RANI CHANNAMMA UNIVERSITY BELAGAVI

REVISED CURRICULUM FRAMEWORK FOR
UNDER GRADUATE COURSE

STRUCTURE & SYLLABUS OF BACHELOR OF COMPUTER APPLICATION

BCA

1ST TO 2ND Semesters

w.e.f.

Academic Year 2024-25 and Onwards

Submitted by

Chairman,
Board of Studies (UG),
Bachelor of Computer Science,

PROGRAM OUTCOMES:

By the end of the program the following outcomes will be achieved by the students:

o Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity

o Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.

o Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.

o Programming a Computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.

o Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.

o Modern Tool Usage: Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.

o Communication: Must have a reasonably good communication knowledge both in oral and writing.

o Project Management: Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.

o Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.

Revised Course Structure and Syllabus

Part	Course Code	Subject Name	Teaching Hrs / week	Practical Hrs / week	Examination				Credits
					Exam Duration Hrs	Marks			
						IA	Theory / Practical	Total	
I Semester BCA w.e.f 2024-25 and onwards									
Part I AECC	SEPBCAAEC 1.1	Language 1	4	-	3	20	80	100	3
	SEPBCAAEC 1.2	Language 2	4	-	3	20	80	100	3
Part II DSC	SEPBCAT1.3	Computer Concepts and C Programming	4	-	3	20	80	100	3
	SEPBCAT1.4	Database Management System	4	-	3	20	80	100	3
	SEPBCAT1.5(a) / SEPBCAT1.5(b)*	Accountancy / Mathematics-I	4	-	3	20	80	100	3
	SEPBCAP1.6	C Programming Lab	-	4	3	10	40	50	2
	SEPBCAP1.7	Database Management System Lab	-	4	3	10	40	50	2
	SEPBCAP1.8	Office Automation lab	-	4	3	10	40	50	2
Part III SEC	SEPBCAAEC 1.9	Compulsory 1 (Constitutional Values)	2	-	2	10	40	50	2
Total			22	12				700	23

Note- * BCADSC 1.5(a) – for students from Science Background / BCADSC 1.5(b)* for students from Non- Science Background

Part	Course Code	Subject Name	Teaching Hrs / week	Practical Hrs / week	Exam Duration Hrs	IA	Theory / Practical	Total	Credits
					Examination		**Marks**		**Credits**
Part I AECC	SEPBCAAEC 2.1	Language 1	4	-	3	20	80	100	3
	SEPBCAAEC 2.2	Language 2	4	-	3	20	80	100	3
Part II DSC	SEPBCAT 2.3	Data Structures and Algorithms	4	-	3	20	80	100	3
	SEPBCAT 2.4	Numerical and Statistical Methods	4	-	3	20	80	100	3
	SEPBCAT 2.5	Object Oriented Programming Using Java	4	-	3	20	80	100	3
	SEPBCAP 2.6	Data Structures and Algorithms Lab	-	4	3	10	40	50	2
	SEPBCAP 2.7	Numerical and Statistical Methods Lab	-	4	3	10	40	50	2
	SEPBCAP 2.8	Object Oriented Programming Using Java Lab	-	4	3	10	40	50	2
Part III SEC	SEPBCAAEC 2.9	Compulsory 2 (Constitutional Values)	2	-	2	10	40	50	2
Total			22	12				700	23

II Semester BCA w.e.f 2024-25 and onwards

Year	I	Course Code: SEPBCAT1.3	Credits	3
Semester	I	Course Title: Computer Concepts and C Programming	Hours	48
Course Pre-requisite, if any		NA		
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: o Understand classification of computers, its features and parts, software and its types o Apply techniques of problem solving to design C code o Read, understand and trace the execution of programs written in C language o Apply programming control structures for a given problem to create C code o Understand derived datatypes and develop C code using arrays/ strings o Understand user defined functions and datatypes to develop C code		

Unit No	Course Content	Hours
Unit-1	Introduction: Computer, data processing, characteristic features of computers, Basic operations performed by computers, basic organization of computer system Number systems: Different types- decimal, binary, octal, and hexadecimal number systems, Conversion from decimal to binary and vice- versa Software: Software and its relationship with hardware, types of software, system software, application software, firmware, middleware, Computer languages: Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler	10
Unit-2	Steps for Problem Solving: Flowcharts, Algorithms; Examples of flow charts and algorithms- Largest of three numbers, reversing the digits of an integer, GCD of two integers, generating prime numbers, computing n Fibonacci numbers. Introduction to C Programming: Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.	10
Unit-3	Input and output with C: Formatted I/O functions - printf and scanf, control strings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions. Character handling library functions - toascii, toupper, tolower, isalpha, isnumeric C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators, Operator Precedence and Associatively; Evaluation of arithmetic expressions; Mathematical library functions in C using math.h; Type casting & conversion.	8
Unit-4	Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue statements; Looping Statements - Entry controlled and exit controlled statements, while, do-while, for loops, Nested loops. Strings: String constant and variables, Declaration and initialization of string, Input/output of string data. String Library Functions: strlen, strcat, strcmp, strcpy, strrev.	10

Unit-5	Arrays: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. User defined functions: Definition, types of user defined functions, prototype, Local and global variables, passing parameters, recursion Structures & Union: Definition of Structure, declaring Structure, accessing Structure elements, array of Structure, Nesting of structure. Definition of Union, declaring and using Union, Difference between Structure & Union.	10

Text Books:
1. Fundamentals of Computers, E. Balaguruswamy (McGraw Hill)
2. Anil V. Choudhuri, The Art of Programming through Flowchart and Algorithms, Laxmi Pub.
3. E. Balaguruswamy: Programming in ANSI C (TMH)
4. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
5. V. Rajaraman: Programming in C (PHI –EEE)
6. P.B. Kottur: Programming in C (Sapna Book House)

References:
1. P. K. Sinha & Priti Sinha: Computer Fundamentals (BPB)
2. C: The Complete Reference, By Herbert Schildt.
3. Kernighan & Ritchie: The C Programming Language (PHI)
4. S. Byron Gottfried: Programming with C (TMH)
5. Yashwant Kanitkar: Let us C

Year	I	Course Code: SEPBCAT1.4	Credits	3
Semester	I	Course Title: Database Management System	Hours	48
Course Pre-requisite, if any		NA		
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: o Explain the various database concepts and the need for database systems. o Identify and define database objects, and enforce integrity constraints on a database using DBMS. o Demonstrate a Data model and Schemas in RDBMS. o Identify entities and relationships and draw an ER-diagram for a given real-world problem. o Convert an ER diagram to a database schema and deduce it to the desired normal form. o Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.		

Unit No	Course Content	Hours
Unit-1	Introduction to Database System Concepts and Architecture Databases and Database Users, Characteristics of the Database Approach, Actors on the Scene, Advantages of Using a DBMS Data Models, Schemas and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment.	10
Unit-2	Data Modelling Using the Entity-Relationship Model Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types, ER Diagrams, Naming Conventions and Design Aspects.	10
Unit-3	Relational Data Model, Relational Constraints, and Relational Algebra Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Basic Relational Algebra Operations: SELECT, PROJECT, RENAME. Examples of simple Queries in Relational Algebra.	10
Unit-4	Normalization- Functional Dependencies, Transitive and Multivalued Dependencies, First Normal Form, Second Normal Form, Third Normal Form,	8
Unit-5	Introduction to SQL: SQL and its features, SQL Data types, DDL: Create tables (with constraints), Alter tables, DML: Insert, Update, Delete Operations, Queries: Simple Queries, select with WHERE clause, ORDER BY clause and aggregate functions, Using operators like BETWEEN, IN, ANY, ALL and computations in queries, Simple Queries using all clauses. More on SQL: Joins, types of joins, queries with GROUP BY clause, queries with HAVING clause, views and their relevance, creating and using views, simple example queries for joining tables and using GROUP BY and HAVING clause.	10

TextBooks:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015.
2. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.

References:

1. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
2. Introduction to Database System, C J Date, Pearson, 1999.
3. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition,
4. McGraw Hill, 2002

Year	I	Course Code: SEPBCAT1.5(a)	Credits	3
Semester	I	Course Title: Accountancy	Hours	48
Course Pre-requisite, if any		Students should have studied Science in PU/12ᵗʰ level		
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: ○ Understand accounting, branches of accounting and its role. ○ Know the concepts of accounting and accounting process. ○ Maintenance of different accounting books. ○ Preparation of final accounts.		

Unit No	Course Content	Hours
Unit-1	Introduction to Accounting: Meaning of book-keeping, accounting and accountancy. Accounting – objectives, scope & functions. Book Keeping Vs Accounting. Users of accounting information. Systems of Accounting – Single entry system & Double entry system, differences. Branches of Accounting. Accounting equation. Important accounting terms.	10
Unit-2	Accounting Principles – Concepts & Conventions: Generally Accepted Accounting Principles, Accounting Policies, Principles vs Polices. Accounting cycle. Classification of Accounts – British System & American System. Rules of Accounting, i.e. Debit & Credit rules under British System & American System. Journal – meaning, features, format & journalising. Ledger – meaning, features, format, ledger posting, balancing a ledger account. Journal vs Ledger. Preparation of personal ledger account.	09
Unit-3	Subsidiary Books: Meaning, features & advantages. Types – Purchase Book, Purchase Returns Book, Sales Book, Sales Returns Book, Cash Book (Simple Cash Book & Three Column Cash Book) Meaning of terms – discount, cash discount, trade discount, invoice, debit note, credit note, contra entry, voucher, receipt, pass book, etc.	09
Unit-4	Bank Reconciliation Statement: Meaning & need. Reasons for difference between cash book balance and pass book balance. Preparation of BRS. Advantages.	10
Unit-5	Final Accounts: Meaning, need & objectives. Trial Balance – meaning, objectives, format & preparation. Meaning & objectives of preparation of Trading Account, Profit & Loss Account and Balance Sheet. Meaning of Gross Profit, Gross Loss, Net Profit, Net Loss, Depreciation, Bad Debts, Outstanding Expenses, Prepaid Expenses, Capital, and Assets & Liabilities. Simples problems on preparation of Trading Account, Profit & Loss Account and Balance Sheet [Sole Trading Concerns only]	10

Text books:

1. Book Keeping & Accountancy by M. B. Kadkol
2. Accountancy by B. S. Raman
3. Book Keeping & Accounting by V. A. Patil & J. S. Korlahalli

References:

1. Dr. R.K. Mittal & M.R. Bansal, Financial Accounting, VK Publications.

2. Anil Chowdhry, Fundamentals of Accounting & Financial Analysis, Pearson Education.

3. Maheshwari & Maheshwari, An Introduction to Accountancy, 11th Edition, Vikas Publishing House.

4. Jane Reimers, Financial accounting, Pearson Education

5. Rajni Preeti HiroSofat, Basic Accounting, PHI Additional Reading:

6. Accounting for management, Bhattacharya & Deaden, Paperback Edition, Vikas 1986

7. Financial Accounting (Part I and Part II), R.L Gupta & V.K Gupta

8. Maheshwari S.N., Principles of Management Accounting, Sultan Chand & Sons,

9. Accounting Principal, Antony & Reece, Sixth Edition

Year	I	Course Code: SEPBCAT1.5(b)	Credits	3
Semester	I	Course Title: Mathematics –I	Hours	48
Course Pre-requisite, if any		Students should have studied Commerce in PU/12th level		
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: o To perform basic arithmetic operations and roots on complex numbers. o Apprehend types of Sequences & Series and relationship between them. o Understand Expansion of Binomial Expression and coefficient, Pascal's triangle and find the any term in the expansion. o Explore the basic concepts of trigonometry, including sine, cosine, and tangent functions and Standard Angles, Allied Angles. o Understand the basic concepts of Distance Formulae, Section Formulae, Slope of a Line and Angle between Two Lines. Various Forms of Equations of a Line		

Unit No	Course Content	Hours
Unit-1	Complex Numbers: Complex Numbers; Conjugate of a Complex Number; Modules of a Complex Number; Geometrical Representation of Complex Number; De Moivere'sTheorem; nth Roots of a Complex Number.	10
Unit-2	Sequence And Series: Arithmetic Progression (A P),Arithmetic Men (A M), Geometric Progression (G P),General Term of a G P, Sum of N Terms of a G P. Arithmetic and Geometric Series, Infinite G P and its Sum, Geometric Mean(G M) Relation Between A M and G M	10
Unit-3	Binomial Theorem: Statement of the Binomial Theorem For Positive Integral Indices, General And Middle Term in Binomial Expansion, Simple Applications. Quadratic Equations: Solution Of Quadratic Equations by Factor Method, Complete Square Method, And Discriminant Method, Relation Of The Roots.	10
Unit-4	Introduction To Trigonometry: Trigonometry Ratio's, Trigonometric, Functions of Standard Angles,Allied Angles, CompoundAngles, Multiple & Sub Multiple Angles, Transformation Formula	9
Unit-5	Co-Ordinate Geometry: Distance Formulae, Section Formulae, Shifting Of Origin. Slope of a Line And Angle Between Two Lines. Various Forms of Equations of A Line: Parallel To Axes, Point Slope Form, Slope-Intercept Form, Two-Point Form, Intercepts Forms And Normal Form, General Equation of a line. Equation of Family of Lines Passing Through The Point of Intersection of Two Lines. Distance of A Point From A Line.	9

Text Books
1. 11th& 12th NCERT Mathematics books.
2. B. S. Grewal, Elementary engineering mathematics, Khanna publishers

References:
1. S. L. Loney, M. A., the elements of coordinate geometry, scholarly publishing office, university of Michigan library
2. S. L. Loney, M. A., plane trigonometry, scholarly publishing office, university of Michigan libraray

Year	I	Course Code: SEPBCAP1.6	Credits	2
Semester	I	Course Title: C Programming Lab	Hours	48
Course Pre-requisite, if any		NA		
Formative Assessment Marks: 10		Summative Assessment Marks: 40	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: o Get familiar with working in Linux environment using basic shell commands such as ls, cd, mv, mkdir, rm, cat,etc. o Write algorithms and design flowcharts to solve problems o Use vi/gedit/any terminal editor for writing C programs o Use Linux-Open Source OS for debugging and executing C programs using gcc/similar compiler available with Linux.		

Lab Assignments (To be implemented using C Programming Language)

Part A

1. Write a program to read radius of a circle and to find and display area and circumference
2. Write a program to read Principal amount, Time and Rate and calculate Simple Interest.
3. Program to read three numbers and display the largest of the three.
4. Write a program to function as a basic calculator; it should ask the user to input what type of arithmetic operation he would like, and then ask for the numbers on which the operation should be performed. The calculator should then give the output of the operation. Use switch. Error message should be reported, if any attempt is made to divide by zero.
5. Write a program to find the roots of quadratic equation (Demonstration of else-if ladder)
6. Write a program to read marks scored by a student in n subjects and find and display the average of all marks
7. Write a program to demonstrate basic mathematical library functions defined in math.h
8. Write a program to find HCF (GCD) of two numbers.
9. Write a program that accepts a number 'n', and prints all prime numbers between 1 to n.
10. Write a program to read a number, find the sum of its digits, reverse the number and check if it is a palindrome. Display appropriate message.
11. Write a program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers. Display appropriate error messages.
12. Write a program to read percentage of marks and to display appropriate message specifying class obtained. (demonstration of Switch Case statement)
13. Write a program to read and concatenate two strings without using library function
14. Write a program to print sum of even numbers and sum of odd numbers from array of integers which are to be inputed.
15. Write a program to read a list of numbers, print it, then remove duplicate elements from the list and print the modified list. Use single dimensional Array

Part B

1. Write a program to swap(interchange) two numbers without using a temporary variable
2. Write a program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters using character functions
3. Write a program to read a string, reverse it, concatenate the original string with its reverse, and print length of the original string and the concatenated string using built in functions
4. Write a program to read a string and find the length of a string without using built in function
5. Write a program to generate and display first n values in the Fibonacci sequence using recursive function

6. Write a recursive function calculate factorial of a given integer, n.
7. Write a program to read elements in a square matrix, display it in the form of a matrix and find and print its trace
8. Write a program to read two matrices and perform addition and subtraction on them
9. Write a program to read, display and multiply two m x n matrices using functions.
10. Write a program to check and display if a number is prime by defining isprime( ) function
11. Write a program using functions that takes in three arguments - a start temperature (in Celsius), an end temperature (in Celsius) and a step size. Print out a table that goes from the start temperature to the end temperature, in steps of the step size; converting each Celsius to Fahrenheit.
12. Write a C program to create array of structure which stores Roll No, Name and Average marks of students. Accept n students data and print it in proper format.
13. Write a C program to illustrate difference between structure and union by defining emp_no , emp_name, salary as members and display the size of the defined structure

Year	I	Course Code: SEPBCAP1.7		Credits	2
Semester	I	Course Title: Database management System Lab		Hours	48
Course Pre-requisite, if any		NA			
Formative Assessment Marks: 10		Summative Assessment Marks: 40		Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: o Creation and Manipulation of Database o Execute a single line query and group functions. o Execute DDL DML, DCL and TCL commands o Implement the Nested Queries and Join operations in SQL o Create views for a particular table			

Lab Assignments(To be implemented in SQL)

Case Study 1: (Select clause, Arithmetic Operators)
Database: Employee
1.   Create the following tables with suitable constraints and insert tuples.

Table: Employee

Emp_Id	First_Name	Last_Name	Hire_Date	Address	City
1001	Raghav	Patel	11-May-06	83 first street	Belagavi
1002	Mohini	Rathi	25-Feb-08	842 Vine Ave	Athani
1012	Sham	Pujari	12-Sep-05	33 Elm St.	Mysore
1015	Kriti	Dev	19-Dec-06	11 Red Road	Belagavi
1016	Sarath	Sharma	22-Aug-07	440 MG Road	New Delhi
1020	Monika	Gupta	07-Jun-08	9 Bandra	Mumbai

Table : EmpSalary

Emp_Id	Salary	Benefits	Designation
1001	10000	3000	Manager
1002	8000	1200	Salesman
1012	20000	5000	Director
1015	6500	1300	Clerk
1016	6000	1000	Clerk
1020	8000	1200	Salesman

Write queries for the following
1.   Display FIRSTNAME, LASTNAME, ADDRESS, and CITY of all employees living in PARIS.
2.   Display the content of the employee table in descending order of FIRSTNAME
3.   Select the FIRSTNAME and SALARY of the salesman
4.   To display the FIRSTNAME, LASTNAME, AND TOTAL SALARY of all employees from the table EMPLOYEE and EMPSALARY. Where TOTAL SALARY is calculated as SALARY+BENEFITS
5.   List the Names of employees, who are more than 1 year old in the organization
6.   Count the number of distinct DESIGNATION from EMPSALARY
7.   List the employees whose names have exactly 6 characters

8. Add new column PHONE_NO to EMPLOYEE and update the records
9. List employee names, who have joined before 15-Jun-08 and after 16-Jun-07
10. Generate Salary slip with Name, Salary, Benefits, HRA-50%, DA-30%, PF-12%, Calculate gross. Order the result in descending order of the gross.

Case Study 2: (group by, having clause) Database: Bank system
Create the following **table** and insert **tuples** with suitable constraints

Table: Account

Account_No	Cust_Name	Brach_ID
AE0012856	Reena	SB002
AE1185698	Akhil	SB001
AE1203996	Daniel	SB004
AE1225889	Roy	SB002
AE8532166	Sowparnika	SB003
AE8552266	Anil	SB003
AE1003996	Saathwik	SB004
AE1100996	Swarna	SB002

Table: Branch

Branch_ID	Branch_Name	Branch_City
SB001	Malleshwaram	Bangalore
SB002	MG Road	Bangalroe
SB003	MG Road	Mysore
SB004	Jainagar	Mysore

Table: Depositor

Account_No	Branch_Id	Balance
AE0012856	SB002	12000
AE1203996	SB004	58900
AE8532166	SB003	40000
AE1225889	SB002	150000

Table: Loan

Account_No	Branch_Id	Balance
AE1185698	SB001	102000
AE8552266	SB003	40000
AE1003996	SB004	15000
AE1100996	SB002	100000

1. Display the Total Number of accounts present in each branch.
2. Display the Total Loan amount in each branch.
3. Display the Total deposited amount in each branch by descending order.
4. Display max , min loan amount present in each city.
5. Display average amount deposited in each branch, each city.
6. Display maximum of loan amount in each branch where the balance is more than 25000.
7. Display Total Number of accounts present in each city.
8. Display all customer details in ascending order of branch_id.
9. Update Balance to 26000 where account_no=AE1003996.
10. Display Customer Names with their branch Name

Case Study 3: (Logical, Relational Operators)
Database: Library

Create Following **tables** and insert **tuples** with suitable constraints
Table: Books

Book_Id	Book_Name	Author_Name	Publishers	Price	Type	Quantity
C0001	The Klone and I	Lata Kappor	EPP	355	Novel	5
F0001	The Tears	William Hopkins	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	ERP	350	Text	10
T0002	C++ Brainwork"s	A.W.Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Ana Roberts	First Publ.	750	Fiction	50

Table: Issued

Book_Id	Quantity_Issued
T0001	4
C0001	5
F0001	2
T0002	5
F0002	8

Write queries for the following
1. To show Book name, Author name and price of books of First Publ. publisher
2. Display Book id, Book name and publisher of books having quantity more than 8 and price less than 500
3. Select Book id, book name, author name of books which is published by other than ERP publishers and price between 300 to 700
4. Generate a Bill with Book_id, Book_name, Publisher, Price, Quantity, 4% of VAT "Total"
5. Display book details with book id"s C0001, F0001, T0002, F0002 (Hint: use IN operator)
6. Display Book list other than, type Novel and Fiction
7. Display book details with the author name starting with letter "A"
8. Display book details with the author name starting with letter "T" and ending with "S"
9. Select Book_Id, Book_Name, Author Name, Quantity Issued where Books.Books_Id = Issued.Book_Id
10. List the book_name, Author_name, Price. In ascending order of Book_name and then in descending order of price

Case Study 4

Database: Subject

Create Following **table** and insert **tuples** with suitable constraints

Table - Physics

Regno	Name	Year	Combination
AJ00325	Ashwin	First	PCM
AJ00225	Swaroop	Second	PMCs
AJ00385	Sarika	Third	PME
AJ00388	Rupa	First	PMCs

Table – Computer Science

Regno	Name	Year	Combination
AJ00225	Swaroop	Second	PMCs
AJ00296	Tejas	Second	BCA
AJ00112	Geeta	First	BCA
AJ00388	Rupa	First	PMCs

Write queries for the following

1. Select all students from Physics and Computer Science

2. Select students common in Physics and Computer Science

3. Display all student details those are studying in the second year

4. Display students who are studying both Physics and computer science in the second year

5. Display the students studying only physics

6. Display the students studying only Computer Science

7. Select all students having PMCs combination

8. Select all students having a BCA combination

9. Select all students studying in the Third year

10. Rename table Computer Science to CS

Year	I	Course Code: SEPBCAP1.8	Credits	2
Semester	I	Course Title: Office Automation Lab	Hours	48
Course Pre-requisite, if any		NA		
Formative Assessment Marks: 10		Summative Assessment Marks: 40		Duration of ESA: 03 hrs.
Course Outcomes		At the end of the course, the students should be able to: o Gain Knowledge about Word processor, Spreadsheets and Presentation		

Assignments (To be Implemented using any Open Source Software)
Part A   1. Word Processor assignment to demonstrate usage of Page Setup, Page Background and Paragraph option of Page Layout tab by writing the description about Computer and its characteristics.   2. Word Processor assignment to demonstrate Bullets and Numbering, Headers and footers.   3. Word Processor assignment to demonstrate usage of tables and encryption by preparing the time table.   4. Word Processor assignment to design a pamphlet for the advertisement of your college features by making use of Picture ,ClipArt , Shapes and WordArt options.   5. Word Processor assignment to demonstrate usage of mail merge by creating a letter to invite your parents for the annual day event. Prepare at least 5 letters.   6. Create a power-point presentation with minimum 5 slides and demonstrate the following.   a) Layout option b) Insertion of date, time and slide numbers c) Insertion of Symbols   7. Create a power-point presentation with minimum 5 slides and demonstrate the following. a) Themes   b) Transitions   c) Animation   8. Create a power-point presentation with minimum 5 slides and demonstrate the following. a) Rehearse Timings   b) Narrations   c) Slide Sorter
Part B   1. Spread sheet assignment to create a pay slip to generate salary of employee with the following details.

EMP NO	BASIC	DA	HRA	GROSS	PF	Net Salary

2. Spread sheet Assignment to create SSLC results of 10 students and demonstrate charts. Use the following details SNO, NAME, KAN, HIND, ENG, MAT, SCI, SOC, TOTAL, AVG, MIN, MAX, RESULT, and GRADE.

3. Spread sheet assignment to generate bill and to demonstrate various statistical functions with the following details GRAIN ITEM, UNITS (KG), PRICE, AMOUNT, GRADE.

4. Demonstrate the following in Spread sheet as directed
   a. Create a notepad file as per the following fields:
      Sl.no. name Sub1 Sub2 Sub3 Sub4 Sub5 total % grade
   b. Import this notepad file into Spread sheet using „data from text option.
   c. Calculate total marks obtained and percentage.
   d. Grade is calculated as,
      i. If %>=90, then grade A
      ii. If %>=80 and <90, then grade B
      iii. If %>=70 and <80, then grade C
      iv. If %>=60 and <70, then grade D
      v. If %<60, then grade F

5. Demonstrate various levels of Sorting and Filtering methods of Data by using the following details.
   Slno ItemName Rate Quantity Amount Discount (10%) Final Amount

6. Demonstrate conditional formatting in spread sheet as directed by referring the below example.
   a. Create an attendance spread sheet for minimum 10 students.
   b. Mark P for present and A for absent for respective dates.
   c. Apply formula to calculate "No. of classes attended" and "Attendance Percentage"
      of every student.
   d. Apply conditional formatting to highlight a student if "Attendance Percentage" is less than 75%.

USN	Name	Date 1	Date 2	-	Date N	No. of Classes Attended	Attendance Percentage
123	XYZ	P	A	P	P	3	75%
456	ABC	P	A	A	P	2	50%

7. Demonstrate Data validation in the spread sheet as directed and calculate Net Salary.
a) Create 10 records with following fields.

Emp No	Emp Name	Gen der	Designat ion	DO B	Ag e	Mobile No	PAN NO	Experie nce	Basic Salary	Bon us	Deduct ion	Net Salary

b) Create drop down for Designation column with the values: Manager, Supervisor, Senior Manager.
c) Validate length of Mobile NO and PAN NO.
d) Validate positive values for Experience and Basic Salary.
 e) Calculate Age based on DOB.
d) Calculate Bonus as per the following conditions:
  i. If Experience >=10 years , then Bonus is 10000
 ii. If Experience >=7 years , and < 10 years then Bonus is 7000
iii. If Experience >=4 years, and < 7 years then Bonus is 5000
iv. If Experience >=1 years and <4 years then Bonus is 2500
e) Calculate 5% Deduction on Basic Salary.

Year	I	Course Code: SEPBCAT2.3		Credits	3
Semester	II	Course Title: Data Structures and Algorithms		Hours	48
Course Pre-requisite, if any		Knowledge of C Programming			
Formative Assessment Marks: 20		Summative Assessment Marks: 80		Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course the student should be able to: o Design the algorithm to analyse the problem o Differentiate between iteration and recursion and apply recursive definition for problem solving o Apply various types of searching and sorting techniques on arrays o Evaluate the applications of stacks, queues, linked lists and tree			

Unit No	Course Content	Hours
Unit-1	**Introduction to data structures**: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. **Pointers in C**: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers **Dynamic memory allocation**: Static & Dynamic memory allocation; Memory allocation and de-allocation functions - malloc, calloc, realloc and free.	10
Unit-2	**Recursion**: Definition, Types of recursions, Recursion Technique Examples - GCD, Binomial coefficient nCr, Towers of Hanoi. Comparison between iterative and recursive functions. **File Management in C**: Defining, declaring a file, Opening & Closing File, Input & Output Operations on Files, File error handling functions.	10
Unit-3	**Sorting and Searching:** Representation of linear arrays in memory, Traversing linear arrays; Inserting and deleting elements; **Sorting:** Selection sort, Bubble sort, Quick sort, Merge sort, Insertion sort **Searching:** Sequential Search, Binary search; Iterative and Recursive searching.	10
Unit-4	**Stacks:** Definition and Representation of stacks; Operations on stacks – Push, Pop; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. **Queues:** Definition and Representation of queues; Types of queues - Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues.	9
Unit-5	**Linked list:** Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly linked list, Circular linked list Doubly Circular Linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion;	9

| | **Trees:** Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree. Traversal of binary tree; preorder, in order and post order traversal. | |

Text Books:
1. Ellis Horowitz and SartajSahni: Fundamentals of Data Structures
2. Tanenbaum: Data structures using C (Pearson Education)

References:

1. Y. Kanitkar: Data Structures Using C(BPB)
2. Kottur: Data Structure Using C
3. Padma Reddy: Data Structure Using C

Year	I	Course Code: SEPBCAT2.4	Credits	3
Semester	II	Course Title: Numerical and Statistical Methods	Hours	48
Course Pre-requisite, if any				
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course the student should be able to: o Learn how to obtain numerical solution of nonlinear equations using Bisection, Newton – Raphson and fixed-point iteration methods. o Solve system of linear equations numerically using direct and iterative methods o Develop a framework for estimating and predicting the different sample of data for handling the uncertainties. o Understand the various approaches dealing the data using theory of probability		

Unit No	Course Content	Hours
Unit-1	Introduction and solutions of algebraic and transcendent equations, methods of finding solution of non- linear equations- Bisection method, False Position method, Secant method, Fixed point iteration method and Newton-Raphson method. General discussion on convergence of these methods (No Mathematical derivations)	10
Unit-2	Introduction and methods of solving of solving system of linear equations - Gauss elimination method, Gauss- Jordan, LU Decomposition method and Gauss-Seidal iteration method, Eigen values and Eigen vectors of a square matrix.	10
Unit-3	Origin and development, Definition, Importance and scope of business Statistics, Meaning and definition of data, Methods of data collection. Types of data proportions, ratios and rates; building, cleaning and administering databases in SPSS. Significance of diagrams and graphs, Types of diagrams – one dimensional or Bar Diagrams, Two dimensional or area diagrams, pictograms and cartograms. Graphs of frequency distribution-Histogram, frequency polygon, Frequency curve, gives or cumulative frequency curves.	10
Unit-4	Definition of averages, objectives of averages, requisites of ideal averages. Types of averages- A mean, median, Mode, Harmonic mean, Geometric Mean – Definition computation, merits and demerits,Application in Business. Definition and properties of Ideal Measure of dispersion, Absolute and Relative Measures of dispersion- Range and co-efficient of range, Quartile and co-efficient of Q.D., Average Deviation(AD) and co-efficient of A.D., Standard Deviation and co-efficient of S.D. and co-efficient of variation.	9
Unit-5	Properties of Probability, Equally likely event, mutually exclusive, Independent and Conditional Probability. Types of Probability Distributions - Bernoulli, Binomial, Poisson, fitting a Binomial and Poisson distribution, Normal distribution and problems.	9

Text Books:

1. S.S.Sastri, Introductory Methods of Numerical Analysis, PHI(NewDelhi)2001.
2. Balaguruswamy E, (1988), Computer Oriented Statistical and Numerical Method, Macmillan India Ltd.
3. Medhi J.1992,Statistical Methods (An Introductory Text),New Age International.
4. Business Statistics by-J K Sharma, Pearson Publication.

References:

1. M.K.Jain, S.R.K.Iyenger and R.K.Jain, Numerical Method for Scientific and Engineering Computation, Wiley Eastern (1998).
2. V.RajaRaman Computer oriented numerical methods, PHI Publication
3. Gupta S.C. and Kapoor V.K. 2005 Fundamentals of Mathematical Statistics, S.Chand and Sons, New Delhi.
4. Gupta S.C. and Kapoor V.K.2005 Fundamentals of Applied Statistics, S.Chand and Sons, New Delhi.

Year	I	Course Code: SEPBCAT2.5	Credits	3
Semester	II	Course Title: OOPS Using Java	Hours	48
Course Pre-requisite, if any				
Formative Assessment Marks: 20		Summative Assessment Marks: 80	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course the student should be able to: o Understand the features of Java and different tools available in Java Environment. o Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done. o Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance o Demonstrate programs based on arrays and strings. o Demonstrate programs based on interfaces and threads. o Explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Languages.		

Unit No	Course Content	Hours
Unit-1	Concept - Object, classes, abstraction, encapsulation, inheritance, polymorphism .History of Java, features of Java, Java Environment - JDK, API, Java Runtime environment, JVM, Java program structure, Identifiers and Keywords, Data types and typecasting, Variables, operators, Java coding conventions, Expressions, Control structures, Decision making statements, Arrays and its methods, command line arguments.	10
Unit-2	Java classes, Define class with instance variables and methods, Object creation, Accessing member of class, argument passing, Constructors, Method overloading, constructor overloading, Static data, Static methods, Static blocks, This keyword, Garbage collection & finalize() method, Arrays.	10
Unit-3	String –String Class, String Buffer Class, Inheritance: super class & subclass, types of inheritance, super keyword, method overriding, abstract method and classes, final keyword, dynamic method dispatch.	9
Unit-4	Interfaces: Defining interfaces, Implementing interfaces, accessing interface variables; Packages: Java API Packages, Using System Packages, Creating packages, Accessing a package, Importing classes Modifiers & access control (Default, public, private and protected) Exception handling: Types of Exceptions, try, catch, finally, throw, throws keywords, creating your own exception, multiple catch statements.	10
Unit-5	Java Input Output: Java IO package, File Class, Byte/Character Stream, Buffered reader / writer, File reader / writer; Multithreading: Multithreading concept, Java thread model, Main thread, Creating a thread, Creating multiple threads, thread priorities.	9

Year	I	Course Code: SEPBCAP2.6	Credits	2
Semester	II	Course Title: Data Structures Lab	Hours	48
Course Pre-requisite, if any				
Formative Assessment Marks: 10		Summative Assessment Marks: 40	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course the student should be able to: o Design the algorithm to analyse the problem o Differentiate between iteration and recursion and apply recursive definition for problem solving o Apply various types of searching and sorting techniques on arrays o Evaluate the applications of stacks, queues, linked lists and tree		

Lab Assignments

Part A:
1. Program to implement dynamic array, find smallest and largest element of the array.
2. Program to find GCD using recursive function
3. Program to generate binomial coefficient using recursive function.
4. Program to generate n Fibonacci numbers using recursive function.
5. Program to implement Towers of Hanoi using recursion.
6. Write a program that takes a file as an argument and counts the total number of lines. Lines are defined as ending with a newline character.
7. Program to search an element using linear search technique.
8. Program to search an element using binary search technique.
9. Program to create a text file and count the characters present in it.
10. Program to copy the contents of one text file to another text file.

Part B:
1. Program to sort the given list using selection sort technique.
2. Program to sort the given list using bubble sort technique.
3. Program to sort the given list using insertion sort technique.
4. Program to sort the given list using quick sort technique.
5. Program to sort the given list using merge sort technique.
6. Program to implement Stack.
7. Program to convert an infix expression to postfix.
8. Program to implement simple queue.
9. Program to implement linear linked list.
10. Program to implement a binary tree and traverse in pre-order

Year	I	Course Code: SEPBCAP2.7	Credits	2
Semester	II	Course Title: Numerical and Statistical Methods Lab	Hours	48
Course Pre-requisite, if any		NA		
Formative Assessment Marks: 10		Summative Assessment Marks: 40	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course the student should be able to: o Learn how to obtain numerical solution of nonlinear equations using Bisection, Newton – Raphson and fixed-point iteration methods. o Solve system of linear equations numerically using direct and iterative methods o Develop a framework for estimating and predicting the different sample of data for handling the uncertainties. o Understand the various approaches dealing the data using theory of probability		

Lab Assignments
(Part A must be implemented using C Language and Part B using SPSS)

Part A

1. Write a program to check whether the given matrix is singular or not.
2. Write a program to find roots of an equation f(x)=0 using Bisection method.
3. Write a program to find roots of an equation f(x)=0 using Regula-Falsi method.
4. Write a program to find roots of an equation f(x)=0 using Newton-Rephson method.
5. Write a program to solve the system equation Ax=b using Gauss Elimination method.
6. Write a program to solve the system of equation Ax=b using Gauss Seidel method.

Part B:

1. Open a new dataset in SPSS
- Create a nominal variable called cat_dog that has a width of 3 with 0 decimal places. The label should be "Do you like cats or dogs better?" The values should be 1 for cats and 2 for dogs (or vice-versa). Do not worry about missing data codes.
- Create a scale variable called neatness that has a width of 8 with 3 decimal places. The label should be "Eric Cartman's Neatness Scale(higher=neater)". There will be no value labels.
- Enter data for the following cases
  - Case 1 prefers cats and has a neatness of 4
  - Case 2 prefers dogs and has a neatness of 3
  - Case 3 prefers dogs and has a neatness of 7
  - Case 4 prefers dogs and has a neatness of 2
  - Case 5 prefers cats and has a neatness of 5
  - Case 6 prefers cats and has a neatness of 1
  - Case 7 prefers cats and has a neatness of 3
  - Case 8 prefers dogs and has a neatness of 6
- Change the neatness of the second case from 3 to 6, like you would if you discovered a data entry error.

2. Create a dataset in *SPSS* for the following data:

Group	Gender	Hw1	Hw2	Hw3
expt	Male	92	84	93
expt	Female	77	84	85
expt	Male	87	86	81
expt	Female	89	90	93
expt	Male	64	73	78
control	Female	81	84	93
control	Male	83	90	91
control	Female	84	88	86
control	Male	82	80	78
control	Female	96	91	88

- Using the Frequencies option, find the mean, median, mode, quartiles, 95th percentile, variance, standard deviation, minimum, and maximum of Hw1, Hw2, and Hw3.
- Using the Descriptive option, find the means and standard deviations of Hw1,Hw2 and Hw3.
- Using the Compare Means - Means procedure, find the mean son Hw1,Hw2 and Hw3 for everyone for the experimental group, for the control group, for men, for women, and for all combinations of gender and group.

3. A researcher has created a data table showing the anthropometrical measurements of tribal subjects under each of the four social categories, namely GM, OBC, SC and ST as shown in table.

GM			
Gender	HT	WT	Biceps
1	137.8	30.5	5.50
2	130.2	29.5	5.65
2	135.6	29.0	5.15
2	137.8	30.0	5.25
1	131.5	30.5	4.95
1	132.8	31.5	5.65
1	139.8	30.5	5.50
1	136.7	30.0	5.65
1	138.6	30.5	5.15
1	139.5	30.5	5.25

SC			
Gender	HT	WT	Biceps
2	132.4	25.0	4.37
1	133.5	24.5	4.95
1	130.6	25.5	4.65
1	132.5	26.5	4.45
1	130.6	26.0	6.48
2	132.4	25.5	5.01
1	130.5	25.0	4.37
1	132.4	24.5	4.95
2	133.5	25.5	4.65
2	130.6	26.5	4.45

OBC			
Gender	HT	WT	Biceps
1	124.4	23.5	4.61
2	125.5	23.0	4.52
1	126.3	24.0	4.45
2	128.0	23.5	4.39
1	129.0	25.0	4.37
2	130.0	22.0	4.69
1	129.5	23.5	4.61
1	130.0	23.0	4.52
2	126.0	24.0	4.45
2	128.5	23.5	4.39

ST			
Gender	HT	WT	Biceps
1	124.5	20.5	3.54
1	125.8	21.0	3.55
1	123.5	20.5	3.95
1	124.8	22.0	4.05
1	122.5	21.5	3.55
1	122.8	22.0	3.54
1	122.5	22.5	3.55
1	121.5	21.5	3.95
1	124.5	20.5	4.05
2	125.8	21.0	3.55

- Create a data file in *SPSS* (The Data in *SPSS* has to be entered with category1=GM,2=OBC,3=SC and 4=ST. The codes for Gender are 1=Male and 2=

Female).
- Generate central tendency and measures of dispersion output using the descriptives command in SPSS for the variables Height, Weight and Biceps.
- Generate two-way cross table Gender versus Category.

4. The marks obtained by 50 students of a class in mathematics are given below.

32,42,41,51,41,30,39,18,48,53,54,32,31,46,15,37,32,56,42,48,38,26,50,40,38,42,35,22,62,51,44, 21,45,31,37,41,44,18,37,47,38,41,30,52,52,60,42,38,38,34.
- Create a data file in SPSS.
- Generate a frequency table.
- Draw the Histogram.
- Generate central tendency output using the frequencies command in SPSS.
- Generate central tendency output using the descriptives command in SPSS.
- Generate central tendency output using the explore command in SPSS.

5. The number of blood donations in the years 1995 and 2000 in various blood groups are as follows

Year	O	A	B	AB
1995	1154	526	775	155
2000	700	1125	1280	560

Create a data file in SPSS and hence represent the data by multiple bar diagram.

6. Fitting the Binomial & Poisson probability distribution for the following data using SPSS

X	0	1	2	3
F	36	40	22	2

Year	I	Course Code: SEPBCAP2.8	Credits	2
Semester	II	Course Title: Object Oriented Programming using Java - Lab	Hours	48
Course Pre-requisite, if any		Programming Language concepts		
Formative Assessment Marks: 10		Summative Assessment Marks: 40	Duration of ESA: 03 hrs.	
Course Outcomes		At the end of the course, the students should be able to: ○ Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done. ○ Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance ○ Demonstrate programs based on arrays and strings. ○ Demonstrate programs based on interfaces and threads, exception handling.		

Lab Assignments(to be implemented using Netbeans/eclipse or any other Open Source IDE)
Part A: 1. Program to demonstrate relational operators in Java. 2. Program to display largest of 3 numbers by assigning values to variables. 3. Write a Java program to calculate area and circumference of circle. Accept radius using command line arguments. 4. Program to perform arithmetic operations using switch case statement. 5. Program to display factorial of numbers from 1 to 10. 6. Program to sort numbers stored in an array. 7. Program to define a class Rectangle with data members length, breadth and member functions to calculate area and perimeter. 8. Program to demonstrate constructor overloading concept. 9. Program to demonstrate method overloading. 10. Program to demonstrate static variables and methods. **Part B:** 1. Program to demonstrate single inheritance. 2. Write a Java Program to implement inheritance and demonstrate use of method overriding. 3. Program to demonstrate multilevel inheritance. Show the usage of super(). 4. Write a program to demonstrate use of user defined package by importing the package and access the members of classes contained in the package. 5. Write a java program to demonstrate at least 5 methods of String class. 6. Write a java program to demonstrate the methods of StringBuffer class. 7. Write a program to demonstrate use of implementing interfaces. 8. Write a java program to implement exception handling using multiple catch statements. Also include code to identify the significance of finally block in handling exceptions. 9. Illustrate creation of thread by extending Thread class. 10. Illustrate creation of thread by implementing Runnable interface.

Scheme of Evaluation
Semester End Exam Question Paper Pattern

Duration of the examination: 3hour   Max. Marks: 80

Section A
Answer any TEN Questions from the following, each carries 2 marks: [10X2=20]

1.   --------------------------------------
2.   --------------------------------------
3.   --------------------------------------
4.   --------------------------------------
5.   --------------------------------------
6.   --------------------------------------
7.   --------------------------------------
8.   --------------------------------------
9.   --------------------------------------
10.   --------------------------------------
11.   --------------------------------------
12.   --------------------------------------

Section B
Answer any FOUR from the following questions each carries 5 marks.   [4X5=20]

13.   --------------------------------------
14.   --------------------------------------
15.   --------------------------------------
16.   --------------------------------------
17.   --------------------------------------

Section C
Answer any FOUR from the following questions each carries 10 marks.   [4X10=40]
(The Question may consists two sub-questions)
18.   --------------------------------------
19.   --------------------------------------
20.   --------------------------------------
21.   --------------------------------------
22.   --------------------------------------

CIA for Practical	
Assessment Type	Marks
Test1	10
Total	10 Marks

Semester End Examination Scheme of Evaluation for Lab Examination

Assessment Criteria	Marks
Writing of 2 Programs (Each from Part A & Part B)	15
Execution (Includes program code modification and execution result)	15
Journal	05
Viva Voice	05
Total	40 Marks

Instructions:
1. Certified Journal is mandatory for appearing in the Lab examination.
2. Students shall be given two programming assignments taking into consideration the duration of the time allotted to students for writing, typing and executing the programs.

CIA for Theory	
Assessment Type	Marks
Test 1 / Seminar / Activity	10
Test 2 / Seminar / Activity	10
Total	20 Marks

Note: Guidelines given by the university from time-to-time shall be followed for IA.