

ST. ALOYSIUS' COLLEGE (AUTONOMOUS)

JABALPUR (M. P.), INDIA

Reaccredited 'A+' by NAAC with CGPA (3.68/4.0)

College with Potential for Excellence by UGC

DST-FIST supported

BACHELOR IN COMPUTER APPLICATION (BCA)

PROGRAM OUTCOME: Bachelor in Computer Applications is an undergraduate programme to start career in applications in IT firm. It helps the students to understand the concepts of key areas in Computer Science. It provides sound academic base to analyze and apply latest technologies to solve problems in the areas of computer applications. It also provides analysis and synthesis involved to develop practical skills to provide solutions to industry, society and business. To develop skilled manpower in the various areas of information technology like: Database management, Software Development, Computer-Languages, Software engineering, Web based applications etc.

PROGRAM SPECIFIC OUTCOME: After completion of Bachelor in Computer Application students will be able to work in IT industries, various public and private sectors etc. They will be able to work on different profiles like web developer, UI designers, testers, coders, SEO developers etc.

SCHEME**BCA – II/ Second Year (Annual System)**

Group	Paper Code	Subject	Internal			Theory	Total	Practical	Grand Total
			3 Months	6 Months	Total				
Group I	BCA-21	Data Structures using C++	5	5	10	40	50	--	100
	BCA-22	Database Management System	5	5	10	40	50	--	
Group II	BCA-23	Internet of Things and Python Programming	5	5	10	40	50	--	100
	BCA-24	Operating System with UNIX /LINUX	5	5	10	40	50	--	
Group	BCA-25	Accounting and Financial	5	5	10	40	50	--	

III		Management							100
	BCA-26	Computer Oriented Numerical Methods	5	5	10	40	50	--	
Group IV	BCA-27	Foundation Course -Same as B.Sc./B. Com./B. A.					100	--	100
Group V	BCA-P28	Practical based on BCA21, BCA22, BCA23 & BCA24	--	--	--	--	--	50	50
	TOTAL						400	50	450

NOTE: General BCA Examination rules are same as B.Sc. (Computer Sc.)/(IT).

In each group student is required to obtain minimum 27 marks in theory and 7 marks in internal assessment to pass.

Pattern of Question papers shall be as given below:

There will be three sections in each paper. All questions from each section will be compulsory.

Section A(5=5*1): this section will contain 5 objective type questions. One question from each unit of one mark.

Section B(10=2*5): 5 questions from each unit of 2 marks each with internal choice.

Section C(25=5*5):5 questions from each unit of 5 marks with internal choice.

ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA II YEAR

PAPER-I DATA STRUCTURES USING C++

Maximum Marks:40

Minimum Marks:14

Course Objective: The paper comprise of programming perception of C++ and the concept of data structure. The basic objective of programming in C++ is to develop a greater understanding of functional, logic, and object-oriented programming paradigms in programming language design and also understanding the design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. The objective of Data Structure is to introduce the concepts of Abstract data Type, performance measurement, time and space complexities of algorithms, to discuss the implementation of linear data structures such as stacks, queues and lists and their applications, non-linear data structures such as trees and graphs, and various sorting and searching techniques.

Course Outcome: Understand the use of object-oriented concepts to implement object oriented programs in C++ with applications to encapsulation, inheritance and polymorphism and develop knowledge of basic data structures for storage and retrieval of ordered or unordered data. Data structures include: arrays, linked lists, binary trees, heaps, and hash tables. Students will develop the knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, searching, and sorting of each data structure.

UNIT-I

Introduction to OOP'S languages, characteristics of OOP's languages, application of OOP's, OOP's paradigm, concepts: object, class, data abstraction, data encapsulation, inheritance and polymorphism. Static and dynamic binding, message passing, benefits of OOP's, disadvantage of OOP's.

UNIT-II

C++ Programming Concepts: input and output in C++, functions in C++- value parameters, reference parameters, Parameter passing, function overloading, arrays, pointers, new and delete operators, class and object, access specifiers, friend functions, constructors and destructors, Operator overloading, Inheritance and Polymorphism.

UNIT-III

Basic Concepts – Data Structures, Algorithm Specification-Introduction, Recursive algorithms, Data Abstraction, Performance analysis- time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations, Complexity Analysis Examples, Introduction to Linear and Non Linear data.

Stack: Definition, Array implementation of stack (static stack): Operations PUSH, POP, And TRAVERSE. Applications of stack: Infix, Prefix, Postfix. **Queue:** Definition, Array implementation of queue (static queue): Operations INSERT, DELETE and TRAVERSE. Introduction to Circular queue: Definition & implementation, Priority queue, Double ended queue, Applications of queue.

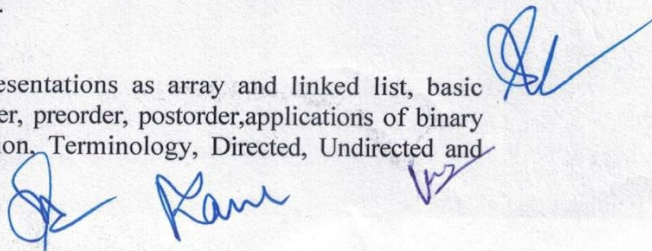
UNIT-IV

Introduction to linked list: Definition, advantaged, basic operations on linked list, stacks and queues using linked list, doubly linked list, circular linked list, applications of linked list.

Searching and Sorting Techniques: Sequential search, binary search, insertion sort, selection sort, quicksort, bubblesort, heapsort, comparison of sorting methods.

UNIT-V

Tree: Trees-basic terminology, binary trees, tree representations as array and linked list, basic operations on binary tree, traversal of binary trees:- inorder, preorder, postorder, applications of binary tree, Threaded binary tree, AVL tree. **Graphs:** Definition, Terminology, Directed, Undirected and



Weighted Graph, Representation of Graph, Graph Traversal-Depth first, Breadth first search, Spanning tree, Minimum Spanning tree, Shortest path algorithm.

TEXT BOOKS

1. Object Oriented Programming with C++, Balaguruswamy, Tata McGraw Hill(2008).
2. Object Oriented Programming in C++, Robert Lafore, Sams; 4th edition.
3. YedidyahLangsam Moshe J. Augenstein, Aaron M. Tenenbaum, "Data Structures using C & C++", PHI
4. G.S.Baluja, "Data Structures Through C++", Dhanpat Rai & Co., 4th Edition
5. Fundamentals of Data Structures by Sartaj Sahani.

Reference Books

1. Seymour Lipschutz, "Data Structures", Schaum's Outline Series, Tata McGraw Hill.
2. Adam Drozdok, "Data Structures & Algorithm in C++", 2nd Edition

List of Practical

1. Display int, float, char and string using cin and cout.
2. Program to add two numbers.
3. Program to check eligibility to admission.
4. Program to check whether entered number is even or odd.
5. Program to check percentage and grade of a student.
6. Program to print days of week.
7. Program to calculate sum of digits of entered number.
8. Program to check that given number is palindrome or not.
9. Program to calculate area of rectangle, triangle and sphere using function overloading.
10. Program to access private members of a class using member function.
11. Program to implement multiple inheritance.
12. Program to implement multiple inheritance.
13. Program to read values using constructors.
14. Program to declare default argument in constructor to obtain power of a number.
15. Program to implement multiple virtual base class.
16. Program to declare pure virtual function.
17. Implementation of stack using array.
18. Implementation of queue using array.
19. Insertion, deletion and traversal of singly linked list.
20. Insertion, deletion and traversal of doubly linked list.
21. Program for linear and binary search.
22. Sorting: selection, bubble, insertion and quicksort.

Handwritten signature

Handwritten signature

Handwritten signature

ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA II YEAR

PAPER-II DATABASE MANAGEMENT SYSTEM

Maximum Marks:40

Minimum Marks:14

Course Objective: To give knowledge of the Relational Model of Data Management. This course contains approaches to organize, store, retrieve and process data, architecture and design techniques for effective implementation, different anomalies and their solutions and a platform for understanding of SQL and PL/SQL.

Course Outcome: Student will be able learn database creation and modification. Data definition, manipulation, control using SQL command. They will learn the concepts of joining the database which will help them access data from different relations. Students will be able to implement the programming using PL/SQL for automated and fast database activities.

UNIT-I

Purpose of database system, views of data, data models: relation, network, hierarchical, instances and schemas, data dictionary, types of database languages, structure of DBMS, advantages and disadvantages of DBMS, 3-level architecture proposal: external, conceptual & internal levels, levels of data abstraction, Database users and DBA, Classification of Database Management Systems, Components of database system, Traditional File Systems vs. Modern Database Systems, Applications of DBMS, Data Independence.

UNIT-II

Entity relationship model as a tool of conceptual design: entities & entities set, relationship, relationship set & relationship types, attributes, role, participation and mapping constraints, keys, strong and weak entities, Advance ER Model Features: generalization, specialization & aggregation. **Fundamentals of set theoretical notations:** relations, domains, attributes, tuples.

UNIT-III

Concept of keys: primary key, super key, alternate key, candidate key, foreign key. **Fundamentals of integrity rules:** Entity & referential integrity, extension and intention. **Relational Algebra:** select, project, Cartesian product, types of joins: theta, equi, natural, outer joins, Set Operations. **Relational Calculus:** Tuple Relational Calculus, Domain Relational Calculus, Codd's Rule.

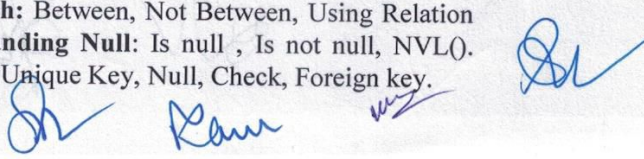
UNIT-IV

Functional Dependencies, Good & Bad Decomposition and Anomalies as a database: A consequences of bad design, Universal relation, Normalization: 1NF, 2NF, 3NF & BCNF normal forms, multivalued dependency, join dependency, 4NF, 5NF.

SQL Statement: DDL, DML, DCL, TCL. **Character Function:** Upper, Lower, Initcap, Lpad, Rpad, Ltrim, Rtrim, Substr, instr, concat. **Number Function:** Ceil, Floor, Round, Trunc, Power, Sign, Abs, Mod. **Date Function:** Sysdate, Months_between, add_months, Last_day, Next_date.

UNIT-V

Group function: Min, Max, Avg, Count, Sum. **Conversion Function:** To_char, to_date, To_number. **Sorting Data:** Order by (Ascending and Descending). **Filter Data:** Where Clause. **Pattern Matching:** Like, Not Like. **Range Search:** Between, Not Between, Using Relation Operator. **Sub Query:** Single Row and Multi Row. **Handling Null:** Is null, Is not null, NVL(). Group by and Having Clause. **Constraints:** Primary Key, Unique Key, Null, Check, Foreign key.



PL/SQL: Program Structure, Oracle Data types, Named Block, Looping and Decision Making, Unnamed Block, Stored Function, Stored Procedure, Cursor, Packages, Trigger, and Exception Handling.

Text Books

1. Database System Concepts by Henry Korth and A. Silberschatz.
2. Simplified approach to DBMS, Prateek Bhatia, Gurvinder Singh Kalyani Publication
3. Database Management System by Seema Kedar, Technical Publication

Reference Books

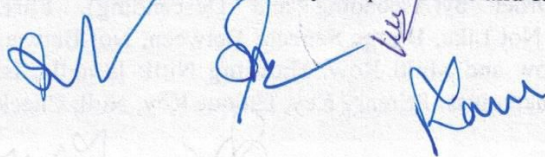
1. An Introduction to Database System by Bipin Desai
2. An Introduction to Database System by C.J. Date.
3. Atul Kahate, "Introduction to Database Management Systems",
4. Raghu Ramakrishnan, "Database Management Systems",
- G.K. Gupta, "Database Management Systems", Tata McGraw Hill, 2011.

SQL:

1. Create table employee with column id, name, dob, designation, salary. Insert 10 rows.
2. Create table salesman with fields: num, name, city, commission. Insert into 10 rows.
3. Create table customer with field: num, name, city, rating, num. Insert 5 rows.
4. Update data commission 500 rs if rate is less 5.
5. Change the table structure employee, add new column address, drop column designation and add column post. Rename the column commission to comm of table salesman.
6. Display the name of following student a) Started with 'A'. b) Ended by 'S' c) name contains word 'F' except start and end. d) Second letter is 'E';
7. Display the name of following student: a) Commission is between 500 to 3000 b) Salary is less than 5000.
- c) Date of birth is greater than 10-May-1991. d) Salary is greater than 5000 d) rating is 10 e) 10 % of salary.
8. Display the name of following student: a) Name is ascending order and descending b) name of employees from the same city c) name of employees from the same city having average salary 10000.
9. Perform group function: sum, count, min, max, avg.
10. Perform date function: sysdate, add_months, months_between, last_day(), Next_day()
11. Perform Set operation: Union, Minus, Intersect.
12. Add primary key, unique key, check constraints, null constraints in employee.
13. String: Character, CHR, concat, initcap, length, lower, upper, lpad, rpad, Rtrim, ltrim, substr, '
14. Number: abs, ceil, floor, round, sign, trunc, power, sqrt,

PL/SQL

1. Write unnamed program block to add two numbers.
2. Write a stored procedure to compare three numbers and display the largest number.
3. Write a function to check whether the given number is prime or not.
4. Write a procedure to implement case statement. Create a calculator, which will perform Five operation: Addition, Subtraction, Multiplication, Division and Implement Zero_Divide exception.
5. Write procedure to print odd numbers between 1 to 100 using for loop.
6. Write a procedure named as cursor_testing. Create a cursor named with First_cursor fetch and display all the data from emp table. Implement too_many_rows and no_data_found exception.
7. Write trigger to restrict delete and insert operation on EMP table.
8. Write procedure to print Fibonacci series using and implement user defined exception.
9. Create a package Student_Name_library and put all your procedure and function into package.

The block contains three handwritten signatures in blue ink. The first signature on the left is a stylized cursive name. The middle signature is also cursive and appears to be 'Ravi'. The third signature on the right is written in a more blocky, capital-letter style and reads 'Ravi'.

ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA – II YEAR

PAPER-III INTERNET OF THINGS AND PYTHON PROGRAMMING

Maximum Marks:40

Minimum Marks:14

Course objective: The course is designed to acquire basic programming and object-oriented skills in python. Also the course is intended to familiarize students with *Arduino as IDE, programming language & platform* and focusing to make them understand product design and prototyping in Internet of Things.

Course outcome: After the completion of the course, the students will be able to design Smart System applications using *Arduinobboards* and *basic* components. The students will also be able to solve real life problems using various libraries of Python.

UNIT-I

Introduction, types of Arduino, Explore Arduino IDE: File(New, Open, Open Recent, Examples, Close, Save, Save as, Page Setup, Print, Preference), Edit(Undo, Redo, Cut, Copy, Paste, Select All, Find), Sketch(Verify/Compile, Upload, Show Sketch Folder, Include Library), Tools (Auto Format, Archive Sketch, Fix Encoding and Reload, Serial Monitor, Serial Plotter, Board, Port, Get Board Info).

UNIT-II

Variables, Data types, collecting and showing data through serial port, Strings and operations with strings, Operators and loops, Exploring Arduino Uno: USB port, External power jack, Analog pins, Digital pins, ICSP (In Circuit Serial Programming), Microcontroller, reset button, Connecting Arduino to PC. Main functions: setup () function, loop () function. Installing package.

UNIT-III

What is Python, Python Features, Python Applications, Python and PyCharm Installation, Python IDE, Python Code Basics- Python Variables, Python Data Types (Lists, Tuples, Sets, Dictionary, Strings, Numeric), Python Operators, Python Conditional Statements (If Statement, Elif Statement, Else Statement, Python Loops (While Loop, For Loop, Nested Loop), I/O Operations.

UNIT-IV

Python Functions, Uses of Functions, File Handling (Open File, Read / Write File, Close File), Object and class (defining a class, creating an object), _init_(), object methods, selfparameter.

UNIT-V

Python NumPy- array(one, multi-dimensional), NumPy array vs list, NumPy operations (ndim, iemsize, dtype, reshape, slicing, linspace, max/min, addition, vertical and horizontal stacking, ravel). Python Matplotlib, types of plot, Python Pandas, Pandas Operations: (Slicing the data frame, Merging & Joining, Concatenation, Changing the index, Change Column headers, Datamungin

Text Books:

- Learning C for Arduino by Syed Omar FarukTowaha.
- Learning Python by Mark Lutz,O'Reilly Publication, 5thEdition
- Python Programmin for beginners by Jason Cannon, Createspace Independent Publishing platform,2014

List ofpractical

Arduino

1. Write a program to Blink LED using ArduinoIDE.
2. Write a program to take input from button (Micro-switch) using ArduinoIDE.
3. Write a program to take Analog input from DHT sensor using ArduinoIDE.

Handwritten signatures and initials in blue ink.

4. Write a program to demonstrate switch-case with the IR sensor using Arduino IDE.
5. Write a program to display Text on LCD (16*2) Display using Arduino IDE.

Python

1. Write a program which will find factors of given number and find whether the factor is even or odd. Hint: Use Loop with if-else statements
2. Write a code which accepts a sequence of words as input and prints the words in a sequence after sorting them alphabetically. Hint: In case of input data being supplied to the question, it should be assumed to be a console input.
3. Write a program, which will find all the numbers between 1000 and 3000 (both included) such that each digit of a number is an even number. The numbers obtained should be printed in a comma separated sequence on a single line. Hint: In case of input data being supplied to the question, it should be assumed to be a console input. Divide each digit with 2 and verify if it is even or not.
4. Write a program that accepts a sentence and calculate the number of letters and digits. Suppose if the entered string is: Python0325 Then the output will be: LETTERS: 6 DIGITS: 4. Hint: Use built-in functions of string.
5. Design a code which will find the given number is Palindrome number or not. Hint: Use built-in functions of string.
6. A website requires a user to input username and password to register. Write a program to check the validity of password given by user. Following are the criteria for checking password:
 1. At least 1 letter between [a-z]
 2. At least 1 number between [0-9]
 3. At least 1 letter between [A-Z]
 4. At least 1 character from [\$#@]
 5. Minimum length of transaction password: 6
 6. Maximum length of transaction password: 12
7. Write a for loop that prints all elements of a list and their position in the list. a = [4, 7, 3, 2, 5, 9]
8. Please write a program which accepts a string from console and print it in reverse order.
9. Please write a program which counts and prints the numbers of each character in a string input by console.
10. With two given lists [1, 3, 6, 78, 35, 55] and [12, 24, 35, 24, 88, 120, 155], write a program to make a list whose elements are intersection of the above given lists.
11. By using list comprehension, please write a program to print the list after removing the value 24 in [12, 24, 35, 24, 88, 120, 155].
12. By using list comprehension, please write a program to print the list after removing the 0th, 4th, 5th numbers in [12, 24, 35, 70, 88, 120, 155].
13. By using list comprehension, please write a program to print the list after removing delete numbers which are divisible by 5 and 7 in
14. Write a program to compute $1/2 + 2/3 + 3/4 + \dots + n/n+1$ with a given n input by console (n > 0).
15. Use Case

Domain – Telecom focus –
Optimization

Business challenge/requirement

LifeTel Telecom is the latest entrant in the highly competitive Telecom market of Singapore. It issues SIM to the verified users. Till now verification was manual through the photocopy of approved id card document. However, government has recently introduced Social ID called Reference ID which is mapped to fingerprint of user. LifeTel should now verify user against the fingerprint and Reference ID

Key issues Build a system where when user enters Reference ID it is encrypted, so that hackers cannot view the mapping of Reference ID and finger print

Business benefits

Company will be able to quickly issue SIM to user and expected gain in volume is approximately 10 times as the manual process of verification is replaced with secure automated system

Approach to Solve

You have to use fundamentals of Python taught in module 1 1.Read the input from command line –Reference ID

2.Check for validity –it should be 12 digits and allows on number and alphabet 3.Encrypt the Reference ID and print it forreference

Enhancements for code

1.Allow some special characters in Reference ID 2.Give the option for decryption to user

WZ
Kane
SV

1/2
WZ Kane SV

ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA II YEAR

PAPER-IV OPERATING SYSTEM with UNIX/LINUX

Maximum Marks:40

Minimum Marks:14

Course Objective: The course is intended as a general introduction to the techniques used to implement operating systems and related kinds of systems software. To familiarize with main structure of Operating System and their working and understand the operations performed by Operating System. The objective is to learn the different memory management techniques and various scheduling policies of Operating system.

Course Outcome: Students will learn various concepts and features of Operating systems and will be able to compare various operating systems. Students will learn algorithm of CPU Scheduling, Memory Scheduling and diskscheduling.

Unit I

Introduction to Operating Systems, Operating System Services, Functions of Operating System, Types of Operating System, Multiprogramming, Time-sharing system, Storage Structures, System Calls, Multiprocessor System. Basic Concepts of CPU Scheduling, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation, Multiple Processor Scheduling, Real-time Scheduling, I/O devices organization, I/O buffering.

Unit II

Process Concept, Process Scheduling, Operations on Processes, Threads, Inter-Process Communication, Precedence Graphs, Critical Section Problem, Semaphores, Classical Problems of Synchronization. Deadlock: Deadlock Problem, Deadlock characterization, Deadlock prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock, Methods for Deadlock Handling.

Unit III

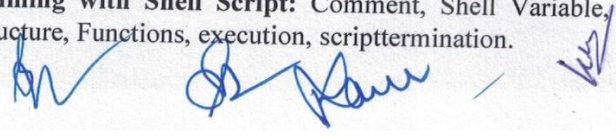
Concepts of Memory Management, Logical and Physical Address Space, Swapping, Memory Allocation Techniques: Contiguous and Non-contiguous Allocation, Paging, Fragmentation, Segmentation, Segmentation Architecture, Concepts of Virtual Memory, Demand Paging, Page Replacement Algorithms: FIFO, OPR, LRU, Thrashing, Directory Structure, Free Space Management, Disk Scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK.

Unit IV

Linux Operating System, Philosophy, File System, Types of File, Structure of file system, shell layers, Linux Commands: General Purpose Utilities: banner, cal, date, echo, printf, passwd, who, tty, stty, File System Commands: pwd, cd, mkdir, rmdir, ls, Handling Ordinary File Commands: cat, cp, rm, mv, more, file, wc, cmp, comm, diff, lp commands. Pattern Matching, pipes, tee, Simple Filters: head, tail, cut, paste, sort, join, grep, vi editor.

Unit V

The Process: The Shell Process: Parents and Children, wait, ps: Process Status, System Processes, Running Multiple Jobs: Foreground and Background, nice: Job Execution with Low Priority, kill: Premature Termination of Process, Job Control, cron: Running Jobs Periodically, time: Timing Processes set and shift statement, **Programming with Shell Script:** Comment, Shell Variable, Operators, Arithmetic Expansion, Control Structure, Functions, execution, script termination.



Practical Note: As per the syllabus and under guidance of respective faculty every student has to perform minimum 25 lab. exercise covering all units with equal weightage.

TEXT BOOK:

1. Operating System Concepts, Addison Wesley, 4th Edition, A. Silberschatz and P. Galvin.1994.
2. Sumitabha Das, "Unix : Concepts and Applications", Third Edition, 2006, Tata Mc-GrawHill
3. Modern Operating System, A.S Tanenbaum., Prentice Hall of India
4. Operating System by Deitel

REFERENCE BOOK:

1. Maurice J. Bach, "Design of the Unix Operating System", Third Edition, 2000, PHI.
2. ISRD Group, Basics of OS, UNIX and SHELL Programming" TMH(2006)
3. A User guide to unix system", Thomas Rebecca yate, Second Edition, 2002., Tata McGrawHill.
4. Stephen Prata "Advanced Unix -A programmer's Guide.

LIST OF PRACTICAL

- [1] Write a shell script program to display "HELLOWORLD".
- [2] Write a shell Script program to check whether the given number is even or odd.
- [3] Shell script to create a simple calculator that performs basic arithmetic operations.
- [4] Calculate area of circle.
- [5] Calculate Simple Interest.
- [6] Copy contents from one file to another file.
- [7] Find greatest number among three numbers.
- [8] Print reverse of an input number.
- [9] Enter marks and basic information of student and print marksheet.
- [10] Print list of prime number between a range entered by user.

Handwritten signatures and initials are present in the bottom right corner of the page, including a large signature that appears to read "Kaur" and several smaller initials.

ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA – II YEAR

PAPER-V ACCOUNTING AND FINANCIAL MANAGEMENT

Maximum Marks:40

Minimum Marks:14

Course Objective: This course will expose students to a broad range of accounting concepts and their terminology. This will prepare the learners for a mix of accounting professional activities including public accounting, governmental accounting and corporate accounting and will make aware with the financial statements in accordance with the accepted accounting principles.

Course Outcome: This course will impart knowledge and understanding of the principle and concepts of financial accounting and develop the skill required for the preparation of financial statement and accounts of various business and companies.

UNIT-I

Introduction: Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping Terms used in accounting, users of accounting information and limitations of Financial Accounting.

UNIT-II

Conceptual Frame work: Accounting Concepts, Principles and Conventions, Accounting Standards concept, objectives, benefits, brief review of Accounting Standards in India, Accounting Policies, Accounting as a measurement discipline, valuation Principles, accounting estimates.

UNIT-III

Recording of transactions: Voucher system; Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance. Depreciation: Meaning, need & importance of depreciation, methods of charging depreciation.(WDV &SLM).

UNIT-IV

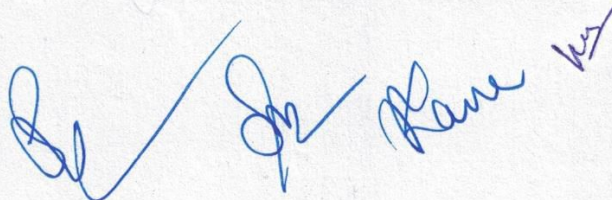
Preparation of final accounts: Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietary business. Introduction to Company Final Accounts: Important provisions of Companies Act, 1956 in respect of preparation of Final Accounts. Understanding of final accounts of a Company.

UNIT-V

Computerised Accounting: Computers and Financial application, Accounting Software packages. An overview of computerized accounting system - Salient features and significance, Concept of grouping of accounts, Codification of accounts, Maintaining the hierarchy of ledger, Generating Accounting Reports.

Recommended Books:

1. Fundamentals of Accounting & Financial Analysis: By Anil Chowdhry (Pearson Education)
2. Financial accounting: By Jane Reimers (Pearson Education)
3. Accounting Made Easy: By Rajesh Agarwal & R Srinivasan (Tata McGraw-Hill)
4. Financial Accounting for Management: By Amrish Gupta (Pearson Education)
5. Financial Accounting for Management: By Dr. S. N. Maheshwari (Vikas Publishing House).



ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR M.P.

BCA II YEAR

PAPER-VI COMPUTER ORIENTED NUMERICAL METHODS

Maximum Marks:40

Minimum Marks:14

Course Objective: The primary objective of this course is to make understand numerical computation which include linear equation, interpolation, and differential equation there by understanding the implementation of the numerical methods.

Course Outcome: Students will be able to use numerical methods for solving numerical problem, to get the accuracy, to assess the reliability of the numerical results, to determine the effect of round off error or loss of significance.

UNIT-I

Representation of Numbers- Integer Representation, Significant Digits, Floating point Representation, Errors in Computing. Roots of Nonlinear Equations: Bisection Method, False Position Method, Newton Raphson Method, Secant Method.

UNIT-II

Direct and Iterative Solution of Linear Equations: Basic Gauss Elimination Method, Gauss Jordan Method, LU Decomposition Method, Jacobi Iteration Method, Gauss Siedal Method.

UNIT-III

Curve Fitting: Lagrange Interpolation Polynomial, Newton Divided Difference Interpolation Polynomial, Newton-Gregory Forward Difference Formula, Newton-Gregory Backward Difference Formula.

UNIT-IV

Numerical Differentiation and Integration: Differentiating Tabulated Functions (First Derivatives of 3 point Forward, Backward and Central Difference formula), Differentiating Higher Order Derivatives (Second Derivatives of 3 point Forward, Backward and Central Difference formula). Newton-Cotes Methods - Trapezoidal rule(Simple and Composite), Simpson's 1/3 rule(Simple and Composite), Simpson's 3/8 rule, Higher Order Rules- Boole's rule.

UNIT-V

Numerical Solution of Ordinary Differential Equations: Taylor Series Method, Picard's Method, Runge-Kutta Methods- First Order, Second Order and Classical Fourth Order.

TEXT BOOK:

1. Numerical Methods by E Balaguruswamy
2. V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall, India.

REFERENCE BOOKS:

1. S. S. Sastry, Introductory Methods of Numerical Analysis.
2. M. K. Jain, S.R.K. Iyengar & R. K. Jain, Numerical Methods for Scientific and Engineering Computation.
3. H. C. Saxena, Finite Differences and Numerical Analysis.
4. Modes A., Numerical Analysis for Computer Science.
5. Numerical Analysis by Shastri
6. Computer based Numerical Algorithm by Krishnamurthy

