
5. Program to convert Hours into seconds.
6. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
7. Write a program to check whether given number is Palindrome or Not.
8. Write a C program to check whether a given 3-digit number is Armstrong number or not.
9. Write a C program to print the numbers in triangular form.
1
1 2
1 2 3
1 2 3 4
10. Program to display number of days in given month using Switch – Case.
11. Write a C program to perform the following:
 - i. Addition of two matrices.
 - ii. Multiplication of two matrices.
12. Write a C program to determine if the given string is a palindrome or not.
13. Write C program to find the factorial of a given integer using recursive function.
14. Write a C program to concatenate two strings using pointers.
15. Write a C program to find the length of string using pointers.
16. Program to display Student Details using Structures.
17. Write a C program to
 - i. Write data into a File.
 - ii. Read data from a File.

Andhra Pradesh State Council of Higher Education
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w.e.f 2020-2021 Academic Year

BCA I Year II Semester
Data Structures

UNIT – I

INTRODUCTION TO DATA STRUCTURE: Definition, Data Types, Abstract Data Types (ADT), classification of data structure - Linear and Non-linear data structures

ARRAYS: Definition, one dimensional array, two dimensional arrays, Applications, pointers.

LINKED LIST: Definition, linked list ADT, single linked list, double linked list, circular linked list, comparison of linked list with Arrays.

UNIT – II

STACKS: Definition, Stack as an ADT & Operations on stack, Applications of stack, Representation of stack.

QUEUES: Definition, Queue as an ADT & Operations on Queue, Application of Queues, Representation of Queues, Various Queue Structures: circular Queue, DEQueue.

UNIT – III

TREES: Definition, Basic Tree Terminology. **Binary Tree** – Definition, Properties of Binary Trees, Types of Binary Trees, Representation of Binary Tree, Binary Tree Traversals. **Binary Search Tree (BST)** – Definition, Operations on a Binary Search Tree, Examples of BST.

UNIT - IV

GRAPHS: Definition, Basic Graph Terminology, Representation of Graphs, Graph Traversal – DFS and BFS. Topological sort, Shortest Path problem, Minimum Spanning Tree.

UNIT – V

SORTING: Definition, Sorting methods - Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort.

SEARCHING: Definition, searching methods - Linear or Sequential Search, Binary Search.

Text Books:

1. “Classic Data Structures ”, by DEBASIS SAMANTHA 2nd EDITION, PHI publications , 2009
2. “Data Structures and Algorithms”, by NARASIMHA KARUMANCHI , CAREERMONK Publications , 2017

Reference Books:

1. Data structures by Lipschutz, McGraw Hill Education
2. Fundamentals of Data Structures in C by Sahni Horowitz, University Press
3. Data Structures And Algorithms by Alfred V Aho and John E Hopcroft and Jeffrey D Ullman, Pearson Education
4. “Data Structures through C”, Yashavant Kanetkar, BPB Publications

MODEL QUESTION PAPER (Sem-end. Exam)
BCA II SEM – DATA STRUCTURES USING C

Time: 3 hours

Max.Marks: 75

SECTION-A

Answer any FIVE questions.

5X5 = 25M

1. Explain about Abstract Data Types.
2. Define linear and non-linear data structures.
3. Explain Linked List concept.
4. What are the applications of stacks?
5. What is priority queue?
6. Explain about binary search tree.
7. Define sorting. What are the advantages and disadvantages of merge sort?
8. Briefly explain various representations of Graphics.
9. How to reverse a given linked list.
10. Write different applications of Binary and Binary search trees.

SECTION-B

Answer following question

5X10 = 50M

1. What are primitive and non-primitive data structures with an example?
2. Explain different primitive data types.
3. Explain different operations on single linked list.
4. What is linked list? Explain different types of linked lists in data structures.
5. What is stack? Explain various operations of stack.
6. Explain about Queue using linked list.
7. Explain about different tree travelling techniques.
8. Explain different applications and properties of binary tree.
9. Write about various Graph Travelling techniques.
10. What is searching? Explain Linear Search Algorithm with example.

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.

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Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA I Year II Semester
Data Structures Lab**

1. Program to generate Fibonacci series using recursion
2. Program for implementation of stack using arrays.
3. Program for implementation stack using linked list.
4. Program for implementation queue using array.
5. Program for implementation queue using linked list.
6. Program for implementation of circular queue.
7. Program for linear searching.
8. Program for binary searching.
9. Program for Binary search tree operations.
10. Program to implement Graph traversal using DFS
11. Program to implement Graph traversal using BFS
12. Program for bubble sort
13. Program for selection sort
14. Program for insertion quick sort
15. Program for merge sort

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA 1 Year II Semester
Object Oriented Analysis and Design**

UNIT - I:

The Object Model-The Evolution of the Object Model: The generations of programming languages. **Foundations of the Object Model:** Object Oriented Analysis, Object Oriented design, Object Oriented Programming. **Elements of the Object Model:** Programming Paradigm(programming style), The Major and Minor Elements of the Object Models, Abstraction, Encapsulation, Modularity, Hierarchy(single inheritance, multiple inheritance, Aggregation), Static and Dynamic Typing, Concurrency, Persistence.

UNIT - II:

Classes and Objects-The Nature of an Object: What is and what is not an Object, State, Behavior, and Identity. **Relationships among Objects:** Links, Aggregation. The Nature of a Class: Interface and Implementation, Class Lifecycle. **Relationships among Classes:** Association: Semantic Dependencies, Multiplicity, Inheritance, Polymorphism, Aggregation, Dependencies.

UNIT - III:

Classification-The Importance of Proper Classification: The Difficulty of Classification, The Incremental and Iterative Nature of Classification. **Identifying classes and Objects:** Classical and Modern Approaches.

Object Oriented Analysis: Classical Approaches, Behavior Analysis, Domain Analysis, Use Case Analysis.

UNIT - IV:

The Unified Modeling Language: Diagram Taxonomy: Structure Diagrams, Behavior Diagrams. **The Use of Diagrams in Practice:** Conceptual, Logical and Physical Models **The Syntax and Semantics of the UML:** The Package Diagrams, Component Diagrams, Deployment Diagrams, Use Case Diagrams.

UNIT - V:

The Syntax and Semantics of the UML: Activity Diagrams, Class Diagrams, Sequence Diagrams, Interaction Diagrams, State Machine Diagrams, Object Diagrams

Text Book:

1. Object-Oriented Analysis and Design with Applications, 3rd Edition, By: Robert A. Maksimchuk, Bobbi J. Young, Grady Booch, Jim Conallen, Michael W. Engel, Kelli A. Houston, Pearson education.

Reference Books:

1. James Rumbaugh, Jacobson and Booch, Unified Modeling Language reference manual, PHI.
2. Ali Bahrami, Object oriented system development-using the unified modeling language, Tata McGraw Hill international edition, computer science series.

Model Question Paper (Sem – end. Exam)
BCA I Semester - Object Oriented Analysis and Design

Time : 3 Hours.

Max. Marks: 75M.

SECTION-A

Answer any FIVE Questions.

5 X 5 = 25M

1. Write about OOA and OOD?
2. Write about inheritance and its types.
3. Write about class.
4. Write about aggregation with diagram.
5. Write about usecase and its representation.
6. What association and explain its types?
7. What are the UML diagrams?
8. Difference between the logical and physical model?.
9. What is state and event?.
10. What is component diagram?.

SECTION – B

Answer any FIVE questions.

5 X 10 =50M.

11. Explain about Generations of Programming languages.
12. Explain about the elements of the object model.
13. Explain about relationship between classes and objects.
14. Write about lifecycle of a class and its interfaces and implementation.
15. What are the classical and modern approaches?
16. What are the incremental and iterative classifications?
17. What are the structural and Behavioral diagrams?
18. What is UML? what are the physical models.
19. What is Activity diagram? Explain with neat diagram.
20. Write about state machine diagram.

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
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**BCA 1 Year II Semester
Object oriented analysis and design lab**

1. Demonstrate Package Diagram for Hydroponics Gardening system.
2. Demonstrate Component Diagram for the Environmental control system.
3. Demonstrate Deployment Diagram for Environmental control system.
4. Develop Use Case Diagram for Hydroponics Gardening system.
5. Demonstrate Activity Diagram for Hydroponics Gardening system.
6. Demonstrate Class Diagram for the Environmental control system.
7. Demonstrate sequence diagram Environmental controller system.
8. Demonstrate sequence diagram for returning and removing books for library system
9. Demonstrate use case for returning book with fine for library system.
10. Draw the State Machine Diagram for the Duration Timer.
11. Draw the Interaction Diagram for Library system.
12. Demonstrate Object Diagram for the library system.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA 1 Year II Semester
Data Base Management System

UNIT - I

Introduction to Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, Classification of Database Management Systems, advantages and disadvantages of database approach, Components of Database Management System

UNIT - II

The Relational Database Model: Various Data Models, Relational Database model, Keys used in Relational model, Relational Data Integrity, Relational set operators, Relationships within the Relational Database, Codd's relational database rules.

Entity–Relationship Model: Introduction, The components of an ER model, entities, attributes, relationships, Classification of Entity Sets, Attribute Classification, Relationship Degree, Relationship Classification.

UNIT - III

Introduction to SQL: Structured Query Language (SQL) – Introduction - SQL data types - SQL literals , **SQL operators:** Arithmetic Operators - Comparison Operators - Logical Operators - Set Operators - Operator Precedence.

Types of SQL commands: DDL, DML, TCL, DCL

Tables: Creating tables – Altering tables – dropping tables – displaying structure of table. **Inserting, updating, and deleting:** INSERT statement – Bulk inserts of data – UPDATE statement – DELETE statement

UNIT - IV

Queries and Subqueries : using SELECT statement

Aggregate Functions – Introduction – COUNT(), COUNT(*), SUM(), AVG(), MAX() and MIN() functions. **Multiple table processing:** Joins and Unions

TCL commands: COMMIT, ROLLBACK, and SAVEPOINT statements

DCL commands: Privileges and roles – Granting and Revoking privileges and roles – GRANT and REVOKE statements.

UNIT - V

PL/SQL: Introduction, Structure of PL/SQL program, PL/SQL Data Types, operators used in PL/SQL, variables, declaring variables in PL/SQL, Creating and running a PL/SQL Program, **Control Structures:** Conditional control statements, Iterative Control statements, **Cursors:** Types of cursors, Steps to create a Cursor, using cursors in PL/SQL program

Text Books:

1. Database management Systems, Alexis Leon and Mathews Leon, Vikas Publications 2002
2. Peter Rob, Carlos Coronel, Database Systems Design, Implementation and Management, Seventh Edition, Thomson (2007)
3. SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB publications

References Books:

1. Elimasri / Navathe, Fundamentals of Database Systems, Fifth Edition, Pearson Addison Wesley (2007).
2. Database Principles, Programming, and Performance, P.O'Neil, E.O'Neil, 2nd ed., ELSEVIER.
3. SQL: The Ultimate Beginners Guide by Steve Tale.
4. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
5. Database Management Systems by Raghu Ramakrishnan, McGrawhill

Model Question Paper (Sem – end. Exam)
BCA II Semester - Database Management Systems

Time : 3 Hours.

Max. Marks: 75M.

SECTION-A

Answer any FIVE Questions.

5 X 5 = 25M

1. Write about components of DBMS.
2. Differences between file based system and data base system.
3. Explain different types of entities.
4. Write about codd's rules.
5. Write about Insert statement.
6. Write about SQL Operators.
7. Write about SQL Data types.
8. Write about Grant and Revoke statements.
9. Types of Cursors.
10. Data types in PL/SQL.

SECTION – B

Answer any FIVE questions.

5 X 10 =50M.

11. Explain about classification of DBMS.
12. Explain about advantages and disadvantages of database approach.
13. Explain about data models.
14. Explain about the components of ER model with neat diagram.
15. Explain about SQL operators.
16. Explain about Ddl, DML Commands.
17. Explain about Aggregate functions with examples.
18. Explain about joins.
19. Explain about iterative statements in PL/SQL.
20. Explain about the structure of PL/SQL program.

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
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BCA I Year II Semester
Data Base Management System Lab

1. Illustrate the creation of a table with constraints
2. Creation of college database and establish relationships between tables
3. Employee database

An enterprise wishes to maintain a database to automate its operations. Enterprise divided into certain departments and each department consists of employees. The following two tables describes the automation schemas

Dept (deptno, dname, loc)

Emp (empno, ename, job, mgr, hiredate, sal, comm, deptno)

Generate the following queries using data of above tables.

- i. List out all employees details
 - ii. Display empno, ename, job and sal columns of all employees
 - iii. Display employee details who are working as 'CLERK'
 - iv. Find out number of employees working in each department
 - v. Find out job wise total salaries and number of employees.
 - vi. Calculate HRA as 30% and DA as 65% of salary
4. Demonstrate the use of GRANT and REVOKE commands to provide authorization
- PL/SQL PROGRAMS**
5. Write a PL/SQL program to check the given number is armstrong or not.
 6. Write a PL/SQL program to check the given string is palindrome or not.
 7. Writ a PL/SQL program to generate multiplication tables
 8. Write a PL/SQL code to find the factorial of any number.
 9. Write a PL/SQL program to check the given number is palindrome or not.
 10. Write a PL/SQL program to display to 10 rows in Emp table based on their job and salary.
 11. Write a PL/SQL program to raise the employee salary by 10% for department number 30 people
 12. Write a procedure to update the salary of Employee, who are not getting commission by 10%.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
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BCA II Year III Semester
Object Oriented Programming through Java

UNIT - I

Fundamentals of OOP : Introduction, Object Oriented paradigm, Basic Concepts of OOP
Overview of Java Language: Introduction, Java features, Java program structure, Java tokens, Implementing a Java Program, Java Virtual Machine (JVM), Command line arguments. **Constants, Variables & Data Types:** Introduction, Constants, Data Types, Variables, Declaration of Variables, Giving Value to Variables, Scope of variables, Type casting, operators

UNIT - II

Input and Output in Java: Reading Input with Java.util.Scanner Class, Displaying Output with System.out.println(), **Control Statements in Java:** Conditional control statements, Iterative control statements, break Statement, continue Statement, return Statement

Classes, Objects & Methods: Introduction, Defining a class, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members

UNIT - III

Arrays, Strings: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Wrapper classes

Inheritance: Introduction, Types of inheritance, Overriding methods, Final variables and methods, Final classes, Abstract methods and classes

UNIT - IV

Interfaces: Defining interfaces, Extending interfaces, Implementing interfaces, Accessing interface variables, Multiple Inheritance using interfaces,

Exceptions: Types of errors: Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements

UNIT - V

Multithreaded Programming: Introduction, Lifecycle of a Thread, Creating Threads, Extending the Threads, Stopping and Blocking a Thread

Applet Programming: Definition, Local and remote applets, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state, Building Applet code
Packages: Introduction, Java API Packages, Creating Packages, Accessing a Package

Text Books:

1. E.Balaguruswamy, Programming with JAVA, A primer 3e, TATA McGraw-Hill Company

Reference Books:

1. Programming in Java by Sachin Malhotra, OXFORD University Press
2. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.
3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
4. Deitel & Deitel. Java TM: How to Program, PHI (2007)
5. Java Programming: From Problem Analysis to Program Design- D.S Mallik
6. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year III Semester
Object Oriented Programming through Java Lab**

1. WAP to find whether a number is prime or not
2. WAP to demonstrate the factorial of a number.
3. WAP to display a number is even or odd
4. WAP to find a sub string in the given string.
5. WAP to arrange the given strings in Alphabetic Order.
6. WAP to search an element using arrays
7. WAP to implement Addition and multiplication of two Matrices.
8. WAP to demonstrate the use of Constructor.
9. WAP to demonstrate the use of overriding Method.
10. WAP for single Inheritance.
11. WAP for implementing Interface.
12. WAP on Multiple Inheritance.
13. WAP for to implement Thread
14. WAP to demonstrate Exception handling.
15. WAP to demonstrate Applet program.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year III Semester
Operating Systems

UNIT - I

Operating System Introduction: Operating Systems Objectives and functions, Computer System Architecture, OS Structure, Evolution of Operating Systems (Simple Batch, Multi programmed, Distributed Systems, Real-Time Systems), Operating System services, System Calls, Types of System Calls

UNIT- II

Process and CPU Scheduling - Process concepts - The Process, Process State, Process Control Block, Process Scheduling - Schedulers, Non-Preemptive (FCFS, SJF) and preemptive Scheduling algorithms (RR), **Threads:** Definition, uses of threads, types of threads

UNIT- III

File System Interface – Files: Introduction to files, File types, basic operations on files, file attributes, File Access methods, File Sharing, Protection, File System Structure, **Directories:** Introduction to directories, Directory Structure,
Mass Storage Structure - Overview of Mass Storage Structure, Disk Structure, Disk Attachment

UNIT -IV

Deadlocks - System Model, Deadlock Characterization,
Methods for Handling Deadlocks: Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

UNIT- V

Memory Management and Virtual Memory - Logical & physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table. Segmentation, Segmentation with Paging

Text Books:

1. Operating system Concepts: Abraham Silberschatz, Peter B. Galvin, Greg Gagne, 8th Edition, Wiley.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

Reference Books:

1. Principles of Operating Systems by Naresh Chauhan, OXFORD University Press
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.
3. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year III Semester
Operating Systems Lab

1. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
2. Developing applications using Inter Process Communication (using shared memory)
3. Implement any two memory management schemes
4. Implement file allocation techniques (Linked)
5. Implement Deadlock prevention algorithm.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Round robin. Compute and print the average waiting time and average turnaround time.
7. Implement file allocation techniques (Indexed)
8. Implement file allocation techniques (Contiguous)
9. Developing applications using Inter Process Communication (pipes)
10. Developing applications using Inter Process Communication (message queues)
11. Implement Deadlock detection algorithm.
12. Implement Deadlock avoidance algorithm.

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year IV Semester
Cyber Laws**

UNIT- I

Introduction: Computers and its Impact in Society, Overview of Computer and Web Technology, Need for Cyber Law, *Cyber* Jurisprudence at International and Indian Level.

UNIT -II

Cyber Law- International Perspectives: UN & International Telecommunication Union (ITU) Initiatives, Council of Europe -Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation (APEC), Organization for Economic Co-operation and Development (OECD), World Bank, Commonwealth of Nations.

UNIT -III

Constitutional & Human Rights Issues in Cyberspace: Freedom of Speech and Expression in Cyberspace, Right to Access Cyberspace – Access to Internet, Right to Privacy, Right to Data Protection.

UNIT -IV

Cyber Crimes & Legal Framework: Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud, Cyber terrorism, Cyber Defamation, Different offences under IT Act, 2000.

UNIT -V

Cyber Torts: Different Types of Civil Wrong under the IT Act, 2000, Intellectual Property Issues in Cyber Space, Interface with Copyright Law, Interface with Patent Law, Trade marks & Domain Names Related issues

Text Book:

1. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi, (2012).

Reference Books:

2. Chris Reed & John Angel, Computer Law, OUP, New York, (2007).
3. Verma K, Mittal Raman, Legal Dimensions of Cyber Space, Indian Law

- Institute, NewDelhi,(2004)
4. Jonthan Rosenoer, Cyber Law, Springer, New York, (1997).
 5. Sudhir Naib, The Information Technology Act, 2005: A Hand book, OUP, NewYork, (2011)
 6. S.R.Bhansali, Information Technology Act,2000, University Book House Pvt. Ltd., Jaipur (2003).
 7. Vasu Deva, Cyber Crimes and Law Enforcement, Common wealth Publishers, New Delhi,(2003).

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year IV Semester
Cyber Laws Lab**

1. Write a program for recovering deleted files from a hard disk.
2. Write a program for gathering evidence.
3. Write a program for viewing files of various formats.
4. Write a program for locating files needed for a forensics investigation.
5. Write a program for performing image and file conversions.
6. Write a program for handling evidence data.
7. Write a program for creating a disk image file of a hard disk partition.
8. Give at least ten cyber crime scenarios to students and make them analyse the scenario and submit report citing cyber laws which are violated.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Data Mining and Data Ware Housing

UNIT - I

Introduction: What Motivated Data Mining? Why Is It Important?, So, What Is Data Mining? , Data Mining—On What Kind of Data?: Data Mining Functionalities—What Kinds of Patterns Can Be Mined? Data Preprocessing: Why Preprocess the Data?, Data Cleaning, Data Integration and Transformation, Data Reduction.

UNIT - II

Data Warehouse and OLAP Technology: An Overview , What Is a Data Warehouse? , A Multidimensional Data Model, From Tables and Spreadsheets to Data Cubes, Stars, Snowflakes, and Fact Constellations: Schemas for Multidimensional databases, Examples for Defining Star, Snowflake and Fact Constellation Schemas, Data Warehouse Architecture: Steps for the Design and Construction of Data Warehouses,

UNIT- III

Mining Frequent Patterns, Associations, and Correlations: Basic Concepts and a Road Map, Efficient and Scalable Frequent Item set Mining Methods: The Apriori Algorithm: Finding Frequent Item sets Using Candidate Generation, Generating Association Rules from Frequent Item sets.

UNIT -IV

Classification and Prediction: What Is Classification? What Is Prediction? , Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Decision Tree Induction, Attribute Selection Measures. Rule-Based Classification: Using IF-THEN Rules for Classification

UNIT -V

Cluster Analysis: What is Cluster Analysis? , Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods. Hierarchical Methods: Agglomerative and Divisive Hierarchical Clustering.

Text Book:

1. Data Mining: Concepts and Techniques Second Edition Jiawei Han University of Illinois at Urbana-Champaign Micheline Kamber
2. Data Warehousing by Reema Thareja, Oxford University Press

References:

1. Data Mining by Vikram Pudi, P. Radha Krishna, Oxford Universal Press
2. J. Han, M. Kamber and J. Pei, Data Mining: Concepts and Techniques, 3rd.Edition Morgan Kaufmann, 2011
3. Introduction to data mining –G. K. Gupta, PHI
4. Data mining, Data warehouse &Olap-Berson, Tata McGraw Hill

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year IV Semester
Data Mining And Data Ware Housing Lab**

1. Demonstration of preprocessing on dataset student.arff.
2. Demonstration of preprocessing on dataset labor.arff.
3. Demonstration of Association rule process on dataset contactlenses.arff using Apriori algorithm.
4. Demonstration of Association rule process on dataset test.arff using Apriori algorithm.
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm.
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm.
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm.
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm.
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means.
10. Demonstration of clustering rule process on dataset student.arff using simple k-means.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Web Programming

Course Objective

1. To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
2. To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

UNIT-I

Introduction to Internet: Definition of Internet – History of Internet – Advantages & disadvantages of Internet – Tools of internet - How internet works. **Introduction to WWW:** Definition of WWW – WWW tools - Web Terminology – web browser – web server
E-Mail : Definition of e-mail – advantages & disadvantages of e-mail, message components

UNIT-II

Introduction to HTML: Basic HTML – HTML document structure – HTML tags – Basefont tag – title tag – body tag – Horizontal Rule Tag - Text formatting tags – Character tags - Character entities
HTML Lists : Ordered List , Unordered List & Definition List – Using colors – Using Images
Hyperlinks: Textual links, Graphical links, types of document links, anchor tag

UNIT -III

HTML Tables – table creations tags, Nested Tables
Frames: Frame introduction - frame creation tags – Nested Frames – **Forms:** Form Controls : textbox, button, password, checkbox, radio button, select, text area - Processing of forms

UNIT – IV

Introduction to Scripting: JavaScript Introduction - Simple Program - Obtaining User Inputs with Prompt Dialogs - variables – operators (arithmetic, relational, logical, increment and decrement). **JavaScript – Control Statements:** Introduction – conditional control statements (if, if...else, switch) – Repetitive statements (for, while, do...while) - break and continue Statements

UNIT – V

JavaScript Functions: Introduction - Program Modules in JavaScript - Programmer-Defined Functions - Function Definitions - Scope Rules - JavaScript Global Functions

Advanced HTML : Cascading Style Sheets (CSS): Introduction – Using Styles: As an attribute, tag & external file – Defining Your own styles – **Properties and values :** properties related to Fonts , Backgrounds & colors, text , boxes & borders

Prescribed Books:

1. Chris Bates, Web Programming Building Internet Applications, Second Edition, Wiley.
2. Deitel & Deitel , Goldberg “Internet and world wide web – How to program”, pearson educations Asia

Reference Books:

1. Paul S.Wang Sanda S. Katila, An Introduction to Web Design Plus Programming,Thomson.
2. Robert W.Sebesta, Programming the World Wide Web, Third Edition, Pearson Education.
3. Joel Sklar, Principles of Web Design, Thomson.
4. Raj Kamal, Internet and Web Technologies, Tata McGraw Hill.
5. Gopalan & Akilandeswari, Web Technology: A Developer’s Perspective, PHI.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Web Programming Lab

1. Create a simple HTML page which demonstrates all types of lists.
2. Create a letter head of your college using following styles
 - i. image as background
 - ii. use header tags to format college name and address
3. Create a web page, which contains hyper links like fruits, flowers, animals. When you click on hyper links, it must take you to related web page; these web pages must contain with related images.
4. Create a hyperlink to move around within a single page rather than to load another page.
5. Create a leave letter using different text formatting tags.
6. Create a table format given bellow using row span and colspan.

RNO	NAME	MARKS				
		M1	M2	M3	M4	M5

Insert 5 records.

7. Create a table with different formats as given bellow.
 - i. Give different background and font colors to table header, footer and body.
 - ii. Use table caption tag.
8. Write java script to find factorial of a number
9. Write java script to find sum of digits of a number
10. Write java script to display student details in a web page
11. Create a student Bio-Data, using forms.
12. Create a web page using following style sheets
 - i. Inline style sheets.
 - ii. Embedded style sheets.
 - iii. External style sheets

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year IV Semester
Design of Object Oriented Applications**

Course Objectives:

1. To teach the realistic application of object-oriented analysis and design within a variety of problem domain.

Course Outcomes:

By the end of the course, student will be able to:

1. Have Knowledge in micro and macro process.
2. Have Knowledge in management planning, quality assurance and metrics along with documentation of object oriented development.
3. Have Knowledge in system architecture.
4. Basic knowledge in AI and Data Acquisition.
5. Knowledge in applications of Object Oriented Design.

UNIT- I:

Process-First Principles: Traits of Successful Projects: Strong Architectural Vision, Iterative and Incremental Lifecycle. **The Macro Process:** The Software Development Lifecycle, Overview, The Macro Process Content Dimension-Disciplines, The Macro Process Time Dimension-Milestones and Phases, The Macro Process Time Dimension-Iterations, Release Planning.

The Micro Process: The Analysis and Design Process, Overview, Level of Abstraction, Activities, Products, The Micro Process and Level of Abstraction, Identifying Elements, Defining Elements of Collaborations, Defining Element Relationships, Detailing Element Semantics.

UNIT- II:

Pragmatics-Management Planning: Risk Management, Task Planning, Development Review.

Staffing: Resource Allocation, Development Team Roles. **Release Management:** Configuration Management and Version Control, Integration, Testing. **Reuse:** Elements of Reuse, Institutionalizing Reuse. **Quality Assurance and Metrics:** Software Quality, Object-Oriented Metrics. **The Benefits and Risks of Object-Oriented Development:** The Benefits of Object Oriented Development, the Risk of Object Oriented Development.

UNIT- III:

System Architecture: *Satellite-Based Navigation:* Inception, Elaboration, Construction, Post- Transition.

Control System: *Traffic Management:* Inception, Elaboration, Construction, Post-Transition.

UNIT- IV:

Artificial Intelligence: *Cryptanalysis:* Inception, Elaboration, Construction, Post-Transition.

Data Acquisition: *Weather Monitoring station:* Inception, Elaboration, Construction, Post-Transition.

UNIT- V:

Web Application: *Vacation Tracking System:* Inception, Elaboration, Construction, Transition and Post-Transition.

Object-Oriented Programming Languages: Language Evolution, Smalltalk, C++, Java.

Text Book:

1. Object-Oriented Analysis and Design with Applications, 3rd Edition, By: Robert A. Maksimchuk, Bobbi J. Young, Grady Booch, Jim Conallen, Michael W. Engel, Kelli A. Houston, Pearson education.

Reference Books:

1. Grady Booch, Object Oriented Analysis and Design with Applications, 2nd Edition, Pearson education 1999.

2. Jacobson ed al., The Unified Software Development Process, A W 1999.

3. Tom Pender,UML Bible, John Wiley and sons.

**Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year**

**BCA II Year IV Semester
Design of Object Oriented Applications Lab**

1. Develop a mini project for Satellite-Based Navigation.
2. Develop a mini project for Traffic Management.
3. Develop a mini project for Cryptanalysis.
4. Develop a mini project for Weather Monitoring Station.
5. Develop a mini project for Vacation Tracking System.

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Data Analytics Using R

Course Objectives:

After completing the course, student will learn,

1. Exposure to theory as well as practical knowledge through R used in data analytics. Fundamental basics of statistics used in analysing the data
2. How to find the pattern in the given dataset
3. How to interpret the data graphically
4. How to apply different types of algorithms for the given dataset

Course Outcomes:

1. Data-Visualization tools and techniques offer executives and other knowledge workers new approaches
2. Data visualization is a general term that describes any effort to help people understand the significance of data by placing it in a visual context.
3. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization software.
4. It isn't just the attraction of the huge range of statistical analyses afforded by R that attracts data people to R. The language has also developed a rich ecosystem of charts, plots and visualizations over the years.

UNIT - I

Introduction to Data analytics: Overview of Bigdata, Need of Data Analytics, Applications of Data Analytics, Datasets, tools for data analytics

Basic Statistics: Mean, Median, mode, Standard Deviation, Variance, Correlation.

Distribution: normal, binomial.

UNIT-II

Basic Analysis Techniques: Chi-Square Test, t-Test. **Data Analysis Techniques:** Linear and Logistic Regression.

Introduction to R: R overview and history, Basic features of R, Installing R, packages in R, Getting started: Window section of RStudio, first interaction, command line versus scripts, comments. Variables in R: Naming variables, assigning values to variables, finding variables, removing variables, operators.

R Data Structures: Vectors, Character Strings, Matrices, Lists, Data Frames, and Classes.

UNIT-III

Input of Data: input of data from terminal, input of data through R-objects. **Output functions:** print () function, cat () function. **In-Built functions in R:** Mathematical functions, String functions. **User defined functions** – function without arguments, function with arguments.

Decision making structure: simple if statement, if-else statement, switch statement. **Loops:** while loop, for loop, Repeat loop.

UNIT-IV

Data Types of R

Vectors: class of a vector, Elements of a vector, accessing vector elements, functions for vectors, obtaining the Length of a Vector. **Common vector operations:** Arithmetic & logical operations, Vector Indexing, using all () and any () functions, Vectorized operations, NA and NULL values.

Matrices: creating a matrix, accessing matrix elements, functions for matrices, matrix indexing, filtering on matrices. **Arrays:** creating an array, accessing elements of an array, functions for array.

UNIT-V

Lists: creating a list, accessing list elements, functions for list, General list operations, list indexing, adding and deleting list elements.

Import and Export of data: Import and export of data in excel file:reading from excel format, write to excel format.

Data Visualization techniques: Introduction, pie chart, bar chart, scatter and box plots.

Text Books:

1. Data Analytics with R, WILEY Publishing , Dr.Bharti Motwani.
2. The Art of R Programming by Norman Matlof, No starch press, SAN FRANCISCO,2011.
3. Data Analytics using R, McGrawHill Publications, Seema Acharya

Reference Books:

1. Rumset D. J. (2010): Statistical Essentials for Dummies. Hoboken: Wiley Publishing
2. R for Data Science: Import, Tidy, Transform, Visualize, and Model Databy adley ickham , O'Reilly

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Data Analytics using R Lab

1. Write a program in R. To compute the product of two values.
2. Write a program in R. to check whether the given number is even or odd.
3. Write a program in R. Sum of natural numbers.
4. Write a program in R. Find the factorial.
5. Exporting data to Excel, Text File
6. Mean, Median, Standard Deviation, Variance, Correlation in R
7. Correlation in R: Pearson & Spearman with Matrix Example
8. T Test in R
9. Chi-Square Test in R
10. Prediction using linear regression and visualizing the regression graphically
11. Prediction using logistic regression and visualizing the regression graphically
12. Bar chart in R

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Object Oriented Software Engineering

Course Objectives:

1. Illustrate basic taxonomy and terminology of the software engineering.
2. Plan and monitor the control aspects of project.

Course Outcomes:

1. Explore the basic concepts of software engineering.
2. Choose appropriate life cycle model for a project.
3. Implement the phases of the traditional software development process.
4. Design various test cases for a software product.
5. Analyze different architectural views.

UNIT –I

The Scope of Object Oriented Software Engineering:

Historical Aspects, Economic Aspects, Maintenance Aspects, Requirements, analysis and design aspects, the object oriented Paradigm, Terminology, Ethical Issues.

Software Life Cycle Models: Software Development In Theory, Risks and other aspects of Iteration and Incrementation, Managing Iteration and Incrementation, other Life Cycle Models: Code and Fix, Waterfall, Rapid Prototyping, Open Source, Agile Processes, Synchronize and Stabilize, Spiral Models, Comparison of Life Cycle Models.

UNIT-II

The Software Process : The Unified Process, Iteration and Incrimination, The Requirements Workflow, The Analysis workflow, The Design Workflow ,The Implementation workflow, the test workflow, Post Delivery Maintenance, Retirement, the phases of the unified process, one-versus two-dimensional life cycle models, improving the software process, capability maturity models, costs and benefits of software process improvement.

UNIT-III

Models to Objects: What is a module? Cohesion, Coupling, Data Encapsulation, Abstract Data Types, Information Hiding, Objects, Inheritance, Polymorphism and Dynamic Binding, The Object-Oriented Paradigm.

Reusability and Portability: Objects and Reuse, Reuse during design and implementation reuse and post delivery maintenance, portability, techniques for achieving portability.

Planning and Estimating: planning and the software process, Estimating duration and cost.

UNIT-IV

The Requirements workflow: Determining what client needs , overview of the requirements, understanding the domain, the business model, initial requirements, rapid prototyping , human factors, reusing the rapid prototype, metrics for the requirement workflow.

The Analysis Workflow: the analysis workflow, extracting the entity classes.

The Design Workflow: Object –Oriented Design, the design workflow, formal techniques for detailed design, real time design techniques.

UNIT-V

The implementation workflow: choice of programming languages, good programming practice, coding standards, code reuse, integration, the implementation workflow.

Testing: Quality Issues, Non – Execution based testing, execution based testing, what should be tested?, testing versus correctness proofs. Test case selection, Black Box Unit Testing techniques, Glass-Box Unit Testing Techniques.

Text book:

Stephen R.Schach -Object Oriented Software Engineering McGraw Hill Higher
Education

Reference book:

Timothy C.Lethbridge, Robert Language Object Oriented Software Engineering

Andhra Pradesh State Council of Higher Education
Bachelor of Computer Applications Syllabus under CBCS
w.e.f 2020-2021 Academic Year

BCA II Year IV Semester
Object Oriented Software Engineering Lab

Design Following Systems in Object Oriented Approach using UML with open source tools
(Eclipse UML2 or any other Open source tools):

- 1 Online Examination System.
- 2 Online Railway Reservation.
- 3 Library Maintenance System.
- 4 Any E-Commerce Portal.
- 5 Biometric Attendance System.

Note: Student is expected to analyze the system in object oriented manner and design the system in object oriented approach using UML with open source tools

} **ALL SEMESTERS** }
MODEL QUESTION PAPER

Time: 3 Hours

Max. Marks : 75

SECTION-A

Answer any FIVE of the following Questions:

(5 x 5= 25 Marks)

- | | | | |
|-----|--------|---|---|
| 1. | | } | |
| 2. | UNIT-1 | | } |
| 3. | | | } |
| 4. | UNIT-2 | | |
| 5. | | | |
| 6. | UNIT-3 | } | |
| 7. | | } | |
| 8. | UNIT-4 | } | } |
| 9. | | } | } |
| 10. | UNIT-5 | | |

SECTION - B

Answer any FIVE of the following Questions

(5 x 10 =50 Marks)

- | | | | |
|-----|--------|---|--|
| 11. | | } | |
| 12. | UNIT-1 | | |
| 13. | | | |
| 14. | UNIT-2 | | |
| 15. | | | |
| 16. | UNIT-3 | | |
| 17. | | } | |
| 18. | UNIT-4 | } | |
| 19. | | } | |
| 20. | UNIT-5 | | |

Note: Paper Setter must select TWO short questions and TWO essay questions from each unit.